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## A NOTE FROM THE DIRECTOR OF THE RICHARD J. ROSENTHAL CENTER FOR REAL ESTATE STUDIES

It has been a little over a decade since the housing market collapsed, resulting in an economic recession, millions of home foreclosures, and a significant decline in homeownership. The housing market started recovering in 2012, but inadequate home-building has resulted in a severe lack of homes for sale and home prices that have increased nearly four times more than income growth. The homeownership rate has been improving, but only marginally, to 64 percent as of the end of the fourth quarter in 2017, well below the 69 percent rate in 2004.

This issue of the *Journal of the Center for Real Estate Studies* features studies that analyze the factors that led to the housing market's collapse, why homeownership remains depressed, and suggested solutions to increase access to affordable and sustained homeownership, especially among lower income groups.

In the first paper, *Single-family Rental: Measuring Rent Growth and Return*, Frank Nothaft discusses the estimation and uses of a single-family rent index (SFRI) based on CoreLogic repeat-transactions data. Many foreclosed homes were turned into one-family rental houses, with the number of single-family rentals increasing from 11.3 million in 2006 to 15.3 million in 2016. He shows that the SFRI moves ahead of the CPI-Shelter by 12 months. Using the index, the author also finds that the equilibrium vacancy rate for single-family rentals is about nine percent, and that on average, for each percentage point that vacancy rates are below equilibrium, rent growth is about one percentage point faster than inflation. Given the shortage of rental units nationally, with the most acute shortage in the Pacific coast areas (from Seattle to San Diego), additional rental units are needed to moderate rent growth in these cities. The index also provides a way to measure income returns on single-family rentals, which the author estimates at 3.3 percent in 2017.

In the second paper, *Responding to a Challenge: The Millennial Generation and Homeownership*, LaVaughn Henry looks at the income, saving, and debt patterns of millennials and how they are responding to the economic challenges confronting them. The author uses the U.S. Census Bureau definition of the millennial generation as adults born between 1981 and 2000. Using data from the 2016 Survey of Consumer Finances, the author finds that income levels for young adults 34 years old and under (a range that nicely matches the age of households headed by millennials) declined 18 percent between 2001 and 2013 and began a modest recovery only thereafter. For this age group, the homeownership rate dropped from a peak of 43 percent in 2004 to 36 percent in the fourth quarter of 2017. Homeownership is a major driver of wealth growth, so with the decline in homeownership and accumulation of student debt, the median net worth of young adults declined by 39 percent during the period 2004–2016. He concludes that student debt and the lack of affordable homes are the major challenges facing millennials. While the sustained economic recovery is helping millennials, the impending increases in interest rates, slow growth in new housing supply, and new limitations on federal tax deductions present challenges for millennials aspiring to become homeowners.

In the third paper, *Past, Current, and Future Housing Challenges in the United States*, Katrin Anacker presents the main key themes of the book *Introduction to Housing*, second edition, edited by Katrin B. Anacker, Andrew T. Carswell, Sarah D. Kirby, and Kenneth R. Tremblay. The paper provides a review of the federal intervention programs to assist the financial sector, stimulate economic growth, stabilize neighborhoods, and assist homeowners and stem foreclosures. The interventions amounted to at least \$1.5 trillion during 2008 through 2010, but with an estimated \$7 trillion to \$19.2 trillion of lost household wealth during 2007 through 2009, the author cites research that the response may have been “too little, too late, and too timid.” The paper cites the decreasing availability of affordable homes as a major challenge, with 16 percent of households spending more than 50 percent of income on housing in 2016, from only 12.6 percent in 2001. The paper emphasizes two solutions to increase the supply of affordable housing stock and the efficiency of use of the existing housing stock: universal design homes (homes that are adaptable for use throughout a person's lifetime) and accessory dwelling units (e.g., “granny flats”).

In the fourth paper, *Under the Radar: Real Estate Investment Beyond the Usual Suspects*, Hugh Kelly describes the factors that drive investments in the office and multifamily sectors, beyond the usual “urban vibrancy” metric. He looks at industry structure (measured by a location quotient), average employment growth and the standard deviation of annual employment change (volatility) as factors that can drive commercial and residential investments even in non-Tier I metro areas. Metro areas with a diversified economic structure captured the highest level of investment in 2015–2017 (New York, Boston, St. Louis, District of Columbia, Indianapolis, San Diego, Denver, Salt Lake City). Metros with a strong information/technology sector attracted the second largest volume of investments (Seattle, San Jose, San Francisco, Los Angeles, Portland, Nashville, Raleigh, Atlanta, and Austin). The author also finds that investors are willing to invest in low to moderate employment growth areas if they are diversified (Boston, New York, St. Louis) and in areas with greater employment volatility if they are in technology-dominant metros (San Jose, San Francisco, Los Angeles, Raleigh, Atlanta, Austin, Nashville). The author also finds the “low taxes are better” hypothesis to be unproven by the data. For example, high-tax areas such as the District of Columbia, New York, Connecticut, and Massachusetts rank highly in terms of commercial transaction volumes among 38 metros considered in the study.

In the fifth paper, *The Market for Manufactured Homes*, Gay Cororaton analyzes the role of manufactured homes as an affordable housing option. Excluding the cost of land, the average cost per square foot of manufactured homes is only about half the cost of new site-built single-family homes. She compares the housing cost associated with mortgage financing for manufactured homes on owned land, chattel financing for manufactured homes in a land-lease community, and mortgage financing for existing and new site-built homes sold with land. Because chattel financing is typically costlier compared to mortgage financing, owning a manufactured home and paying land rent in a land-lease community is costlier than owning a manufactured home sited on already owned land. However, if both the manufactured home and the land are financed, the land-lease option results in lower housing expenses. Older, multi-generational, and lower income households are more likely to reside in manufactured homes. Due to the federal regulations that have been enforced since 1976 and new design features, today’s manufactured homes are safer and more durable than the stigmatized mobile/trailer homes of the past.

I’d like to remind our readers that the mission of the Richard J. Rosenthal Center for Real Estate Studies is to seek out and produce studies that are of value to practitioners, so we will continue to emphasize practical and applied research from a variety of viewpoints. I hope you enjoy reading and learning from the papers in this latest volume.



Lawrence Yun, PhD  
Director, Richard J. Rosenthal Center for Real Estate Studies  
Senior Vice President, Research and Chief Economist,  
National Association of REALTORS®

# SINGLE-FAMILY RENTAL: MEASURING RENT GROWTH AND RETURN

**Frank E. Nothaft, PhD, CBE**

*Executive and Chief Economist, CoreLogic<sup>1</sup>*  
*fnothaft@corelogic.com*

## ABSTRACT

*The CoreLogic Single-Family Rent Index (SFRI) is a repeat-transaction rent index for single-family homes and is available monthly for the U.S., by major metros, and by rent tier. The index provides a superior measure of rent change faced by new single-family tenants. The index has several applications: more accurate rent growth and inflation measurement; analysis of the effect of vacancy on rent growth; generate a 'total return' metric for single-family rental; and an improved basis to model single-family rental security performance.*

**Keywords:** *repeat-transaction rent index, single-family rental, inflation, vacancy rates*

Single-family rental has been the fastest growing segment of the housing market over the last decade. Whether this continues will depend on demand and supply forces that affect the rate of return on single-family investments. Investment return is affected by home-price appreciation and revenue growth net of expenses. For this reason, it is important that real estate professionals understand rent and vacancy dynamics in their local market and how this may affect investment returns.

One-family rental houses, either detached or attached, have grown from 11.3 million in 2006 to 15.3 million in 2016, or from 17 percent to 23 percent of the one-family occupied stock. Compared with the overall rental market, today there are more tenants living in one-family houses than in traditional rental apartment buildings. In the decade ending 2016, the single-family renter-occupied stock grew by 35 percent, or about 3 percent per year, faster than any other segment of the housing market.<sup>2</sup>

The increase in the single-family rental stock occurred throughout the nation, although the largest increases occurred in large metropolitan areas and those areas that were particularly hard hit by the foreclosure crisis. As of 2016, there were thirteen metropolitan areas with at least

200,000 single-family rental homes. These areas accounted for more than one-fourth of the single-family rental stock in the nation and one-third of the increase since 2006. Aggregated across these thirteen areas, they experienced a 50 percent increase in their single-family rental stock during the 2006-2016 decade (Figure 1).

Much of the increase in the single-family rental stock was attributable to the housing market decline and Great Recession. During the decade ending 2016, more than 10 million home owners lost their homes through foreclosure or short sales. While some were sold to owner occupants, many more were purchased by investors including firms that specialized in single-family rental management. As of 2015, partnerships, corporations and real estate investment trusts (REITs) owned 17 percent of the single-family rental homes in the U.S. The largest owner category was still individual investors, owning four-in-five single-family homes (Figure 2).

Given the growth of the single-family rental stock, rent metrics are necessary to evaluate its performance. The rest of this paper discusses the CoreLogic Single-family Rent Index (SFRI), both its construction and applications.

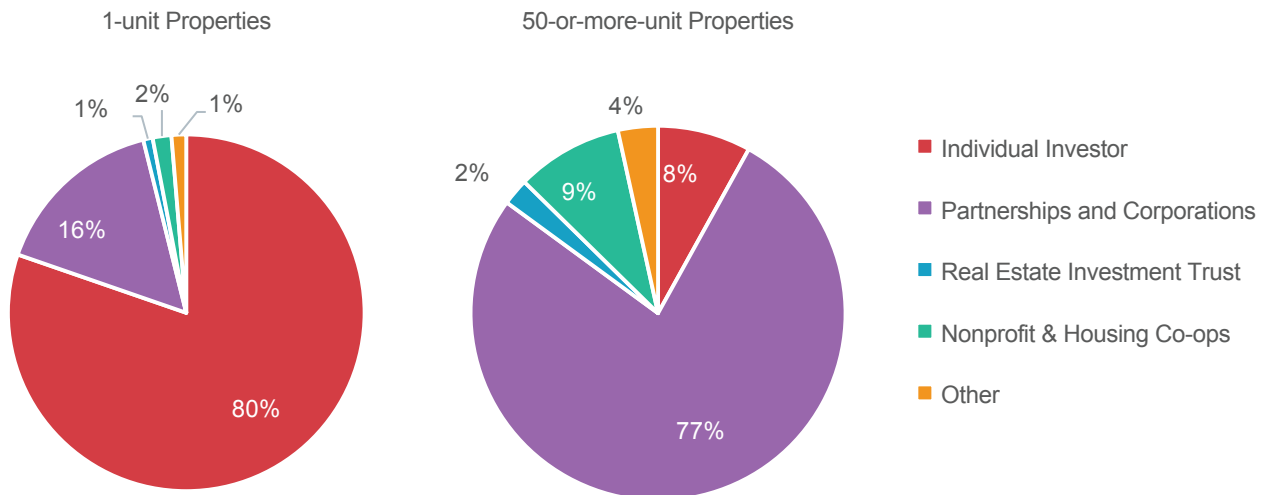
<sup>1</sup> The views expressed are those of the author and do not necessarily reflect the position of CoreLogic or its management.

<sup>2</sup> U.S. Census Bureau, *American Housing Survey for the U.S.: 2015*, reported that one-family houses (detached or attached) were 38 percent of the occupied rental stock; multifamily apartments (in buildings with five or more units) were 35 percent; two- to four-unit buildings were 16 percent; condominiums or cooperatives were 7 percent; and manufactured housing was 4 percent. U.S. Census Bureau, American Community Survey, was the source for the number of one-family detached or attached houses in 2006 and 2016 (Table C25032, "Tenure by units in structure").

Figure 1: Metropolitan Areas with at least 200,000 Single-family Rental (SFR) Homes in 2016<sup>3</sup>

Metropolitan Area	SFR Homes in 2016 (thousands)	Increase in SFR Homes 2006–2016 (thousands)	Percent Increase 2006–2016
Los Angeles–Long Beach–Anaheim	654	121	23
New York–Newark–Jersey City	389	108	38
Atlanta–Sandy Springs–Roswell	316	150	90
Dallas–Fort Worth–Arlington	310	120	63
Chicago–Naperville–Elgin	296	122	70
Houston–The Woodlands–Sugar Land	283	115	69
Philadelphia–Camden–Wilmington	274	61	29
Phoenix–Mesa–Scottsdale	269	124	86
Miami–Fort Lauderdale–West Palm Beach	260	94	57
Riverside–San Bernardino–Ontario	259	93	56
Detroit–Warren–Dearborn	241	92	61
Washington–Arlington–Alexandria	230	75	49
San Francisco–Oakland–Hayward	219	50	30
Sum: Metropolitan Areas with at least 200,000 SFR in 2016	4,003	1,326	50
United States	15,257	3,916	35
Above 13 Metropolitan Areas as a Share of United States SFR	26%	34%	

Figure 2: Rental Property Ownership<sup>4</sup>



3 U.S. Census Bureau, American Community Survey, Table C25032 (Tenure by units in structure), Renter-occupied units in 1-family detached or attached.

4 U.S. Department of Housing and Urban Development and U.S. Census Bureau, Rental Housing Finance Survey 2015 (Estate Trustees included in Individual Investor category)



## CORELOGIC SINGLE-FAMILY RENT INDEX (SFRI)

An ideal rent index would control for size (living space, lot size), location (commute, school quality), and various amenities (parking, fitness center, landscape). Further, it would measure the market rent paid by new tenants, rather than the market rent of all tenants, to judge changes in the current leasing market; the focus on new tenants is important because leases typically set a fixed rent for the term of the contract, thus a metric that included all tenants would be slow to reflect changing market conditions. In addition, separate indexes should be constructed for single-family and for multifamily rental homes because of the significant differences in structure type.

The CoreLogic SFRI uses observations on rent paid by subsequent tenants on the same home over time; by using repeat observations on the same property, the method can control for size, location, and amenities to directly measure rent change. Repeat-transactions indexes, such as the CoreLogic Case-Shiller Index and the CoreLogic Home Price Index, have been used to measure home-price change and the same methodology can be applied to rent to measure rent change.

The repeat-transaction method was introduced by Bailey, Nourse and Muth (1963) and improved by Case and Shiller (1987, 1989). The simplest formulation, applied to rent, specifies:

$$\ln R_{it_2} - \ln R_{it_1} = \sum_{t=0}^T \beta_t X_{it} + \varepsilon_i \quad (1)$$

where, for the  $i^{\text{th}}$  rental home,  $R_{it_1}$  is the rent paid by the (first) tenant beginning at  $t_1$ ,  $R_{it_2}$  is the rent paid by the subsequent tenant at  $t_2$ ,  $X_{it}$  equals -1 at  $t_1$ , 1 at  $t_2$  and zero otherwise, and  $\varepsilon_i$  is the error term. Case and Shiller observed that the error term was likely to be heteroscedastic (nonconstant variance), in part related to the difference between  $t_1$  and  $t_2$  across many repeat pairs. Thus, they proposed a weighted least squares procedure to control for heteroscedasticity in the estimation of (1). Ambrose, Coulson, Yoshida (2015) showed how to use this technique to create a rent index.

The above procedure generates an index that measures geometric mean growth rather than the arithmetic mean

growth; in general, because the geometric mean growth is bounded above by the arithmetic mean growth, the geometric mean will understate the arithmetic mean growth. Shiller (1991) provided an alternative formulation of (1) that allowed direct estimation of the arithmetic mean growth.<sup>5</sup> The reformulation, applied to rent, sets  $X_{it}$  equal to  $-R_{it_1}$  at  $t_1$ ,  $R_{it_2}$  at  $t_2$  and zero otherwise, and sets the dependent variable to  $R_{it_1}$ . The SFRI is constructed using this arithmetic repeat-transaction method and estimated by weighted least squares, applied to single-family rent pairs.

CoreLogic Multiple Listing Service (MLS) data were used to create matched pairs. Many local Realtor® Boards include single-family rental listings in their MLS. When rentals are included in an MLS, the data contain rented date, rent amount, property address and other property characteristics. The rental listings used to construct the CoreLogic SFRI include detached and attached single-family houses and condominiums. Additional details on the construction of the CoreLogic SFRI are contained in Chen and Boesel (2016).

In metropolitan areas with a large number of repeat pairs, the single-family rental homes can be grouped into 'tiers' based on their rent relative to the median rent for single-family homes in the metropolitan area. The CoreLogic SFRI uses four tiers: The low tier (tier 1) is 75 percent or less of the median rent, the low-to-middle tier (tier 2) is more than 75 and up to 100 percent of the median rent, the middle-to-moderate tier (tier 3) is more than 100 and up to 125 percent of the median rent and the high tier (tier 4) is greater than 125 percent of the median rent.

A national CoreLogic SFRI can be constructed as a weighted average of metropolitan areas. Recent values of the national index are created as a weighted average of the SFRI for 40 Core-Based Statistical Areas (CBSAs), where the weight for each CBSA is based on the aggregate value of the metropolitan area's rental stock, which is calculated as the median contract rent multiplied by number of rental homes from the American Community Survey.<sup>6</sup> Likewise, a national SFRI by each of the four tiers is constructed by the same method.

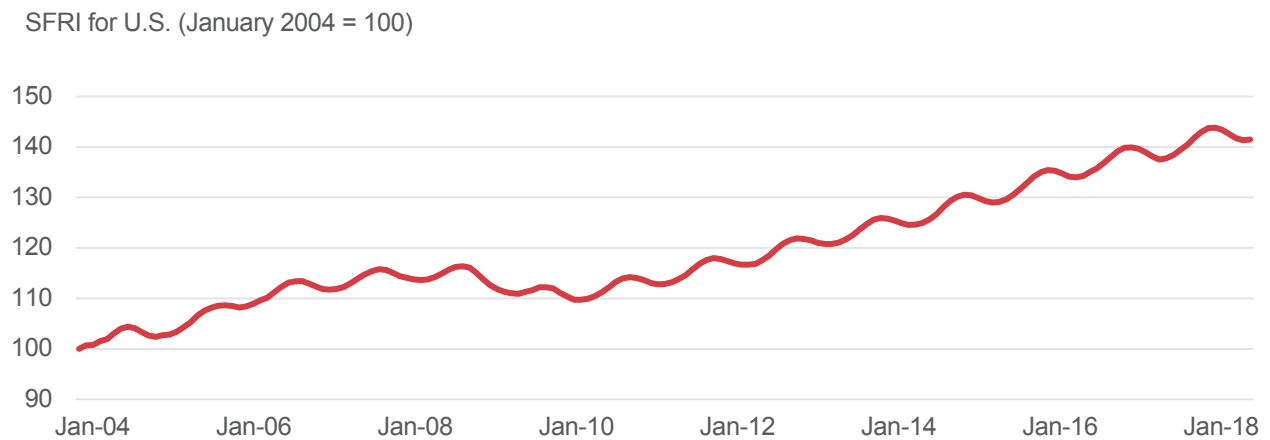
5 Goetzmann (1992) proposed a transformation to adjust geometric growth rates. For additional discussion of estimation of repeat-transaction indexes, see Wang and Zorn (1997), Dreiman and Pennington-Cross (2004), and S&P Dow Jones Indices (2017).

6 The U.S. Office of Management and Budget defines CBSAs to provide a nationally consistent set of geographic entities for the United States and Puerto Rico for use in tabulating and presenting statistical data. CBSAs became effective in 2003 and refers collectively to metropolitan statistical areas and micropolitan statistical areas. [https://www.census.gov/geo/reference/gtc/gtc\\_cbsa.html](https://www.census.gov/geo/reference/gtc/gtc_cbsa.html)

The resulting national SFRI has several notable features (Figure 3). First, it exhibits a strong seasonal effect, with rents generally higher in the summer and lower in the winter. Second, rents fell during the Great Recession as household formations slowed and housing demand weakened. Third, the rental market rebounded before the home

sales market, as single-family rents had pierced their August 2008 peak by 2011 whereas national home price indexes have returned to their pre-Great Recession peaks only in the past year. Fourth, single-family rents were 24 percent above their 2008 peak nine years later in nominal terms, and about 16 percent higher after adjusting for inflation.<sup>7</sup>

Figure 3: Single-family Rental Index for the U.S.<sup>8</sup>



### APPLICATIONS OF THE CORELOGIC SFRI

There are several applications of the CoreLogic SFRI that improve our understanding of the performance of the single-family rental market. This paper discusses four applications of the SFRI:

- More accurate rent growth and inflation measurement

- Analysis of effect of vacancy on rent growth
- Generate a ‘total return’ metric for single-family rental
- Improved basis to model single-family rental security performance

### MORE ACCURATE RENT GROWTH AND INFLATION MEASUREMENT

SFRI is the only index that exclusively measures rent growth for single-family homes; measures of multifamily apartment rents introduce ‘basis’ risk in the sense that multifamily rents may be growing at a different pace than single-family rents. Further, the SFRI captures current market rent because it relies on the rents paid by new tenants. The Bureau of Labor Statistics’ Consumer Price Index (CPI) includes a rent subindex, which incorporates information on both single- and multifamily rental homes. However, the CPI collects data on all current tenants, not exclusively

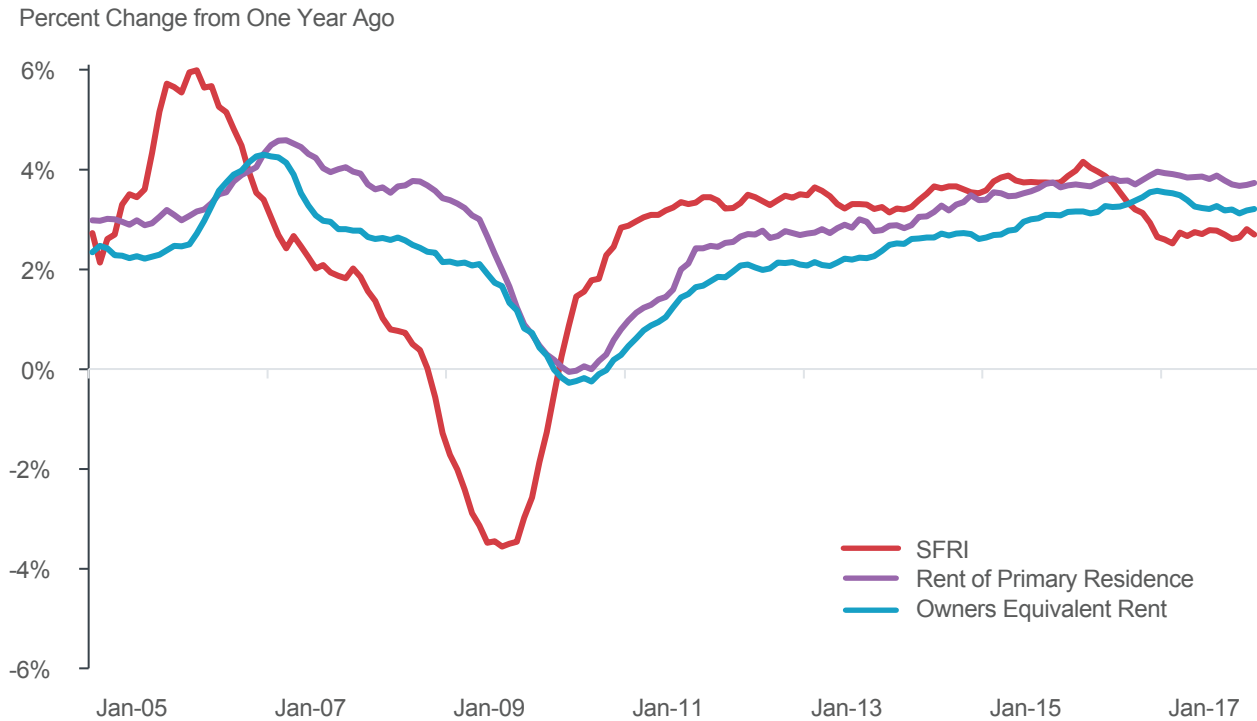
new tenants. Because rental homes often have a lease that fixes monthly rent for a term (commonly one year), that means that the CPI rent measurement will catch changes in market conditions with a lag and will also tend to be smoother over time.<sup>9</sup> A lag of approximately one year is evident in a comparison of the 12-month percent change in the SFRI and the CPI rent metrics (Figure 4).

7 The Bureau of Labor Statistics Consumer Price Index less Shelter increased 8 percent between August 2008 and August 2017.

8 CoreLogic Single-family Rental Index

9 Bureau of Labor Statistics (2015) provides additional information on the construction of the CPI residential rent index. The lag with actual market conditions is discussed in Ambrose, Coulson, and Yoshida (2014, pp. 2, 10) and in Crone, Nakamura, and Voith (2006).

Figure 4: SFRI Uses Rent of New Tenants; CPI Rent Indexes Exhibit a 12-Month Lag<sup>10</sup>



The lag in the CPI response to changes in market rent is important because residential rent comprises 31 percent of the CPI and because the CPI is an important measure of inflation for policy makers and macroeconomic forecasters.<sup>11</sup> Thus, the CPI can overstate or understate actual inflation because of its use of average rent paid by all tenants rather than the market rent paid by new tenants.

...CoreLogic [SFRI] utilizes an approach that mirrors the S&P/Case-Shiller house price index. This approach measures current market prices by using only new leases, and controls for housing quality by tracking the same

units over time...[T]his results in a measure of inflation for owner-occupied housing that fell much faster during the recession than the BLS measure. In October 2009, at the peak of unemployment, the CPI measure of housing inflation grew 1.2% year to year, while the CoreLogic measure was down 3.2%. This has big implications for core inflation, since owner-occupied housing is a big component of it. If the BLS had been using this method, when unemployment peaked at 10% in October 2009, core inflation would have been 0.5% instead of 1.7%.<sup>12</sup>

### ANALYSIS OF THE EFFECT OF VACANCY ON RENT GROWTH

The dynamics between rental vacancy rates and rent growth can be explored by estimating the equilibrium or “natural” vacancy rate. The equilibrium vacancy rate reflects a balance between demand and supply of rental homes that leaves inflation-adjusted rent unchanged; in other words,

the natural vacancy rate is defined as the rate consistent with zero real rent growth. A version of this relationship proposed by Rosen and Smith (1983) is  $\Delta R_t = g(V_n - V_t)$  where  $\Delta R_t$  denotes real rent growth,  $V_n$  the equilibrium (or “natural”) vacancy rate,  $V_t$  the actual vacancy rate, and  $g$

<sup>10</sup> CoreLogic Single-family Rental Index, Bureau of Labor Statistics CPI (through January 2018)

<sup>11</sup> Rent of primary residence and owners’ equivalent rent of residences comprise 31 percent of the CPI. <https://www.bls.gov/news.release/cpi.t01.htm>

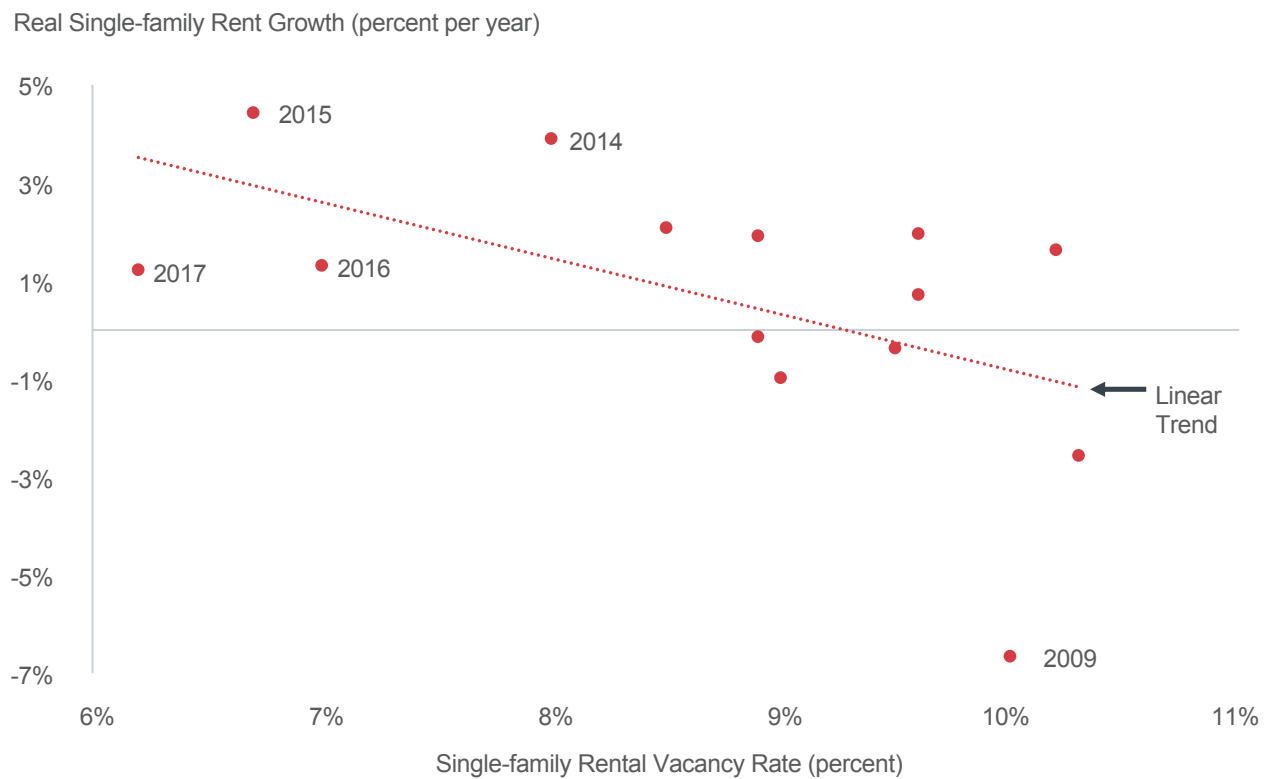
<sup>12</sup> Ozimek (2016). <https://www.economy.com/dismal/analysis/datapoints/284051/Why-Inflation-Didnt-Slow-Much-During-the-Great-Recession/>

the speed at which real rent growth responds to deviations of actual vacancy from the natural rate. Assuming the natural vacancy rate and adjustment speed are constant, then a regression model can be specified as:

$$\ln R_{t+1} - \ln R_t = \beta_0 + \beta_1 V_t + \varepsilon_t \quad (2)$$

where  $\beta_1 = -g$  and  $\beta_0 = gV_n$ ; hence,  $V_n = -\beta_0/\beta_1$ . Deflating the CoreLogic SFRI by the CPI less shelter (to purge the overall CPI from the effect of residential rent, those approximating a comparison of change in rent against the change in price of all other consumer goods) creates a measure of real rent. A close approximation to single-family vacancy rates is the Census Bureau's Housing Vacancy Survey (HVS) one-unit vacancy rate data. (Figure 5).

Figure 5: Rent Growth Faster in Years with Low Vacancy<sup>13</sup>



Estimating equation (2) during the last 14 years provides an estimate for the equilibrium vacancy rate for single-family rental of about 9 percent, meaning that when the vacancy rate was below this level rents were rising faster than other consumer prices.<sup>14</sup> And when vacancy rates were above 9 percent, rent growth was slower than inflation in other consumer goods. To illustrate, as single-family vacancy rates

have declined since 2014 to their lowest level in nearly 20 years, rents have grown nearly 3 percentage points faster than other consumer prices. On average, for each percentage point that vacancy rates were below equilibrium, rent growth was about one percentage point faster than inflation.

The relationship between lower vacancy rate and higher rent growth is also evident when looking across metropolitan

13 CoreLogic Single-family Rental Index, Bureau of Labor Statistics Consumer Price Index less Shelter, U.S. Census Bureau Housing Vacancy Survey for fourth quarter of prior year (Table 3); line represents a univariate regression

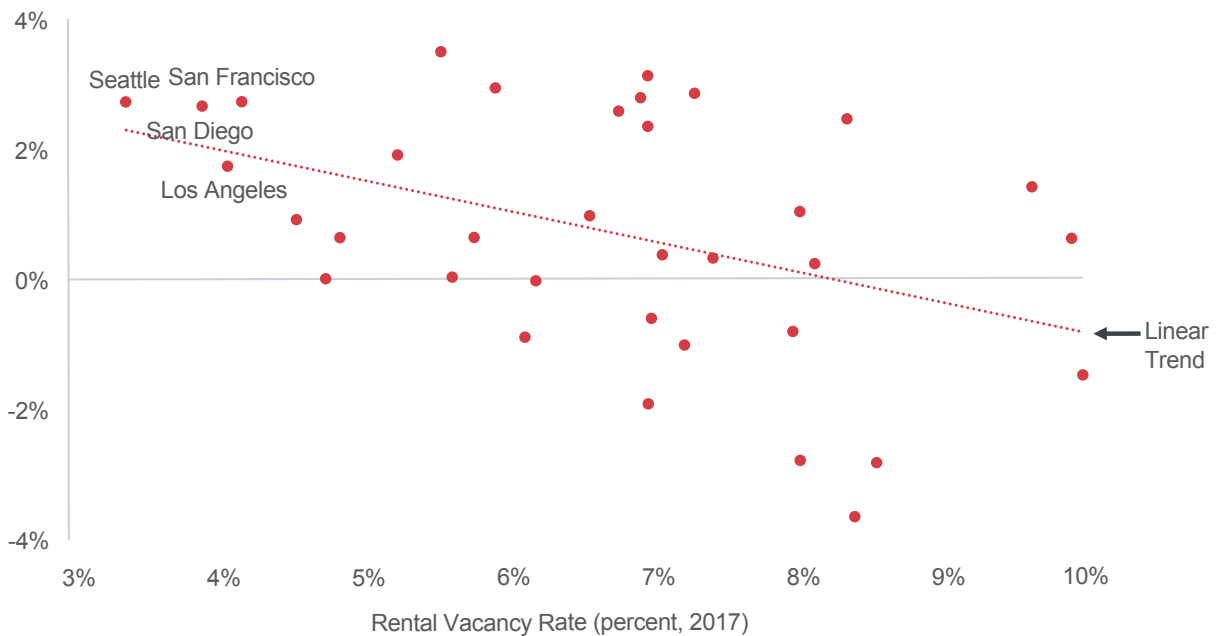
14 The HVS one-unit measure includes manufactured housing in addition to one-family detached and attached houses; because rental vacancy rates are higher for manufactured housing than for one-family houses, the HVS measure overstates the vacancy rate on single-family rental. Thus, a single-family vacancy rate time series that excludes manufactured housing would result in an estimated natural vacancy rate that is lower than one estimated with the HVS series.

areas. Instead of estimating equation (2) over time, the equation can also be estimated with, say, a cross-section of metropolitan areas, as in Gabriel and Nothaft (1988, 2001). Because the HVS does not report vacancy rates for one-unit homes by CBSA, the vacancy rate for the entire rental market by CBSA was used (Figure 6). Locales that had low vacancy rates, reflecting the limited amount of

rental inventory relative to families looking for homes, also had faster rent growth. The shortage appeared to be particularly acute in high-cost cities along the Pacific coast, running from Seattle down to San Diego. Because of the dynamics between vacancy and rent, additional rental supply is necessary to moderate rent growth in cities with limited vacant inventory.

Figure 6: Rent Growth Faster in Low-Vacancy Metro Areas<sup>15</sup>

Real Rent Growth (percent, 2016Q4 to 2017Q4)



With rental vacancy rates at their lowest level since 1985, and below the “natural” rate, the time series and cross-sectional analysis both imply that we should expect single-family rents will continue to rise about 2½ to 3 percent in the

national index during 2017, outpacing inflation, with faster growth in tight, low-vacancy metros and slower growth in high-vacancy markets.<sup>16</sup>

### GENERATE A TOTAL RETURN METRIC FOR SINGLE-FAMILY RENTAL

A total return measure is necessary to compare alternative investments. For real estate, the total return includes two components: the capital appreciation and income return. Capital appreciation measures the value growth of the asset net of capital expenditures and income return measures the

net income (rent revenue net of operating expenses) relative to property value.

The CoreLogic HPI and SFRI, supplementing data from the 2015 Rental Housing Finance Survey, can be used to

<sup>15</sup> CoreLogic Single-family Rental Index, Bureau of Labor Statistics Consumer Price Index less Shelter, U.S. Census Bureau Housing Vacancy Survey (Table 4), 35 metropolitan areas; line represents a univariate regression

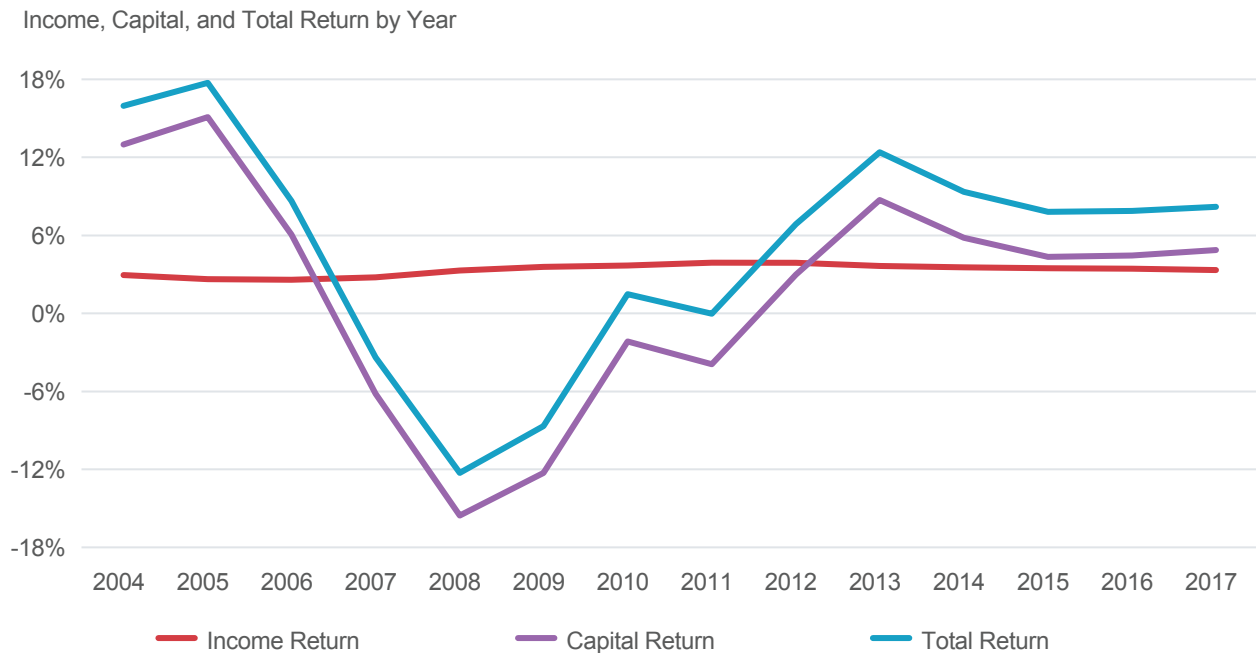
<sup>16</sup> The HVS reported the average rental vacancy rate in 2016 was 6.9 percent, the lowest annual average since 6.5 percent in 1985. In 2017 the HVS vacancy rate edged up to 7.2 percent.

illustrate the calculation for single-family rental homes.<sup>17</sup> The resulting calculation for one-family homes in the U.S. yielded capital appreciation of about 4.9 percent and an income return of about 3.3 percent for the 2017, or a total annual return of about 8.2 percent. In comparison, the National Council of Real Estate Investment Fiduciaries (NCREIF) reported 1.8 percent capital appreciation, 4.4 percent income return, and 6.2 percent total return on rental apartment buildings for 2017.<sup>18</sup> Strong appreciation

for single-family homes during the year supported a higher capital return.

Figure 7 illustrates this calculation over time for single-family rental in the U.S. There were wide swings on an annual basis primarily driven by home-price appreciation and depreciation. On average, single-family rental had an estimated total return of 5 percent per year for 2004 through 2017.

*Figure 7: Single-family Rental Total Return Averaged 5% per year during 2004 to 2017<sup>19</sup>*



### IMPROVED BASIS FOR SINGLE-FAMILY RENTAL SECURITIES

Using multifamily rental apartment metrics to value single-family rental securities exposes investors to model error from basis risk. Basis risk refers to the risk that risk or return measure for an asset serves as an imperfect measure for the asset under valuation. In other words, multifamily apartment rents may be viewed as a good proxy for single-family rents; however, if apartment building rents perform differently from single-family rents, then the use of the former

to value single-family rental can either over- or under-value single-family rental securities.

The Single-family rental index reduces basis risk for valuing single-family rental securities since it reflects a direct measure of revenue growth for this asset class. Less basis risk would improve valuations.

<sup>17</sup> See Appendix.

<sup>18</sup> See <https://www.ncreif.org/data-products/property/>.

<sup>19</sup> CoreLogic (see Appendix)

## SUMMARY

The CoreLogic Single-family Rent Index is the only index that exclusively covers single-family rental homes, is available monthly for more than 70 CBSAs, and is constructed with a repeat-transactions methodology. By providing a direct measurement of rent growth for newly rented homes, it is an improvement over existing metrics which either cover the entire rental market (thus, identify changes in market rent with a lag because of leases) or cover only rental apartment buildings (thus, have basis risk when used for comparison to single-family).

The SFRI is an approach that, if it was incorporated into the CPI, would result in an improved measure of current inflation that consumers face. The SFRI, supplemented with local home vacancy data, would improve rent-offer decisions by investors. The index could also be used within a total return metric for the single-family rental asset class and improve valuations of single-family rental securities by reducing or eliminating basis risk in valuations.

## APPENDIX: TOTAL RETURN CALCULATION FOR SINGLE-FAMILY RENTAL

The 2015 Rental Housing Finance Survey (RHFS) collected rental income, operating expense, capital improvement spending, and property value for rental homes during the prior year. The one-unit data includes information on single-family detached, single-family attached, and manufactured housing.

The RHFS reported an average annual residential rent of \$10,453, average annual operating expenses of \$4,693, and an average home value of \$162,950; thus, the income return for 2014 was 3.5 percent (= \$5,760 net income divided by \$162,950 market value). The CoreLogic SFRI annual percent change for the U.S. was used to backcast net income from 2014 to 2004 and to project net income from 2014 to 2017; this calculation assumes that both rental income and operating expense grew at the same rate. The CoreLogic HPI annual percent change for the U.S. was applied to the 2014 RHFS value to estimate the property value from 2013 to 2004 and from 2015 to 2017. The resulting calculation resulted in a 3.3 percent income return for 2017.

A capital improvement in the RHFS is described as “The addition of a permanent structural improvement, or the restoration of some aspect of a rental property, that will either enhance the rental property’s overall value or increase

its useful life.”<sup>20</sup> There was a wide variation in capital improvement spending on one-unit homes reported in the 2015 RHFS. Approximately one-half of the properties with reported data had no capital improvement spending, and some had more than \$200,000 in improvements. Home-price indexes generally identify and effectively remove properties that have had extensive improvements. Nonetheless, properties with smaller amounts of capital improvements likely enter index calculations. Thus, to estimate the sensitivity of capital appreciation for different levels of capital expenditures, RHFS data for capital improvements of less than \$5000, and for improvements of less than \$20,000, were examined. If the dollar value of capital improvements were additive to property value, then the expenditures could have added 0.6 to 1.1 percent to the increase in property value. Thus, assuming the same rate of capital expenditures during 2017, the CoreLogic HPI growth rate for the U.S. (calculated as annual average for 2017 divided by annual average for 2016), less one percentage point, was computed to estimate capital appreciation, resulting in a 4.9 percent estimate for capital return. A similar calculation was used for other years to create the 2004 to 2017 annual series.

Total return was the sum of income return and capital return, or an estimated 8.2 percent for 2017.

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# RESPONDING TO A CHALLENGE: THE MILLENNIAL GENERATION AND HOMEOWNERSHIP

**LaVaughn M. Henry, PhD, CBE**

*Banking and Regulatory Policy Analyst, Federal Deposit Insurance Corporation<sup>1</sup>  
lavaughn.henry@gmail.com*

## ABSTRACT

*The “Millennial Generation”, persons based on U.S. Census estimates who are born between 1981 and 2000, represent the largest single generation in U.S. history. For their size alone, their potential impact on the future housing market is substantial. But have they been acting in accordance with previous generations’ homebuying patterns? Early evidence says that, for a wide variety of reasons, they previously have not, but recent evidence seems to demonstrate that they may be coming around to the American Dream of Homeownership. This article looks at recent trends in the income, savings, and debt patterns of these millennials, and what this has meant for their homebuying patterns in the wake of the Great Recession of 2007–2009. The data shows that despite myriad economic and structural challenges uniquely facing the country’s largest generation, they remain committed to becoming future homeowners. However, their path to homeownership remains a challenging one.*

**Keywords:** Homeownership, Millennials, Great Recession

The American Dream of Homeownership is one that has spanned the generations. Owning one’s own home, being a permanent part of a community, and raising the next generation of homeowners harkens back to the very beginnings of America. However, the bursting of the housing bubble in 2006–2008, the delayed recovery starting in 2012, and the rapid increase in house prices amid tight supply and slow

income growth have possibly caused many in the nation’s largest generation, the “Millennial Generation,” to see their dream of homeownership as a dream deferred. This article looks at how these and other economic events affected this key generation’s income, saving, and debt patterns, and how they responded to the unique challenges facing them in today’s housing market.

## WHO ARE THE MILLENNIALS?

As any demographer knows, defining the beginning and endpoints of a generation is far from an exact science. The baby boomer generation, until recently the largest generation in contemporary America, is the last generation with generally agreed upon start and end years of 1946 and 1964, respectively. The cutoff points for the succeeding generations are less agreed upon. However, using the definition of the U.S. Census Bureau as the arbiter for this work, the millennial generation covers all young adults born between 1981 and 2000. As of 2015, persons in that age group accounted for approximately 25 percent, or 83.1 million, of the U.S. population. Their size even exceeded that of the 75.4 million baby boomers, making their potential

economic clout and impact on the economy, and more specifically the housing market, significant and growing. According to the National Association of Realtors® (NAR) 2018 Home Buyer and Seller Generational Trends Report, these young adults aged 37 years and younger account for the largest share of home buyers at 36 percent.

In contrast to their parents, the baby boomers, they are much more diverse, with 44.2 percent being part of a minority race or ethnic group. However, like their parents who entered the economy in the turbulent 1960s and ‘70s, they came of age and began to enter the workforce during a period of great economic and social upheaval. Consider that the oldest members of the generation were met on their

<sup>1</sup> The views in the paper are the author’s and not represent the views or official position of the Federal Deposit Insurance Corporation.

20th birthdays with the terrorist attacks of 2001, followed by the Iraq and Afghanistan Wars, the Great Recession of 2007–2009, the 2008–2009 financial crisis, and the first national collapse in house prices that led to record foreclosures and declines in homeowner wealth. Enduring an

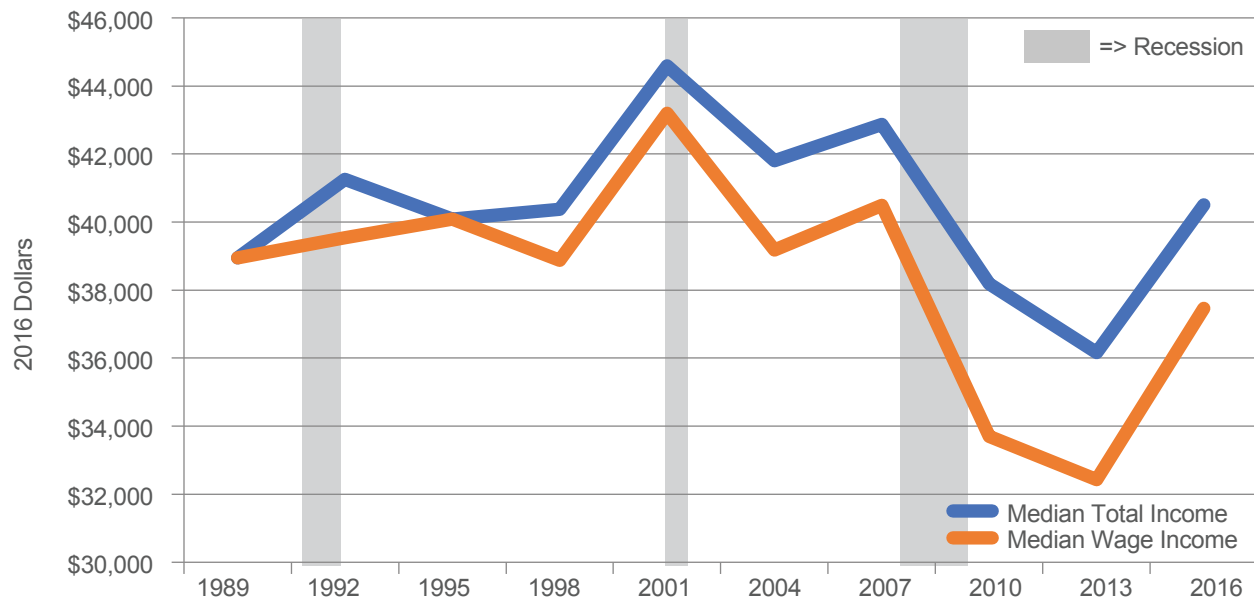
extended period of slow economic recovery and unemployment rates for young adults aged 25 to 34 years that reached as high as 12 percent during 2009–2012, the ability of the millennials to launch their pursuit of the dream of homeownership was significantly impaired.

### TRENDS IN MILLENNIALS’ INCOME, WEALTH, AND DEBT

Against this backdrop, the economic fortunes of the millennials suffered and began to recover significantly only recently. Using data from the Federal Reserve Board’s 2016 Survey of Consumer Finances (SCF), the causes for deferred homeownership for these young adults becomes quite clear. After increasing strongly throughout the 1990s, median real total income levels for young adults declined significantly since the 2001 peak (Figure 1). The SCF measure of total income includes not only wages and salaries, but also forms such as, but not limited to, self-employment

and business income, taxable and tax-exempt interest, dividends, realized capital gains, food stamps and other support programs provided by the government. Using this measure, income levels for young adults declined 18 percent between the 2001 and 2013 survey years and did not begin any significant recovery to 1990 levels until the 2013–2016 period. For wage income only, the decline was even greater, 25 percent between 2001–2013, followed by a similar pattern of improvement during 2013–2016.

Figure 1: Real Median Income Levels for Young Adults Aged 18–34<sup>2</sup>

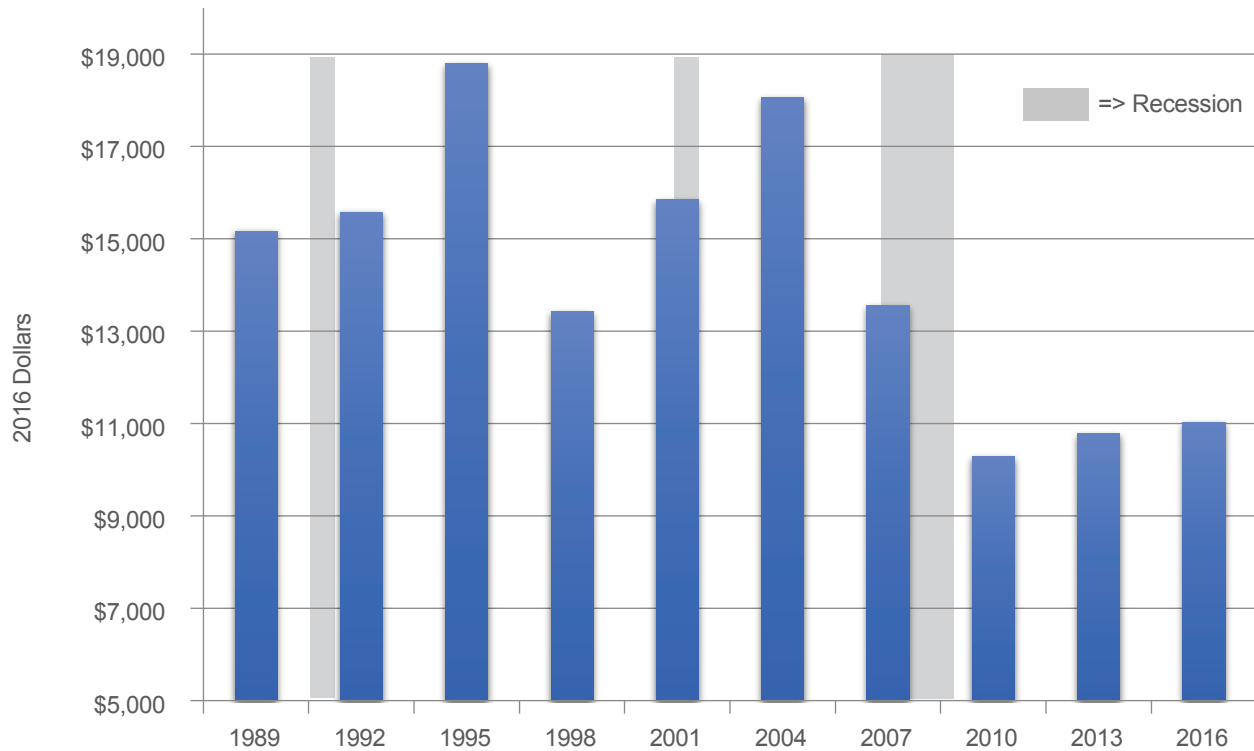


In response to the decline in real income, the median net worth for young adults also declined by 39 percent during the period 2004–2016 (Figure 2). Greater levels of net worth liberate an individual to expand his consumption and more likely to engage in making larger purchases, such as a home. Likewise, significant and persistent declines in net worth have a depressing effect on the individual’s

consumption pattern. Based on the 2016 SCF survey, this pattern held during the period of the downturn, and only recently, with the continued improvement in the labor market, has there been a measurable increase in the number of young people saving to buy homes.

2 Federal Reserve Board Survey of Consumer Finances, 2016

Figure 2: Real Median Net Worth for Young Adults Aged 18-34<sup>3</sup>



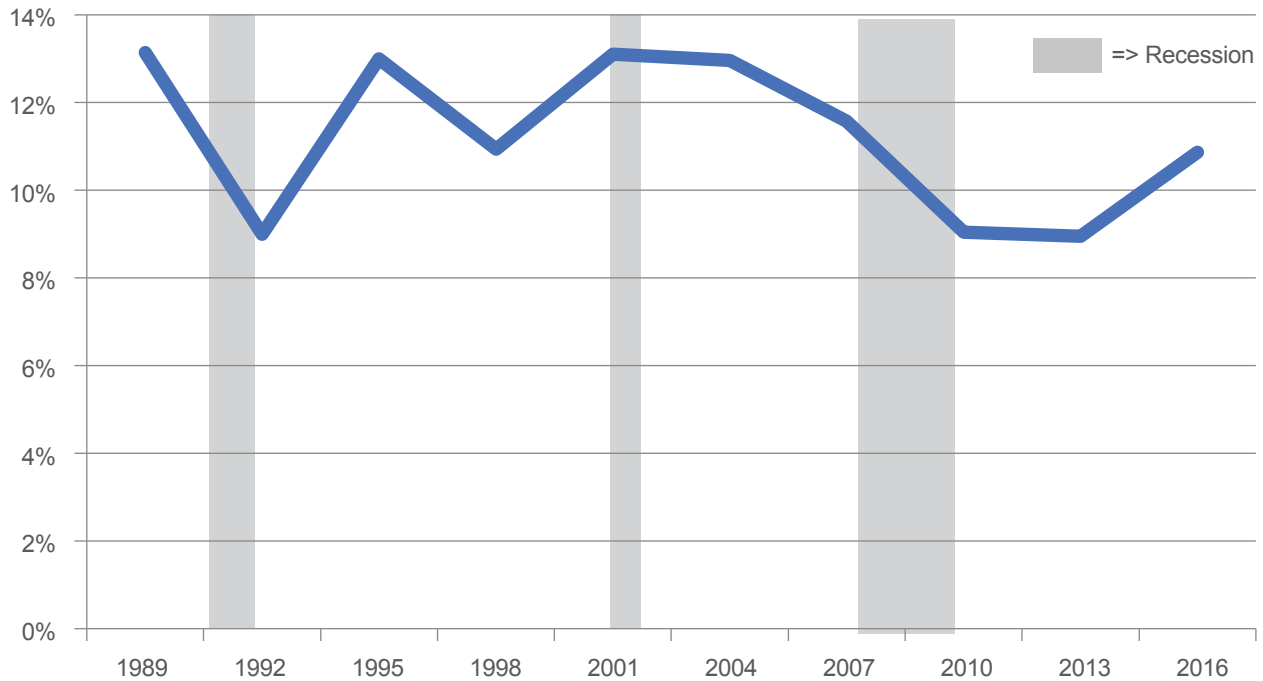
Given the economic collapse and slow recovery of the 2000s, young adults, rightly so, have been slow to change their sentiment with respect to owning homes. According to the 2016 SCF, the percent of young adults that stated that they were saving to buy a home had recovered to approximately 11 percent by 2016, up from a low of nine percent in 2013. However, this still was substantially below the 13 percent level that existed at the peak of the housing market in 2004.

It is important, however, to recognize that data trends seem to indicate that the millennials, America's largest cohort of

homebuyers, like the generations before them, want to buy homes, but due to significant affordability issues, student debt, and income issues, they are having a hard time saving for a home (Figure 3). NAR's 2018 Generational Trends report also found that for buyers 37 years and younger, 25 percent of respondents stated that saving for a down payment was the most difficult step in the home buying process. Forty six percent of this cohort reported having student loan debt with a median amount of \$27,000. This burden has been growing for the millennials since the turn of the century and, for some, represents a significant impediment on their lifestyle and consumption choices.

3 Federal Reserve Board Survey of Consumer Finances, 2016

Figure 3: Percentage of Young Adults Saving for the Purchase of their First Home<sup>4</sup>



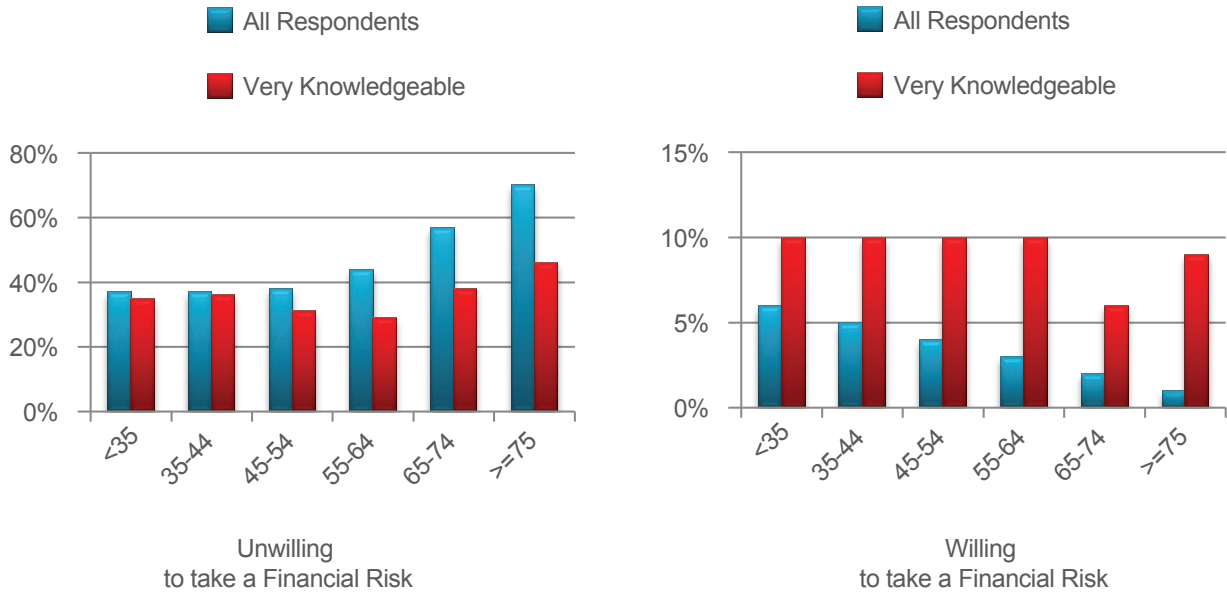
According to a 2017 study by the NAR and the nonprofit America Student Assistance agency, student loan debt is delaying homeownership for millennials by an estimated seven years.<sup>5</sup> Twenty-two percent were delayed by at least two years in moving out of a family member’s home after college due to their student loans. Additionally, while the magnitude of the debt is a challenge (Figure 4), millennials’

credit situations may also be impaired as the number of student loan holders defaulting, or requesting a forbearance of the payments, continues to increase. The survey also found that among borrowers who said student loan debt delayed buying a home, 35 percent had defaulted or forbore on their debt.

<sup>4</sup> Federal Reserve Board Survey of Consumer Finances, 2016

<sup>5</sup> National Association of REALTORS® and American Student Assistance, Student Loan Debt and Housing Report 2017: When Debt Holds You Back, <https://www.nar.realtor/research-and-statistics/research-reports/student-loan-debt-and-housing-report>

Figure 4: Young Adults Willingness to take a Financial Risk<sup>6</sup>



**HOUSING AFFORDABILITY REMAINS A CHALLENGE**

At the end of the day though, it all comes down to affordability. Can the potential millennial first time homebuyer afford to make the switch from renting, or even staying with their parents, to the long-term purchase relationship of homeownership? Can the prospective homeowner afford the financial responsibility of owning a home?

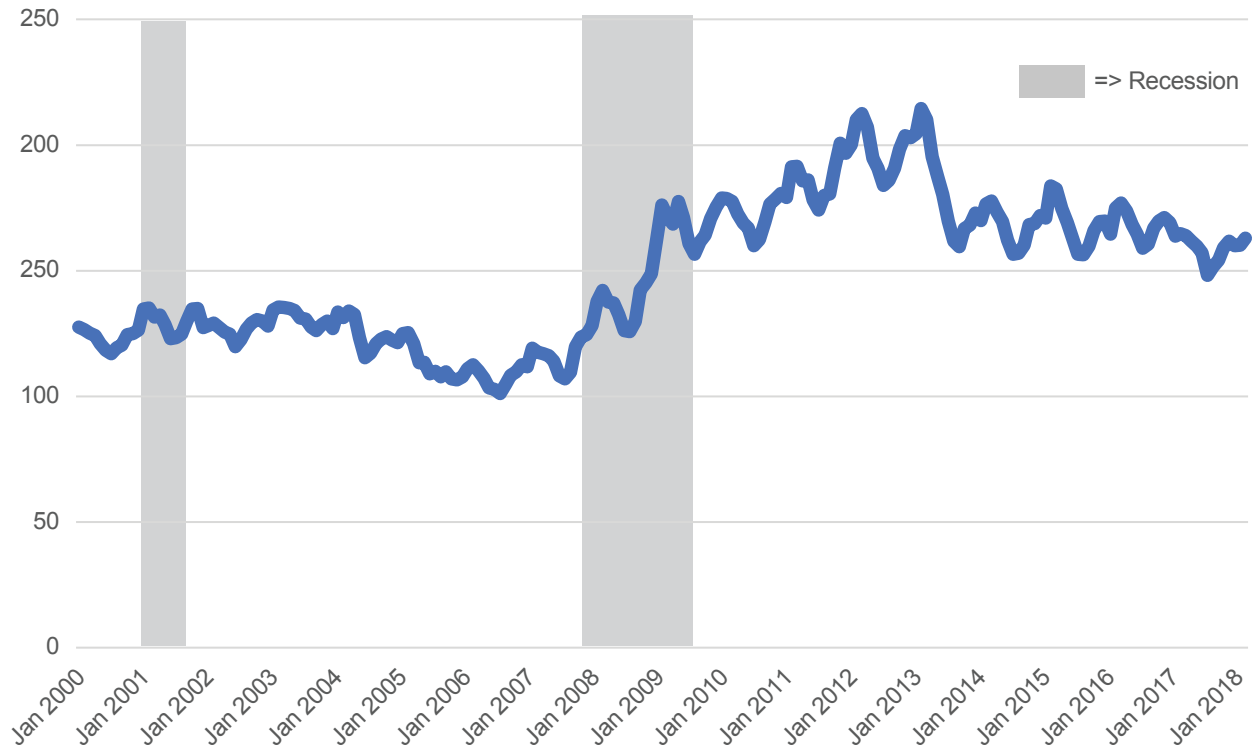
By any measure, homeowner affordability has declined significantly since the record levels of 2012 and 2013. According to NAR’s Housing Affordability Index, housing affordability peaked in January 2013 at approximately

214.5<sup>7</sup> (Figure 5). The most recent reading for the index, dated January 2018, stood at 163. This means that, on average, housing affordability has declined for all potential homebuyers by approximately 25 percent. When considering the significant issues already facing millennial homebuyers, this is a significant move. However, it should be noted that this is an average measure. It does vary greatly by region of the country. Affordability is most challenging along the coasts and in central cities, while some selected Midwestern and Southern metropolitan areas continue to offer relatively affordable opportunities.

<sup>6</sup> Federal Reserve Board Survey of Consumer Finances, 2016

<sup>7</sup> NAR’s Housing Affordability Index measures whether or not a typical family earns enough income to qualify for a mortgage loan on a typical home at the national and regional levels based on the most recent price and income data. To interpret the indices, a value of 100 means that a family with the median income has exactly enough income to qualify for a mortgage on a median-priced home. An index above 100 signifies that family earning the median income has more than enough income to qualify for a mortgage loan on a median-priced home, assuming a 20 percent down payment.

Figure 5: NAR Home Affordability Index<sup>8</sup>



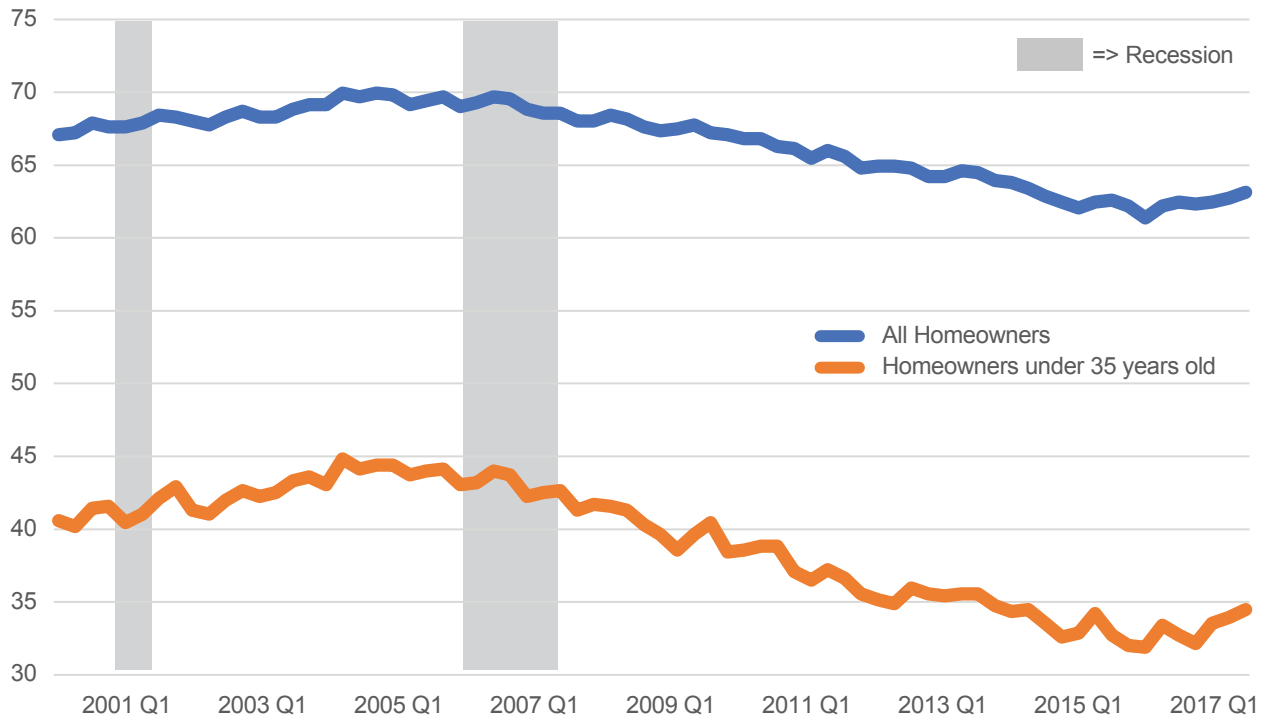
### TRENDS IN HOMEOWNERSHIP RATES

While they were not unique, homeownership rates for millennials suffered greatly after the collapse of the housing bubble in 2007 (Figure 6). Across all generations, according to the U.S. Census Bureau, the homeownership rate averaged 64.2 percent. It peaked in 2004 at 69.2 percent. However, as any statistician can tell you, averages can be deceiving. This five-percentage point decline was not shared equally across all demographic groups. While the average fell by five points, the average for persons aged 34 and younger peaked at approximately 43 percent in 2004 and declined to approximately 36 percent in the fourth quarter of 2017—a seven percentage point decline. The degree

of this significant decline reflects not only the impact of weak economic conditions on a young home-buying demographic, but possibly also a shift in preferences due to societal change. As many observers have noted, millennials preference for urban living in large metropolitan areas has been evidenced. However, coincident with this has been a significant increase in the cost of rent and other associated costs. So, the question becomes, because of these significant changes in income/wealth levels, affordability, and rental costs, are we at a turning point for millennials’ homeownership decisions? And, if so, in what direction?

<sup>8</sup> National Association of Realtors®

Figure 6: Homeownership Rates<sup>9</sup>



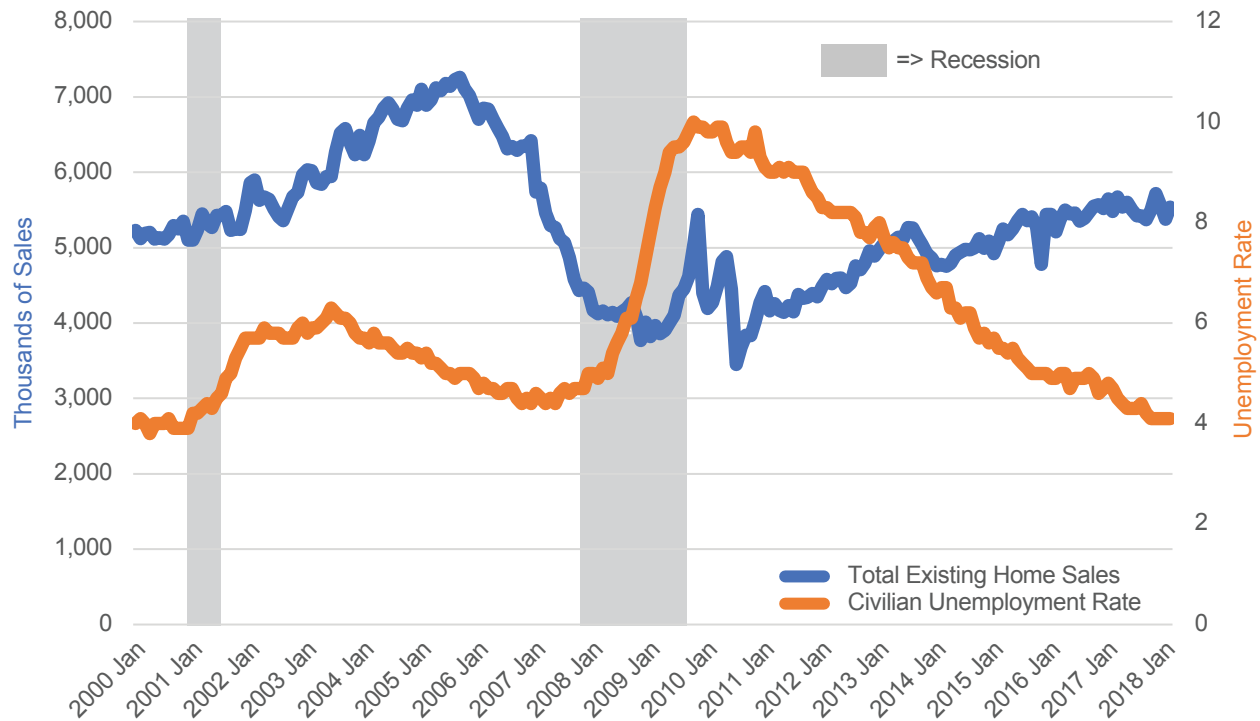
### AN EXPANDING ECONOMY DOESN'T HURT

The American economy is on tear. The recovery began in earnest in 2012, and despite a few slow quarters, has continued apace since that time. In fact, for various reasons, it has accelerated since early 2017. The impact of this six years of recovery on the housing market cannot be overstated.

Existing home sales, according to the NAR, are currently running at a rate of approximately 5.5 million per year (Figure 7). That is approximately 34 percent higher than it was at the depth of the Great Recession in 2008.

<sup>9</sup> U.S. Census Bureau

Figure 7: Total Existing Home Sales Increased as Unemployment has Fallen<sup>10</sup>



Economic expansion has benefitted all demographic groups in the housing market, despite their unique economics issues. This was especially the case for millennials. Employment opportunities opened up, at the start of the period, 2012–2013, rental housing was still relatively reasonably priced, and due to the accommodative monetary policies of the Federal Reserve, mortgage rates remained at near historic lows.

Since that time the economy has accelerated and taken the housing market with it. While mortgage rates are above their historic lows, more millennials have been buying houses, at an increasing rate. However, it should be noted that while improvement is occurring, it is still fairly slow as judged by historical standards. There have been many theories posited for why millennials have been slow to jump into the purchased housing market, but nonetheless, it is occurring, and the reasons are reflective of historical norms.

### MILLENNIALS ARE SLOWLY FORMING HOUSEHOLDS AND EXPANDING THEIR CHOICES OF WHERE TO LIVE

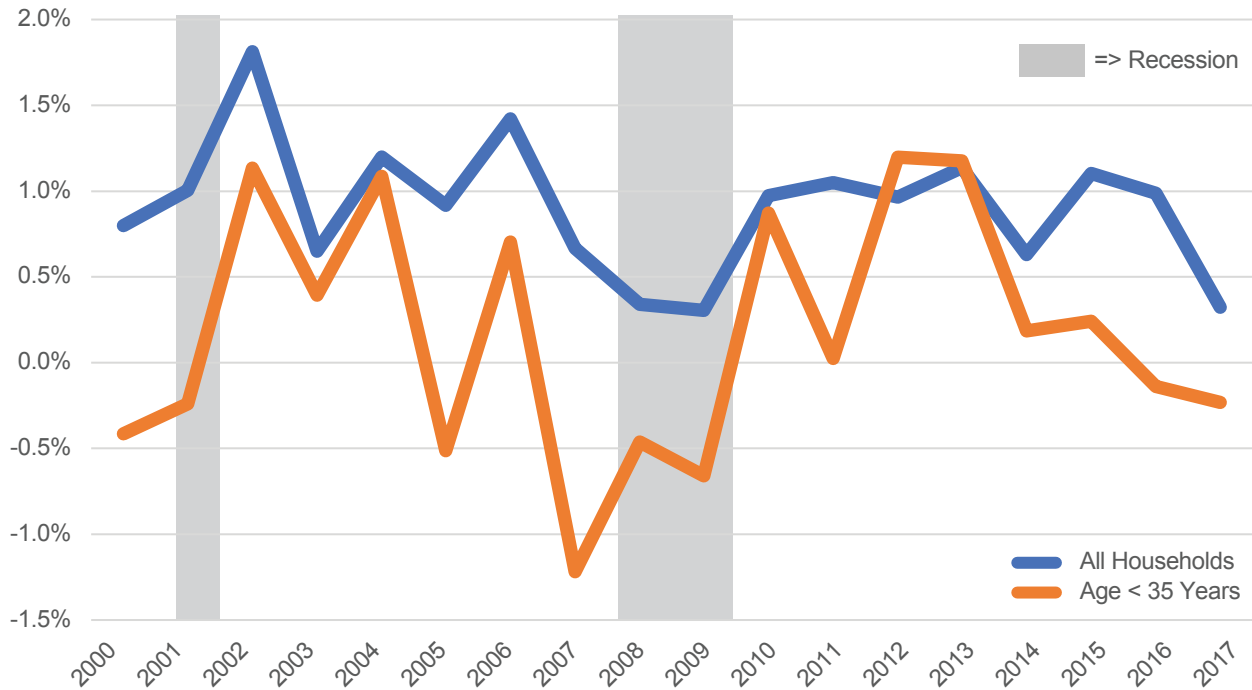
According to the U.S. Census Bureau, the total number of U.S. households rose to 126.2 million, the largest in U.S. history. While this represented a 0.3 percent increase from 2016, households headed by persons aged 34 and less declined by 0.2 percent. However, this decline represented a marginal decrease from the multiple years between 2010 and 2016 when the millennial generation increased their headship rates at an average level of 0.5 percent (Figure 8). Much of this increase is accounted for by young adults

engaging in the normal process of leaving home and starting out on their own, albeit on a delayed schedule due to the lingering effects of the Great Recession of 2007–2009 on the employment market. While admittedly, many of those millennials opted to seek out rental housing, as normally the first housing decision is, an increasing number has been opting for purchased housing. Much of this phenomenon is driven to the fact that urban rents remain high and vacancy rates at near record lows.

<sup>10</sup> National Association of Realtors®; Bureau of Labor Statistics



Figure 8: Growth Rate in Number of Households by Age of Householder<sup>11</sup>



While it remains the case that millennials are seeking to locate in urban areas at a greater rate than prior generations, it is also the case that many are giving the suburbs, where they grew up, a second look. NAR’s 2018 Generational Trends report also found an increased share of millennials purchased in suburban locations and purchased detached

single-family homes. Much of this development can be accounted for due to greater household formation and family growth. Forty-eight percent of buyers 37 years and younger now have children under the age of 18 in their home, 66 percent are married couples, and 15 percent are unmarried couples (the largest share of all generations).

### DESPITE IMPROVEMENTS, CHALLENGES REMAIN

In conclusion, things are looking up for America’s largest generation—the millennials. Their homeownership rates posted its first annual increase in 2017 for the first time in 13 years. Employment growth is strong and income levels, albeit slowly, are rising. Plus, they are moving out, both figuratively and literally, and starting families. But despite all these promising signs, challenges remain to see rapidly expanding rates of homeownership. As we enter a period of

what looks to be sustained increases in interest rates, slow growth in new housing supply, and new restrictions on federal tax deductions, affordability will remain a challenge for these young prospective homeowners. While it is reasonable to assume that they, like the many generations before them, will seek out the American Dream of homeownership, it remains likely that this pursuit will be an extended one when judged by historical norms.

<sup>11</sup> U.S. Census Bureau

# PAST, CURRENT, AND FUTURE HOUSING CHALLENGES IN THE UNITED STATES

**Katrin B. Anacker, PhD**

*Associate Professor, George Mason University*

*North American Editor, International Journal of Housing Policy*

*Review Editor, Journal of Planning Education and Research*

*kanacker@gmu.edu*

## ABSTRACT

*This paper summarizes the key themes of Introduction to Housing, second edition, edited by Katrin B. Anacker, Andrew T. Carswell, Sarah D. Kirby, and Kenneth R. Tremblay<sup>1</sup>. The book discusses different ways of understanding housing. Based on select portions of this book, this article looks at past, current, and future housing challenges in the United States. The first section discusses the Great Recession and the public policy response. The second section focuses on current and future trends in demographics, including baby boomers and millennials. The third section discusses current and future trends in socioeconomics, paying attention to housing affordability. The fourth section focuses on current and future trends in design and construction. The article closes with a conclusion and reflections on future research.*

**Keywords:** *housing, demographics, affordability, design and construction*

Housing can be understood in many ways. For an individual, it may be a place to lay down roots, the center of household life, or a place characterized by household challenges (Edin and Shaefer 2015). For a homeowner, it may be a solid foundation for building long-term wealth, but it may also result in foreclosure and difficulties reestablishing one's credit history (Barofsky 2012, Bernanke 2015, Blinder 2014, Dayen 2016, Engel and McCoy 2011, Martin and Niedt 2015, Mian and Sufi 2014, Paulson 2010). For a neighborhood, it may be the location of a well-maintained housing stock, enabling thriving community life, or it may be the location of vacancies, vandalism, and squatting (Hollander 2011, Jacobs 1992, Mallach 2009, 2010, Satter 2009). For a city, it may be a source of high revenue streams through property taxes, or there may be cases of overwhelming liability, resulting in the need to condemn entire buildings, board up windows, mow front lawns, or remove snow (Brash 2011, Hartman and Squires, 2013). For a society, it may result in people being well-housed in a safe,

affordable, and attractive housing stock, or people struggling to find affordable, high-quality housing (Abramsky 2013, Desmond 2016, Woldoff et al. 2016). For housing scholars, housing can be understood as a commodity, or as a right (Bratt et al. Hartman 2006; Pattillo 2013).

The authors of Introduction to Housing, second edition, edited by Katrin B. Anacker, Andrew T. Carswell, Sarah D. Kirby, and Kenneth R. Tremblay discuss these different ways of understanding housing. Based on select portions of this book, this article looks at past, current, and future housing challenges in the United States. The first section discusses the Great Recession and the public policy response. The second section focuses on current and future trends in demographics, including baby boomers and millennials. The third section discusses current and future trends in socioeconomics, paying attention to housing affordability. The fourth section focuses on current and future trends in design and construction. The article closes with a conclusion and reflections on future research.

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<sup>1</sup> Published by the University of Georgia Press

## THE GREAT RECESSION AND THE PUBLIC POLICY RESPONSE

Over approximately the past two decades, the housing landscape in the United States has changed rapidly. The U.S. experienced a national house price bubble that started in 2000 and ended in mid-2006, triggering the national subprime and foreclosure crises, which started in the first quarter of 2007, peaked in 2010, and then gradually declined in the following years (Barofsky 2012, Blinder 2014, Dayen 2016, Geithner 2014, Gottesdiener 2013, Mallaby 2010, Paulson 2013, Rascoff and Humphries 2015, RealtyTrac n.d., Taub 2014). In turn, these crises triggered the Great Recession, which started in December 2007 and technically ended in June 2009, resulting in three types of government intervention.

First, the government intervened for the financial sector through the Emergency Economic Stabilization Act (EESA), which was passed in October 2008 and for which \$700 billion was allocated. The EESA included the Troubled Assets Relief Program (TARP), for which \$445 billion was initially allocated, \$377 billion repaid, and \$61 billion written off (Lerner et al. 2017). Originally, the government designed TARP to purchase toxic assets, but it ended up being a program that disbursed funds to banks and the auto industry in exchange for dividend-paying preferred stock (Prins 2009, Zandi 2012). Due to TARP, the financial system survived the crisis.

Second, the government intervened for the economy through the American Recovery and Reinvestment Act (ARRA), one of the largest economic recovery programs in U.S. history, which was signed into law in February 2009 and for which \$787 billion was allocated between fiscal years 2009 and 2019 (Reichling et al. 2015, Zandi 2012). The Congressional Budget Office most recently estimated ARRA's impact to be \$836 billion between fiscal years 2009 and 2019 (Reichling et al. 2015). ARRA stimulated the purchase of goods and services by funding construction and other investment activities that may take several years to complete; it provided funds to states and municipalities and increased aid for education and transportation projects; it supported people in need by extending and expanding unemployment and Supplemental Nutrition Assistance Program (SNAP) benefits; and it provided temporary tax relief for individuals and businesses by raising exemption amounts for the alternative minimum tax, adding a new Making Work Pay tax credit, and creating enhanced deductions for depreciation of business equipment (Reichling et al. 2015, Zandi 2012).

Third, the government intervened for consumers through the Economic Stimulus Act of 2008, which the George W. Bush administration signed into law in February 2008. This \$152 billion stimulus provided tax rebates for low- and middle-income U.S. taxpayers and tax incentives to generate business investment. It also increased limits on conforming mortgages eligible for government insurance and GSE purchase to stimulate the economy (Zandi 2012). In August 2007, the Federal Housing Administration (FHA) established the FHA Secure program, which refinanced mortgages of delinquent borrowers into more affordable loans, resulting in 266 endorsed loans until December 2007 (Immergluck 2013, Jackson 2008). In December 2007, the National Foreclosure Mitigation Counseling (NFMC) program was established, through which local housing counseling organizations provided advice to more than one million borrowers in or at-risk-of foreclosure (Immergluck 2013).

In July 2008, the Housing and Economic Recovery Act (HERA) introduced the Hope for Homeowners (H4H) Program, through which lenders could write down existing mortgages and refinance borrowers' loans for less than 90 percent of their current property value, resulting in only 340 loans originated through the program (Immergluck 2013). HERA also provided a tax credit for eligible first-time home buyers (later expanded to include those who had not owned a home in the past three years) of up to \$8,000 from 2008 to 2010 (Immergluck 2013, Internal Revenue Service n.d., Pozen 2010). HERA also established the first wave of the Neighborhood Stabilization Program (NSP 1), which allocated \$3.9 billion of formula-based funding across both existing Community Development Block Grant (CDBG) entitlement communities and states (Immergluck 2013). ARRA authorized the second wave of the NSP (NSP 2), resulting in \$2 billion of competitive funding for communities. Finally, the Dodd-Frank Wall Street Reform and Consumer Protection Act established the third wave of the NSP (NSP 3), which allocated \$1 billion to state and local governments on a formula basis (U.S. Department of Housing and Urban Development n.d.).

During the Obama administration, the following foreclosure prevention programs were established: the Home Affordable Modification Program (HAMP), the FHA-HAMP, and the Home Affordable Refinance Program (HARP) in April 2009; the Second Mortgage Program (2MP) in March 2010; the Home Affordable Foreclosure Alternatives (HAFA) in April 2010; the Home Affordable Unemployment Program (UP) in July 2010; the Hardest

Hit Fun (HHF) in September 2010; the FHA Short Refinance (FHA Short Refi) in September 2010; the Principal Reduction Alternative (PRA) in October 2010; and the Emergency Homeowners Loan Program in June 2011 (Immergluck 2013). Despite these many efforts, the federal response to the foreclosure crisis may have been “too little, too late, and too timid” (Immergluck 2013: 199).

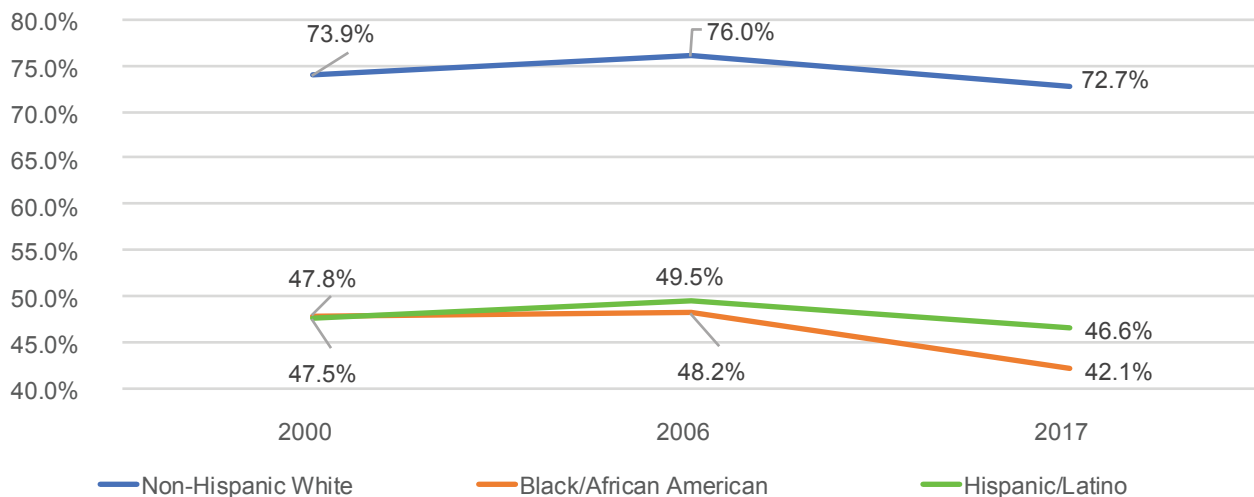
Estimates of lost household wealth during the Great Recession range from \$7 trillion (Raskin 2012), to over \$12.8 trillion (Kelleher et al. 2012, Wessel 2016), to \$19.2 trillion (The Department of the Treasury 2012). The amount of wealth lost at the neighborhood level was \$509 billion, including wealth lost by homeowners who lived near foreclosed properties, along with undermaintenance, vacancies, squatting, vandalization, arson, and crime (Center for Responsible Lending n.d., based on CRL, Credit Suisse, Moody’s Economics.com, MBA, Kingsley et al. 2009). The amount of wealth lost at the household level

was estimated to be \$90,000 per household (Bowdler et al. 2010, Kingsley et al. 2009, Mian and Sufi 2014).

While the economy has largely recovered, many communities and households, and especially communities and households of color, are still recovering from the Great Recession. The homeownership rate among Whites was 73.9 percent in 2000, 76 percent in 2006 and 72.7 percent in 2017, for a decrease of 3.3 percentage points from 2006 to 2017 (Q4 data, U.S. Bureau of the Census n.d.). By contrast, the homeownership rate among Blacks was 47.8 percent in 2000, 48.2 percent in 2006 yet only 42.1 percent in 2017, a decrease of 6.1 percentage points from 2006 to 2017, and among Hispanics it was 47.5 percent in 2000, 49.5 percent in 2006 compared to 46.6 percent in 2017, a decrease of 2.9 percentage points (U.S. Bureau of the Census n.d.), as shown in Figure 1.

It will take many communities and households decades to reverse this decrease and generations more to reach the White homeownership rate (Anacker 2018).

Figure 1: U.S. Homeownership Rate by Householder Race and Ethnicity: 2000, 2006, and 2017 (all Q4)<sup>2</sup>



## CURRENT AND FUTURE TRENDS IN DEMOGRAPHICS: BABY BOOMERS AND MILLENNIALS

Over the past few decades, the demographic environment of the United States has changed. While baby boomers (i.e., those born between 1946 and 1964) have been much studied over the past several decades, millennials (i.e., those

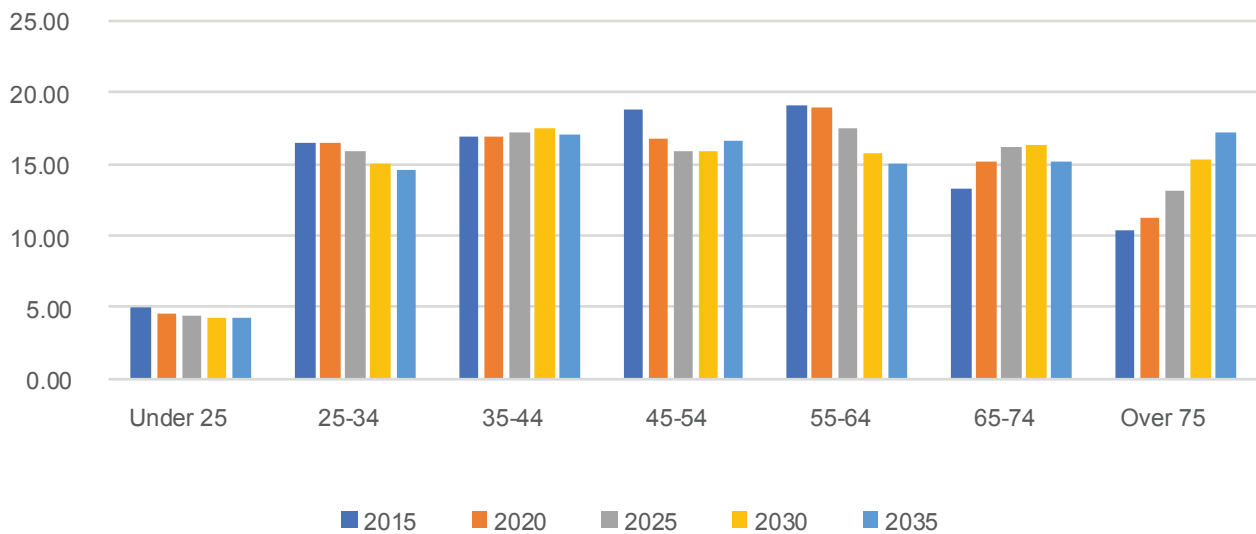
born between 1985 and 2000) have only recently been discussed, although they have surpassed baby boomers in terms of numbers and become large drivers of the future housing market (Anacker et al. 2018).

2 U.S. Bureau of the Census, n.d.

Over the next two decades, further shifts in age composition are expected as the baby boomers enter their retirement years and increase the proportion of households headed by someone at least sixty-five years old, from 24 percent in 2015 to 32 percent in 2035 (Drew 2018, McCue 2014). Millennials are expected to continue the trend of deferring household formation in favor of more time spent living at home, pursuing education, or living with roommates (Drew

2018). The young adult share of all households, therefore, is expected to remain at around 20 percent through 2035 (Drew 2018, McCue 2014, see Figure 2). The next generation to enter young adulthood, meanwhile, is Generation Z (i.e., those born after 2000), also called Post-Millennials, the Homeland Generation, or the iGeneration (Bromwich 2018).

*Figure 2: Projected Proportion Distribution of U.S. Households by Age Group, 2015 - 2035<sup>3</sup>*

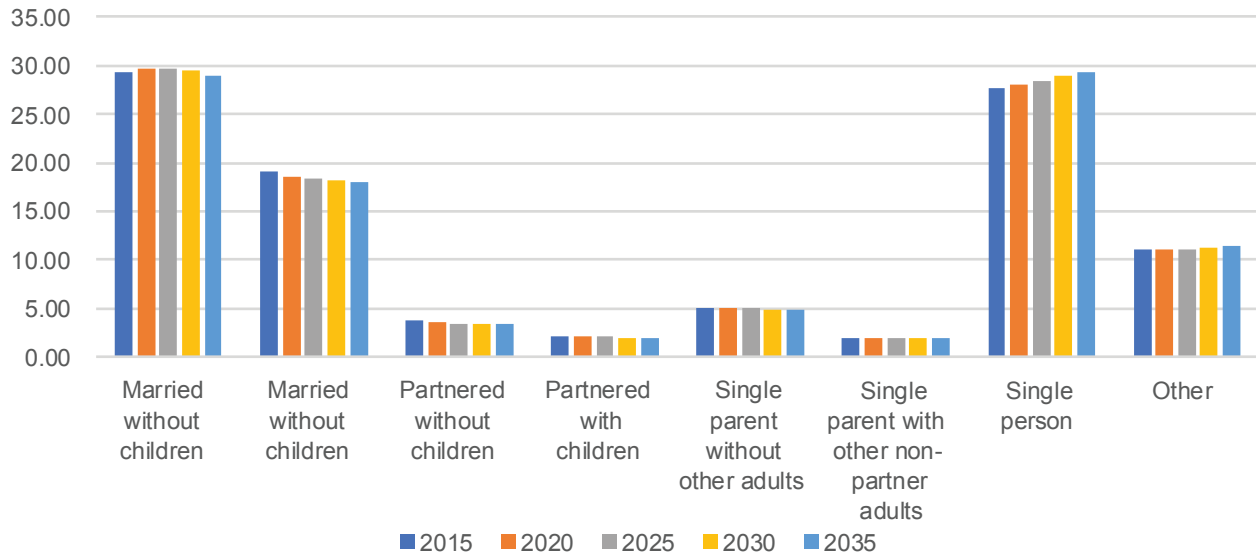


In addition, further shifts in family type are expected due to the decline in the proportion of households with married couples with children and the increase in the proportion of households with single persons, single parents, unmarried couples with children, and unrelated roommates (Drew 2018, see Figure 3). These shifts in the distribution of households have important implications for housing

demand (Drew 2018). Higher proportions of senior or childless households will require smaller and more affordable housing units, possibly in denser urban locations, that offer accessibility and amenities suitable for an aging population (Been et al. 2014, Drew 2018, Joint Center for Housing Studies of Harvard University 2014).

<sup>3</sup> Calculations of proportions by author, based on middle scenario projection numbers by McCue (2014).

Figure 3: Projected Proportion Distribution of U.S. Households by Marital Status, 2015 – 2035<sup>4</sup>



Adjusting the housing stock has been and will continue to be a challenge that will require incorporating aspects of

housing affordability, discussed below, and innovative solutions in design and construction, discussed further below.

### CURRENT AND FUTURE TRENDS IN SOCIOECONOMICS: HOUSING AFFORDABILITY

Over the past several decades, the quality and accessibility of homes have increased for most residents, while their affordability has decreased for some residents (Anacker and

Li 2016). More specifically, the number of affordable units has decreased while the gap between housing costs and incomes has increased (Watson et al. 2017, see Table 1).

<sup>4</sup> Calculations of proportions by author, based on middle scenario projection numbers by McCue (2014)

Table 1: Household Challenges, 2001-2015<sup>5</sup>

Proportion of Households (in Percent)	2001	2003	2005	2007	2009	2011	2013	2015
Unassisted with severe problems	12.8	12.7	14.8	15.3	17.2	18.0	16.0	15.2
Unassisted with non-severe problems only	18.2	18.7	19.1	20.5	20.8	20.9	19.1	18.3
Unassisted with no problems	63.0	62.8	60.0	59.5	57.7	56.5	60.2	61.8
Assisted	6.0	5.9	6.0	4.7	4.4	4.6	4.8	4.7
<b>Total Households</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Cost burden >50% of income	12.6	12.5	15.1	15.5	17.4	18.1	16.2	15.9
Cost burden >30-50% of income	16.1	16.9	17.8	19.1	19.5	19.4	18.0	16.3
Severely inadequate housing	2.0	1.9	1.9	1.6	1.7	1.8	1.7	1.3
Moderately inadequate housing	4.3	4.1	3.8	3.6	3.5	2.7	3.4	3.3
Crowded housing	2.5	2.4	2.4	2.3	2.2	1.7	2.2	1.5

The implications of millions of households facing such housing cost burdens are significant. Many households have difficulty affording other basic needs, such as food, transportation to work, health care, and clothing (Drew 2018, Joint Center for Housing Studies of Harvard University 2015). Shaun Donovan, former Secretary of the U.S. Department of Housing and Urban Development, has called this trend a “silent crisis” (Donovan 2013). This crisis will most likely worsen in the near and distant future.

The past and present shortage of affordable housing is a result of the challenge of both preserving existing affordable units and building enough new affordable housing units (Cook et al. 2018). Rehabilitating older buildings can cost more than either their value or constructing new units because they may have structural or maintenance issues that must be brought up to current code requirements (Cook et al. 2018, Feldman 2002). Thus, many older units are ultimately lost to decay or demolition (Cook et al. 2018, National Association of Home Builders 2014). Other challenges are zoning, land use restrictions, impact fees, the loss of affordable units to gentrification, high-income households that rent low-cost units, and some small landlords who have little revenue to cover operating and maintenance

costs and prioritize their own incomes over maintaining quality housing (Cook et al. 2018, National Association of Home Builders 2014). In summary, the demand for low-cost housing has surpassed the supply of low-cost housing in most communities and will continue to do so in the future.

In the past there have been solutions on both the demand and supply sides to address the affordable housing crisis. On the demand side, solutions for renters have included Housing Choice Vouchers and solutions for homeowners have included the Mortgage Interest Deduction (MID), the Federal Housing Administration (FHA), and the Federal Housing National Mortgage Association (Fannie Mae). However, resources for renters have fallen far short of the growing need for assistance (Drew 2018). For example, in 2013, the U.S. Department of Housing and Urban Development (HUD) estimated that only about 25 percent of low-income renters eligible for federal housing assistance received a subsidy to offset their housing costs (Drew 2018, Watson et al. 2017). This proportion will most likely decrease in the near and distant future.

<sup>5</sup> Watson et al. (2017), presentation of the data is slightly modified by the author

On the supply side, solutions can be clustered into three groups. First, policy makers have focused on “brick and mortar” policies, such as public and HOPE VI housing for renters and the Section 8 New Construction and Substantial Rehabilitation program for builders (Schwartz 2015). Second, policy makers, developers, investors, and planners have focused on housing finance policies, including the Low Income Housing Tax Credit (LIHTC), Community Development Block Grants (CDBG), the HOME Investment Partnership program, below-market

interest rate (BMIR) loans, community land trusts, housing trust funds, inclusionary zoning for state and local governments, and Community Development Corporations (CDCs) (Cook et al. 2018, Schwartz 2015). Third, developers, investors, and planners have focused on manufactured and modular housing (Cook et al. 2018), Universal Design (UD), or Accessory Dwelling Units (ADUs), which will become more common in the near future. The latter two solutions are discussed below.

### CURRENT AND FUTURE TRENDS IN HOUSING DESIGN AND CONSTRUCTION

Two solutions to address the affordable housing crisis are Universal Design (UD) and Accessory Dwelling Units (ADUs). In the 1970s, the American architect Michael Bednar introduced the idea of removing barriers in the built environment to enhance the functional capacity of both disabled and nondisabled people (Bednar 1977, Hartje et al. 2018). He suggested that a broader, more universal concept beyond accessibility was needed (Bednar 1977, Hartje et al. 2018). In the 1980s, the American architect Ron Mace, who used a wheelchair and a ventilator because of post-polio syndrome, began to use the term “universal design,” which he related to Bednar’s accessible design (Hartje et al. 2018). Over the past several years, UD has become more well-known.

Universal design, also called inclusive design, lifespan design, or design-for-all, is a design approach that recognizes the wide range of human physical, cognitive, and sensory abilities. According to the Center for Universal Design, “living spaces have long been designed for use by one ‘average’ physical type – young, fit, male and adult” (Center for Universal Design 2000: 4, Hartje et al. 2018). Functioning at peak ability, however, is often a temporary state of being, given that the aging process slows sensory and motor systems (Hartje et al. 2018, Null 2014). Also, “average” does not accurately represent the majority of people, including children, women, older adults, or people with permanent or temporal physical disabilities (Hartje et al. 2018). Many people survive permanently disabling accidents and illnesses, living longer lives (Hartje et al. 2018).

Universal Design benefits people through all life stages, including children, seniors, and those inconvenienced by a temporary or permanent injury or a progressive medical condition. It accommodates the changes most people experience over their lifespan and benefits those who would like to age in place (Hartje et al. 2018). People pushing baby strollers will appreciate nonstop entrances; children

or seniors can help prepare meals in kitchens with varying-height countertops; and movers, paramedics, and firefighters will appreciate wider doors and hallways on moving day or in emergencies (Hartje et al. 2018).

Universally designed housing is financially cost-effective in both the short and long term (Hartje et al. 2018). There are higher initial costs for design and construction in the short term but saved costs of future remodeling or moving in the long term (Hartje et al. 2018). Designing and building a home with UD features and products may cost slightly more than building a conventional home (Hartje et al. 2018). Many variables influence the cost of new housing construction, including site costs, hard costs for building and interiors (i.e., materials, construction, and labor), and soft costs (i.e., design fees, taxes, and insurance) (American Institute of Architects n.d., Hartje et al. 2018). However, the cost difference for interior design components such as lever door handles instead of knobs, 3-foot-wide doors, wider hallways, and differing placements of electrical outlets and switches may be minimal (Hartje et al. 2018), adding 0-5 percent to the costs of an otherwise equivalent typical home built without UD features (Sandra Hartje, personal communication with Richard Duncan, 2015, Hartje et al. 2018). Costs can range considerably higher if many additional features or higher-cost products and fixtures are used. Incorporating a shaft for an eventual elevator in a multi-story home can be expensive at the time of construction but may save money if an elevator is needed later (Hartje et al. 2018). The single largest costs may involve addressing design and engineering challenges for the entrance, as access can involve the close consideration of site selection, orientation, grading, and foundation styles (Hartje et al. 2018). However, altering an existing home to accommodate changing abilities or lifestyles can cost up to three times more than including the same features during the initial design and build stage, as the footprint of a home may need to be altered (Hartje et al. 2018, see Table 2).



*Table 2: Universal Design Features, Cost to Household, Post versus Ante Construction<sup>6</sup>*

Universal Design Feature	Cost to Household Post Construction	Cost to Household Ante Construction
Widen the hallway to accommodate a wheelchair	AUS\$4,500 (if increasing the hallway at the expense of the bedrooms and living rooms); or AUS\$10,000 (if maintaining the same living area and moving the external walls)	AUS\$1,200 to allow for the extra floor area, or no cost if the design was carefully considered
Widen the internal and external doors	AUS\$4,500	\$300
Ramp to the front door	AUS\$700	\$0 (the house would be designed with level thresholds)

In summary, basic UD features are achievable in homes of any size, although affordable housing developers and market-rate builders state that the smaller the size of the home, the greater the challenges associated with achieving a universal outcome (Sandra Hartje, personal communication with Richard Duncan, 2015, Hartje et al. 2018). In the future, the cost of UD planning and products will decrease as this design approach becomes more established and standardized, as professionals in the construction industry become more knowledgeable and experienced, and as products are increasingly available (Hartje et al. 2018, Null 2014).

The second solution to address the affordable housing crisis is ADUs, which are also called secondary, second, accessory, or ancillary units; secondary suites; and accessory apartments, backyard cottages, back houses, or alley or granny flats, among other terms (Brown et al. forthcoming, Canada Mortgage and Housing Corporation 2015, Chapple et al. 2017, Dunham-Jones and Williamson 2011, Mukhija 2014, Mukhija et al. 2014, Pfeiffer 2015, Regional Real Estate Consultants 1990, Williamson 2013). These units are located on single-family home properties and may take many forms, such as adapted garages, attics,

basements, rooms, or even attached apartments or detached cottages (Litchfield 2011, Pfeiffer 2018). ADUs may increase housing choices for owners and renters, contribute to the densification of neighborhoods, and make more effective and safer use of the existing housing stock, thus increasing the supply of affordable housing (Chapple et al. 2017, Dunham-Jones and Williamson 2011, Regional Real Estate Consultants 1990).

ADUs are usually financed and constructed by homeowners. At present, no federal public subsidies exist, so costs can be a barrier to their construction (Pfeiffer 2018). Qualifying for a loan to cover ADU costs is difficult in the current tight lending market in general and in the absence of special public programs in particular (Pfeiffer 2018). Although some localities provide technical assistance to homeowners and reduce their construction costs by waiving fees or allocating Community Development Block Grant (CDBG) funds if units will be rented at affordable rates to low-income families, public support is not widespread (Pfeiffer 2018, Sage Computing 2008). Thus, most homeowners will have to pay for construction out of pocket until programs are established (Pfeiffer 2018).

## CONCLUSION AND OUTLOOK

Over the past few decades, U.S. housing policy has been fragmented, which has resulted in the necessity to accomplish more with fewer resources. This development has been especially challenging given the lingering impacts of the housing crisis and the Great Recession.

In the meantime, the national homeownership rate has declined, returning to the level of the mid-1990s due to foreclosures, decreased household formation rates, and increased debt burdens. Two solutions on the supply side

are Universal Design and Accessory Dwelling Units, neither of which are currently supported by public policies. To increase wealth building and economic mobility in the short, middle, and distant future, local, regional, state, and national policy makers may want to focus on these and other innovative strategies.

<sup>6</sup> Queensland Government, Department of Housing, 2015

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# UNDER THE RADAR: REAL ESTATE INVESTMENT BEYOND THE USUAL SUSPECTS

**Hugh F. Kelly, PhD, CRE**

*Special Advisor, Fordham Real Estate Institute, Fordham University<sup>1</sup>  
hughkelly@hotmail.com*

## ABSTRACT

*Development of an urban taxonomy useful for commercial real estate investment has progressed from the level of descriptive to functional definition, providing a statistical basis for evaluating long-term investment performance. Previous research has examined the office and multifamily sectors, calculating total returns and capital flows in major markets, linking such measures to urban vibrancy. This research expands the investigation by looking specifically at smaller markets. The data reveal a subset of “secondary and tertiary” markets attracting higher-than-expected investment flows. The paper explores two characteristics that have been proposed as stimulants to economic performance—low housing costs and low state and local taxes—and tests the hypothesis that investors favor such places. That hypothesis remains unproven after this examination. The paper sharpens questions about how urban vibrancy attracts investment capital, how the housing market interacts with the commercial real estate market, and whether commercial property investment performance in sectors such as industrial property and retail property follow the patterns displayed in the office and multifamily sectors. These remain questions for future research.*

**Keywords:** *commercial and residential real estate, capital flows, urban vibrancy, economic incentives in taxation, large and small metro real estate markets.*

In the first years of recovery from the Global Financial Crisis, real estate investment capital flowed disproportionately to a handful of major markets in the United States. Large, coastal markets – Manhattan, preeminently – saw prices soaring and the competition for income-producing property driving capitalization rates down to historic lows. Around 2015, Real Capital Analytics (RCA), the data firm having the widest reach in compiling and interpreting transaction activity, began to note that investors were expanding their activity beyond the “major markets,” in search of properties still available for acquisition, at more attractive yields than were available in the top tier metropolitan areas. At about the same time, the Urban Land Institute/Pricewaterhouse Coopers’ publication, *Emerging Trends in Real Estate*, also noted in its annual survey increasing investor interest in smaller markets across the country.

Empirically, it was becoming evident that a new phase in the real estate industry recovery was underway.

Meanwhile, the academic literature was exploring anew the subject of urban taxonomy and the relationship of the built environment to key elements of urban vitality. The catchphrase “24-hour Cities” that had been coined in the mid-1990s by *Emerging Trends in Real Estate* was at last being investigated with analytical rigor, taking the term from a merely descriptive definition toward a verifiable set of measurable characteristics that was (a) statistically supported as a group of elements that justified the identification of some cities as a distinct cluster when compared with other places, and (b) tested the hypothesis that such distinct urban clusters had recognizably different real estate investment performance.<sup>2</sup> The urban planning literature began to see “vibrancy” as a key topic of discussion, in complementary research to the real estate investment studies.<sup>3</sup>

1 Hugh Kelly is a member of the Board of Regents of Realtor® University, and Special Advisor to Fordham University’s Real Estate Institute. He was 2014 Chair of the Counselors of Real Estate.

2 Kelly, H., A. Adair, S. McGreal, and S. Roulac. Twenty-four Hour Cities and Commercial Office Building Performance. *Journal of Real Estate Portfolio Management*, 2013, 19:2, 103–20.

3 Malizia, E. Vibrant Centers: Character, Types, Performance and Importance in Larger U.S. Metro Markets. *Real Estate Review*, 2015, 44:3, 49–58.

Fruitfully, those two strands of investigation have been coming together in recent years.<sup>4</sup>

Urbanists have been weighing in with books and articles that have expanded interest beyond real estate practitioners and academics into a wider public debate. Some see two opposing camps pressing for victory in a claim to establish the “best” kind of city. The school of thought kick-started by Richard Florida’s *The Rise of the Creative Class* highlights cities with the attributes of talent, tolerance, and technology.<sup>5</sup> Some have labeled such places “superstar cities.”<sup>6</sup> However, this postulate has been challenged as elitist by others, and there is a cadre of researchers maintaining that the future belongs to “new opportunity boomtowns” characterized by low costs (including housing and taxes) and business-friendly local governments.<sup>7</sup> Unlike many current debates, thankfully, the discussion is not entirely polarized. Harvard’s Edward Glaeser, UCLA’s Michael

Storper, UC Berkeley’s Emmanuel Saez, and Stanford’s Raj Chetty continue to enrich the discussion with thoughtful, evidence-based books, articles, and formal papers encouraging open-mindedness and an appreciation of the diversity of urban preferences.<sup>8</sup>

This paper seeks to contribute to such a discussion. It looks to put the recent shift in investor preferences into perspective by introducing a finer discrimination by urban economic structure and using that to unpack capital flows into cities of various sizes and configurations. It seeks to incorporate patterns of residential real estate market behavior, to supplement the data on commercial real estate investment flows. And it looks at some of the incentive claims relating to housing costs and local taxation to see if they are indeed the attributes driving population and employment change, and thereby investor choice in the real estate field.

## INCOME-PROPERTY INVESTMENT FLOWS, 2015 – 2017

Aggregate investment flows into commercial real estate reached an apparent cyclical peak in 2015, according to Real Capital Analytics data. In that year a total of \$533.6 billion was invested in U.S. properties, the second highest total registered, surpassed only by the \$570.0 billion in 2007, just prior to the Global Financial Crisis (Figure 1).

Since 2015, volume has declined 13.1% to \$463.9 billion in 2017. This is still the fourth highest investment amount since RCA began its database in 2001. In all, some \$1.486 trillion of commercial real estate was bought and sold in the three-year period 2015 – 2017.

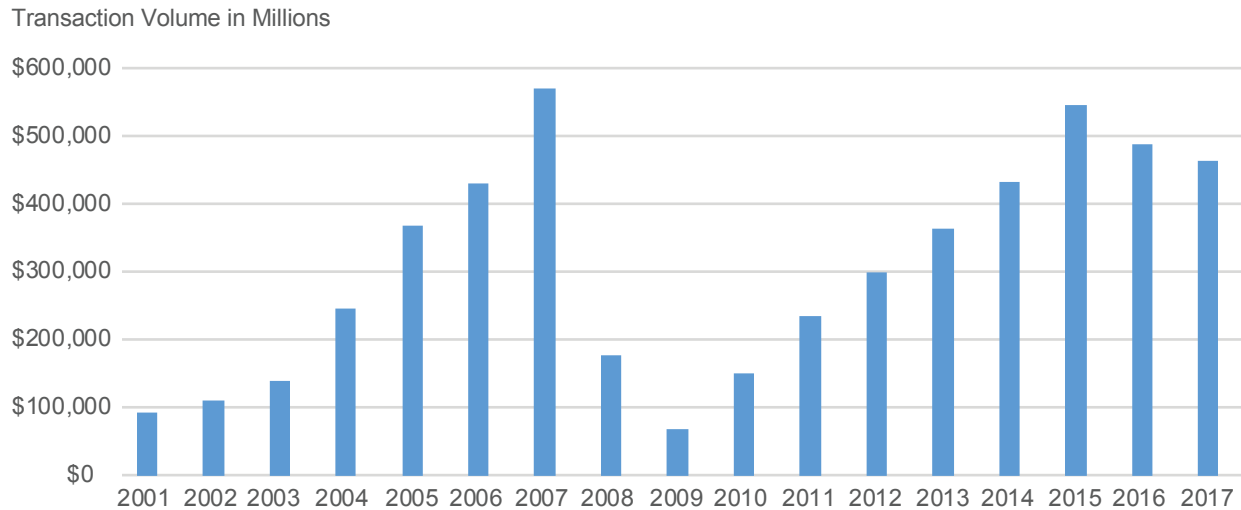
4 Kelly, H, and E. Malizia. Defining 24-Hour and 18-Hour Cities, Assessing Their Vibrancy, and Evaluating Their Property Performance. *Journal of Real Estate Portfolio Management*, 2017. 23:1 87-103.

5 Florida, R. *The Rise of the Creative Class*. Basic Books (New York, 2002).

6 Gyourko, J., C. Mayer, and T. Sinai. Superstar Cities: Why Do House Prices Rise Faster in Some Cities? NBER Working Paper 12355. National Bureau of Economic Research, 2006.

7 Kotkin, J. The New Opportunity Boomtowns. <https://chiefexecutive.net/new-opportunity-boomtowns/> Published February 2, 2018, and accessed April 3, 2018.

8 See Glaeser, EL. *The Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier and Happier*. Penguin Press (New York, 2011). Storper, M. *Keys to the City: How Economics, Institutions, Social Interaction, and Politics Shape Development*. University Press (Princeton, 2013). Chetty, R., et al, Where Is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States. National Bureau of Economic Research. June 2014.

Figure 1: Real Estate Transaction Volume Easing from Peak<sup>9</sup>


To disaggregate the data in a useful way, Table 1 presents year-by-year investment totals for 38 metro areas, the sum of investment for each metro over the three-year period, the percentage of total U.S. investment volume represented by each metro, as well as its current Census-estimated population, and the resulting amount of per-capita commercial real estate investment.<sup>10</sup> Each metro is identified in a market “tier,” building upon previous research in urban

vibrancy and real estate performance.<sup>11</sup> Taken together, these 38 metros accounted for 78% of all property investment in 2015-2107, recorded in the RCA database (Table 2). The six markets in Tier 1 hold a 30.7% share for the period, although its annual share has declined since 2015. The seven markets in Tier 2 represent a 15.2% share, relatively steady over the period. And the 25 Tier 3 markets hold a 32.1% share, which has risen since 2015.

 Table 1: Recent Real Estate Investment in U.S. metro markets<sup>12</sup>

Metro Market	Tier	2015 (millions of dollars)	2016 (millions of dollars)	2017 (millions of dollars)	3-year total	% of U.S. Total Sales	Population	Per Capita Investment
New York	1	\$88,362	\$65,287	\$45,720	\$199,369	13.40%	14,398,700	\$13,846
Boston	1	\$17,594	\$14,839	\$14,478	\$46,912	3.20%	4,794,447	\$9,785
Washington	1	\$24,004	\$20,472	\$23,421	\$67,897	4.60%	6,131,977	\$11,073
Chicago	1	\$23,209	\$20,388	\$17,762	\$61,360	4.10%	9,512,999	\$6,450
San Francisco	1	\$22,758	\$23,442	\$16,255	\$62,455	4.20%	4,679,166	\$13,347
Philadelphia	1	\$5,755	\$5,589	\$6,465	\$17,809	1.20%	6,070,500	\$2,934
Seattle	2	\$15,175	\$15,848	\$12,764	\$43,787	2.90%	3,798,902	\$11,526

9 Real Capital Analytics

10 It is important to note that data is presented at the level of the CBSA metro area. CBSA stands for “core-based statistical area” as defined by the Office of Management and Budget of the Federal government. Thus “New York” signifies the New York-Jersey City-White Plains NY-NJ region, “Los Angeles” the Los Angeles-Long Beach-Glendale CA area, and similarly for all 38 metros in the sample. Thus, although city names are utilized, data refers to the entire urban configuration around the core.

11 Kelly and Malizia, art. cit.

12 Real Capital Analytics, “Big Picture” reports at respective years-end

Metro Market	Tier	2015 (millions of dollars)	2016 (millions of dollars)	2017 (millions of dollars)	3-year total	% of U.S. Total Sales	Population	Per Capita Investment
Los Angeles	2	\$28,333	\$29,366	\$28,573	\$86,272	5.80%	13,310,447	\$6,482
Miami	2	\$8,634	\$9,048	\$6,480	\$24,162	1.60%	6,066,387	\$3,983
Portland	2	\$6,179	\$6,153	\$4,922	\$17,255	1.20%	2,424,955	\$7,116
Minneapolis	2	\$5,045	\$5,347	\$5,007	\$15,399	1.00%	3,551,036	\$4,336
Austin	2	\$8,053	\$9,165	\$7,277	\$24,495	1.60%	2,056,405	\$11,912
Baltimore	2	\$5,837	\$3,478	\$5,193	\$14,508	1.00%	2,798,886	\$5,183
St. Louis	3	\$2,614	\$2,626	\$2,738	\$7,978	0.50%	2,807,002	\$2,842
Indianapolis	3	\$2,518	\$2,671	\$2,851	\$8,040	0.50%	2,004,230	\$4,012
San Diego	3	\$10,043	\$9,023	\$8,075	\$27,141	1.80%	3,317,749	\$8,181
Denver	3	\$10,976	\$12,192	\$11,136	\$34,305	2.30%	2,853,077	\$12,024
Salt Lake City	3	\$2,180	\$2,022	\$2,739	\$6,941	0.50%	1,186,187	\$5,851
Milwaukee	3	\$1,479	\$1,316	\$1,505	\$4,300	0.30%	1,572,482	\$2,735
Cleveland	3	\$1,210	\$891	\$1,320	\$3,421	0.20%	2,055,612	\$1,664
Cincinnati	3	\$1,911	\$1,603	\$1,730	\$5,244	0.40%	2,165,139	\$2,422
Houston	3	\$12,419	\$10,052	\$14,274	\$36,745	2.50%	6,772,470	\$5,426
San Jose	3	\$13,269	\$9,530	\$10,849	\$33,648	2.30%	1,978,816	\$17,004
Nashville	3	\$3,767	\$3,908	\$3,545	\$11,220	0.80%	1,865,298	\$6,015
Raleigh	3	\$5,053	\$4,223	\$4,246	\$13,522	0.90%	1,302,946	\$10,378
Atlanta	3	\$17,345	\$17,645	\$17,283	\$52,274	3.50%	5,789,700	\$9,029
Hartford	3	\$890	\$992	\$861	\$2,743	0.20%	1,206,836	\$2,273
Columbus	3	\$2,818	\$1,894	\$2,153	\$6,864	0.50%	2,041,520	\$3,362
San Antonio	3	\$3,694	\$3,287	\$3,984	\$10,965	0.70%	2,429,609	\$4,513
Tampa	3	\$5,685	\$5,930	\$5,497	\$17,112	1.20%	3,032,171	\$5,644
Charlotte	3	\$4,456	\$5,430	\$6,232	\$16,118	1.10%	2,474,314	\$6,514
Dallas	3	\$20,252	\$21,718	\$20,674	\$62,644	4.20%	7,233,323	\$8,661
Phoenix	3	\$12,600	\$11,761	\$11,406	\$35,767	2.40%	4,661,537	\$7,673
Kansas City	3	\$2,721	\$2,945	\$3,108	\$8,774	0.60%	2,104,509	\$4,169
Riverside	3	\$8,120	\$6,232	\$7,201	\$21,553	1.50%	4,527,837	\$4,760
Las Vegas	3	\$4,120	\$8,116	\$6,417	\$18,652	1.30%	2,155,664	\$8,653
Orlando	3	\$7,402	\$5,610	\$7,086	\$20,098	1.40%	2,441,257	\$8,233
Sacramento	3	\$3,455	\$3,573	\$4,193	\$11,220	0.80%	2,296,418	\$4,886



Table 2. Summary statistics of 2015 – 2017 Sales Data<sup>13</sup>

	2015 (millions of dollars)	2016 (millions of dollars)	2017 (millions of dollars)	3-year total	% of U.S. Total Sales
Sum of 38 Metros Sales	\$419,933	\$383,616	\$355,418	\$1,158,967	78.0%
Total U.S. Sales	\$533,640	\$488,586	\$463,915	\$1,486,142	100.0%
38 Metros	78.7%	78.5%	76.6%	78.0%	
% of U.S.					
Tier 1 % of U.S.	34.0%	30.7%	26.8%	30.7%	
Tier 2 % of U.S.	14.5%	16.0%	15.1%	15.2%	
Tier 3 % of U.S.	30.2%	31.8%	34.7%	32.1%	

Since U.S. metros vary significantly in population, the investment volume is converted to per-capita terms. On average, these 38 metros have received \$6,971 in real estate acquisition per capita. (It should be noted that this group of markets receives a disproportionately high share of real estate investment, attracting 78% of the capital flow despite having only 46.6% of total U.S. population.)<sup>14</sup> Table 3 identifies the top ten markets in per-capita property investment, as well as the bottom ten.

Some surprises immediately come to the fore in the per-capita investment rankings. While four of the six Tier

1 vibrancy markets (New York, San Francisco, Washington, and Boston) are in the top ten, so are four Tier 3 vibrancy markets (San Jose at number one, joined by Denver, Raleigh, and Atlanta). Austin and Seattle are the Tier 2 markets rounding out the top ten. The bottom of the list is, as expected, dominated by eight low vibrancy Tier 3 markets (Cleveland, Hartford, Cincinnati, Milwaukee, St. Louis, Columbus, Indianapolis and Kansas City). Miami is the sole Tier 2 vibrancy market with low per-capita investment. And Philadelphia attracts the 33rd ranked \$2,934 investment per-capita despite its Tier 1 vibrancy.

Table 3: Top Ten and Bottom Ten Metros in Per-Capita Property Investment (2015-2017)

Rank	Metro	Tier	Amount	Rank	Metro	Tier	Amount
1	San Jose	3	\$17,004	38	Cleveland	3	\$1,664
2	New York	1	\$13,846	37	Hartford	3	\$2,273
3	San Francisco	1	\$13,347	36	Cincinnati	3	\$2,422
4	Denver	3	\$12,024	35	Milwaukee	3	\$2,735
5	Austin	2	\$11,912	34	St. Louis	3	\$2,842
6	Seattle	2	\$11,526	33	Philadelphia	1	\$2,934
7	Washington DC	1	\$11,073	32	Columbus	3	\$3,362
8	Raleigh	3	\$10,378	31	Miami	2	\$3,983
9	Boston	1	\$9,785	30	Indianapolis	3	\$4,012
10	Atlanta	3	\$9,029	29	Kansas City	3	\$4,169

13 Real Capital Analytics, “Big Picture” reports at respective years-end

14 Census Data accessed from the census.gov website on March 21, 2018. The 2017 U.S. population figure utilized is 325,719,178.

## INDUSTRY STRUCTURE AND GROWTH CHARACTERISTICS

Economic base theory suggests that local economic structure can contribute powerfully to a metropolitan area's prosperity. A local economy generates wealth through its "base" or "export" industries, those sectors that create surplus production that can be sold to markets elsewhere.<sup>15</sup> The standard technique for identifying such export industries is the calculation of Location Quotients (LQ), which measure an industry's concentration in the local economy compared with its overall share in the national economy. Location Quotients have been calculated for the major industry sectors in all 38 metros, as of 2017. An industry was considered an "export" industry if it attained a LQ of 1.20 or greater. If a metro had three or more such industries, it has been considered "diversified", or if no industry attained that LQ the metro was also classified as "diversified" as its economic structure measured close to the national average across all industry groups. The Economic Location Matrix displayed in Table 4 places the 38 metros into those categories on its vertical axis.<sup>16</sup>

Since 1991, the U.S. economy has grown 38.8 million jobs, or about 35.6% over a 27-year period into early 2018. This works out to a 1.1% compound annual rate of change. On the horizontal axis of the Economic Location Matrix, metro areas with growth below the U.S. averages are classified as "low growth"; metros with annual growth rates above 1.1% up to 1.6% are considered "average growth" areas; metros with job expansion of more than 1.6% annually are labeled "high growth." For the nation, the standard deviation of annual employment change (in percentage terms) is 1.64. If a metro's standard deviation is between 1.35 and 1.99, the Economic Location Matrix classifies the metro as "average volatility"; if the metro's standard deviation is 2.00 or above, it is labeled "high volatility" on the horizontal axis. Thus, there are six columns representing growth and volatility on the matrix, representing the six possible combinations of these measures of employment change.<sup>17</sup>

15 Mills, ES and BW Hamilton. *Urban Economics*. (4th ed.). Scott Foresman and Co. (Boston, 1989)

16 Versions of the Economic Location Matrix have been presented since the late 1980s, typically in discussions of real estate investment portfolio diversification by authors including D. Hartzell, H. Kelly, and C. Wurtzebach. Such attempts to structure geographic diversification strategies have had limited success. The present matrix is simply an analytical tool to measure economic characteristics and investment flows ex post.

17 Employment data from the U.S. Bureau of Labor Statistics, [www.bls.gov/data](http://www.bls.gov/data)

Table 4: Economic Location Matrix

Structure (LQ)	Avg. Volatility/ Low Growth	Avg. Volatility/ Avg. Growth	Avg. Volatility/ High Growth	High Volatility/Low Growth	High Volatility/Avg. Growth	High Volatility/High Growth
Diversified	Boston New York St. Louis	Washington DC Indianapolis			San Diego	Denver Salt Lake City
Mfg. Capital Goods	Milwaukee Cleveland					
Mfg. Consumer Goods	Cincinnati					
Energy			Houston			
Trade/ Transportation					Miami	Riverside
Information/ Technology		Seattle		San Jose San Francisco Los Angeles	Portland	Nashville Raleigh Atlanta Austin
Finance	Hartford	Minneapolis Columbus	San Antonio		Tampa	Charlotte Dallas Phoenix
Professional/ Business Services	Chicago Kansas City					
Education/Health	Philadelphia Baltimore					
Leisure/ Hospitality						Las Vegas Orlando
Government					Sacramento	

In terms of economic base structure, it is notable that the shift in the U.S. economy toward information and technology places nine of the 38 metros in that category, including one Tier 1 vibrancy metro (San Francisco), and three Tier 2 vibrancy metros (Austin, Los Angeles, and Seattle). The “diversified” category has the next greatest number, with eight metros, including three Tier 1 vibrancy metros (Boston, New York, and Washington) but no Tier 2 markets. The finance category also includes eight metros, of which none are Tier 1 and only Minneapolis is a Tier 2 vibrancy market.

The metros migrate to the left and right columns of the matrix. There are 12 markets falling in the High Volatility/High Growth grouping, and eleven of these are Tier 3 vibrancy metros. Only Austin, a Tier 2 metro, is found in this cluster. But the second most numerous cluster is the Average Volatility/Low Growth column, with 11 metros. Four of these are Tier 1 vibrancy locations (Boston, Chicago, New York, and Philadelphia), and one (Baltimore) is rated Tier 2 in vibrancy. Fifteen markets are distributed

in the middle four columns, with Tier 1 and 2 vibrancy markets in all but the Average Volatility/High Growth classification (consisting of two Texas markets, Houston and San Antonio).

Returning to the metric of real estate investment flows per-capita, however, all the top ten metros are in either the Diversified structure (4 markets) or in the Information/Technology group (6 markets). The bottom ten markets in investment per-capita are broadly scattered by economic bases. However, six of the bottom ten metros are in the low growth columns, and four are in the average growth markets. And nine of the ten are in average volatility groupings. It appears that, corrected for population size, investors will accept low to moderate growth if they feel protected by diversity in the local economy and/or low levels of cyclical variation. But they will trade cyclical risk and lesser urban vibrancy if they can place capital in high growth areas, especially in technology-dominant metros.

Table 5 uses the matrix classification to display aggregate investment in the 2015-2017 period. Diversified metros captured the highest sum of total investment (\$398.6 billion), propelled by Tier 1 metros like New York, Washington, and Boston. Information/Technology metros rank second in the order of economic base groupings, with \$344.9 billion, with two Tier 2 markets (Austin and Seattle) joined by three Tier 3 markets (Atlanta, Raleigh, and San Jose). Cities with a concentration in Finance are a distant third with \$167.6 billion in aggregate investment, largely attributable to three Tier 3 markets (Charlotte, Dallas, and Phoenix). Sorted by Growth/Volatility metrics,

the left-most column (Average Volatility/Low Growth) represents the greatest total sales volume (\$372.4 billion) because of New York and Boston. The High Volatility/High Growth column at the far right of the matrix ranks second total volume at \$317.6 billion, powered by the Finance and Info/Tech metros. And Info/Tech also generated the third-ranked grouping of High Volatility/Low Growth investment at \$182.4 billion. In general, then, the aggregate investment distribution is consonant with the per-capita patterns, with the added influence of metro area size taken into account.

Table 5: Economic Location Matrix (Investment in Millions of Dollars)

Structure (LQ) & Transaction Volume	Avg. Volatility/ Low Growth	Avg. Volatility/ Avg. Growth	Avg. Volatility/ High Growth	High Volatility/ Low Growth	High Volatility/ Avg. Growth	High Volatility/ High Growth
	372,438	141,987	47,710	182,375	96,890	317,589
<b>Diversified</b> 398,583	254,259	75,937			27,141	41,246
<b>Mfg. Capital Goods</b> 7,731	7,731					
<b>Mfg. Consumer Goods</b> 5,244	5,244					
<b>Energy</b> 36,745			36,745			
<b>Trade/Transportation</b> 45,715					24,162	21,553
<b>Information/Technology</b> 344,928		43,787		182,375	17,255	101,511
<b>Finance</b> 167,612	2,743	22,263	10,965		17,112	114,529
<b>Professional/Business Services</b> 70,134	70,134					
<b>Education/Health</b> 32,327	32,327					
<b>Leisure/Hospitality</b> 38,750						38,750
<b>Government</b> 11,220					11,220	

## HOUSING PRICES AS A FACTOR IN METRO ATTRACTIVENESS

Low costs are often cited as an important competitive advantage for metropolitan areas. High home prices, in particular, are considered by some to be a disincentive to economic growth since they may make it more difficult for firms to attract or retain workers, or may require firms to raise levels of compensation to meet the high cost of home ownership. If true, such a supposition would be expected to find a reflection in commercial property investment trends, as purchases of such property represent a view of future economic growth, expressed in an implicit projection of property utilization and income potential.

At first glance, such assumptions appear difficult to maintain. If home prices are influenced by household capital allocations (that is, if home prices are a measure of households' willingness and ability to invest), then the metro areas with currently high existing home prices not only match up well with those with strong commercial investment flows (as indicated in Table 1) but with those with the best commercial property investment per-capita (Table 3).

It should not be puzzling to see concomitantly strong investment flows in a metro area's commercial and residential real estate sectors. Here are the top ten home price metros, listed by Vibrancy Tiers, with the numbers in parentheses indicating (home price rank, three-year commercial investment rank, commercial investment per-capita): Tier 1: San Francisco (2,5,3); Boston (6,8,9); Washington (8,6,7); New York (9,1,2); Tier 2: Los Angeles (4,2,18); Seattle (5,9,6); Portland (10,21,16); Tier 3: San Jose (1,13,1); Denver (7,12,4). It is evident that seven of eight Tier 1 and Tier 2 markets listed ranked in the top ten for both home prices and for commercial investment volume. When corrected for population size, the story is largely the same, with only

Los Angeles slipping when investment per-capita is considered in addition to aggregate dollar volume. But the Tier 3 markets of San Jose and Denver find themselves in the top ten ranks for both home prices and for per-capita commercial investment.

Contrast this with the bottom ten markets in 2017 home prices. All such markets are in the Tier 3 of the Vibrancy scale. Here are the results for the ten lowest priced housing markets: Cleveland (38,37,38); Cincinnati (37,35,36); St. Louis (36,32,34); Indianapolis (35,31,30); Columbus (34,34,32); Kansas City (33,30,29); Atlanta (32,7,10); San Antonio (31,29,27); Tampa (30,22,22); Charlotte (29,23,17). Of this group, only Atlanta converts low home prices into significantly high commercial investment flows. There does not appear to be a strong case that low housing prices indicate investor expectations of future metro economic performance as reflected in commercial property investment flows.

An interesting nuance is introduced when home price change over time is considered (Table 6). Six of the ten metros with the lowest home prices in 2017 also reflect very low rates of housing appreciation since 1991. This makes a good deal of sense, *prima facie*, as residential purchasers are likely to take appreciation history into account when considering current price. Only San Antonio, ranked 31st in 2017 price, breaks into the top ten appreciation markets for housing over the 1991–2017 time span. Similarly, five of the markets with the highest 2017 housing prices also rank in the top ten for 1991–2017 home price appreciation, reflecting the same logic. Only New York stands as a high-priced housing market with a relatively low appreciation rate.

Table 6: 2017 Top Ten and Bottom Ten Metros by Home Prices and Price Change<sup>18</sup>

Rank	Metro	2017 Existing Home Price (thousands of dollars)	Vibrancy Tier	Rank	Metro	Price Change, 1991–2017 (%)	Vibrancy Tier
1	San Jose	\$1,180	3	1	San Jose	372.0%	3
2	San Francisco	\$900	1	2	Denver	365.4%	3
3	San Diego	\$599	3	3	Portland	338.3%	2
4	Los Angeles	\$551	2	4	Salt Lake City	312.2%	3
5	Seattle	\$466	2	5	Seattle	277.8%	2
6	Boston	\$453	1	6	Austin	269.8%	2
7	Denver	\$415	3	7	Miami	256.8%	2
8	Washington DC	\$407	1	8	San Francisco	248.2%	1
9	New York	\$383	1	9	San Antonio	234.7%	3
10	Portland	\$382	2	10	Raleigh	224.2%	3
29	Charlotte	\$227	3	29	New York	135.1%	1
30	Tampa	\$220	3	30	Atlanta	126.6%	3
31	San Antonio	\$217	3	31	Columbus	122.9%	3
32	Atlanta	\$198	3	32	Indianapolis	116.8%	3
33	Kansas City	\$195	3	33	Chicago	104.2%	1
34	Columbus	\$190	3	34	St. Louis	100.2%	3
35	Indianapolis	\$172	3	35	Philadelphia	98.6%	1
36	St. Louis	\$169	3	36	Cincinnati	90.8%	3
37	Cincinnati	\$162	3	37	Cleveland	62.9%	3
38	Cleveland	\$140	3	38	Hartford	52.3%	3

It might be remarked that housing's cyclical rebound may be interacting with the softening of commercial real estate investment flows. Strong per-capita commercial flows (Table 2) into markets like San Jose, San Francisco, Denver, Austin, Seattle, and Raleigh could be influencing the above-average increases in home values in those metros. Likewise, weak per-capita commercial volumes are associated with weak appreciation in housing prices

in Columbus, Indianapolis, St. Louis, Philadelphia, Cincinnati, Cleveland, and Hartford. Note, too, the presence of a number of Tier 3 Vibrancy metros at both the top and the bottom of the scale. Although the sample size is too small to support reliable statistical significance, the frequency of close association of rankings between the commercial and residential real estate sectors does not seem to be purely coincidental.

## STATE AND LOCAL TAXES RELATED TO COMMERCIAL/RESIDENTIAL REAL ESTATE

There may no greater litmus test of political ideology than the question of taxation. There are those for whom the only correct direction of change in taxes is downward. Others see taxes as nothing other than a synonym for the public revenue that funds desirable public services, and are more than willing to accept a higher tax bill if it means increased provision of services. Like most important questions in life,

the issue of taxes is complex and there is little likelihood that positions on either extreme are even close to the truth.

To shift the domain of the test from ideology to economics, it is useful to relate a measure of state and local taxation to the evidence of capital flows and pricing in real estate. Real estate has the virtue of being an asset fixed to location, and the desirability of that asset may or may not reflect the level

<sup>18</sup> Existing Home Sales Data from National Association of Realtors®

of taxation. Let's examine some of the numbers as displayed in Table 7. If low taxes are indeed a desideratum of commercial and residential real estate purchasers, there should be a strong inverse relationship between the rank order of

state and local taxes (highest to lowest) and the order of commercial capital flows and/or the level of prices in the housing market.

Table 7: State and Local Taxes and Real Estate Indicators<sup>19</sup>

State	State & Local Per Capita Tax Collections	Rank Among 50 States	Metro Real Estate Ranks (per capita commercial investment volume 2015–2017, home prices 2017) Among 38 Metros
Arizona	\$3,480	45	Phoenix (15,22)
California	\$5,842	10	Los Angeles (18,4), Riverside (26,12), Sacramento (25,11), San Diego (14,3), San Francisco (3,2), San Jose (1,1)
Colorado	\$4,592	22	Denver (4,7)
Connecticut	\$7,410	3	Hartford (37,27)
District of Columbia	\$10,576	1	Washington, DC (7,8)
Florida	\$3,448	46	Miami (31,13), Orlando (13,23), Tampa (22,30)
Georgia	\$3,515	43	Atlanta (10,32)
Illinois	\$5,742	12	Chicago (19,20)
Indiana	\$3,835	36	Indianapolis (30,35)
Maryland	\$5,846	9	Baltimore (24,17)
Massachusetts	\$6,339	6	Boston (9,6)
Minnesota	\$5,946	8	Minneapolis (28,19)
Missouri	\$3,644	41	Kansas City (29,33), St. Louis (34,36)
Nevada	\$4,099	29	Las Vegas (12,18)
New York	\$8,722	2	New York (2,9)
North Carolina	\$3,788	37	Charlotte (17,29), Raleigh (8,16)
Ohio	\$4,414	24	Cincinnati (36,37), Cleveland (38,38), Columbus (32,34)
Oregon	\$4,360	26	Portland (16, 10)
Pennsylvania	\$4,950	16	Philadelphia (33,28)
Tennessee	\$3,268	49	Nashville (20,24)
Texas	\$4,120	38	Austin (5,15), Dallas (11,21), Houston (23,26), San Antonio (27,31)
Utah	\$3,622	42	Salt Lake City (21,14)
Washington (state)	\$4,765	17	Seattle (6,5)
Wisconsin	\$4,661	20	Milwaukee (35,25)

It is not possible to see such a relationship in the data included in Table 7. Places<sup>20</sup> with very high ranks for taxation (e.g., the District of Columbia [1]; New York [2]; Connecticut [3]; and Massachusetts [6]) should be finding it hard to attract real estate buyers. But – except for Hartford, CT – exactly the opposite seems to be the case. Washington DC, New York, and Boston have commercial transaction volumes and home prices ranking in the top

ten of the 38 metros considered in this study. States like Minnesota [8] and Maryland [9] have less robust real estate performance, but still we find Minneapolis and Baltimore having mid-range capital flows and home prices.

Turning the table upside down, the “low taxes are better” hypothesis would suggest that states with tax rankings in the 40s should be showing signs of capital magnetism. What

<sup>19</sup> The Tax Foundation (tax data), RCA (commercial real estate); NAR (home prices)

<sup>20</sup> It is important to note that many CBSA metros extend across state lines. Table 5 adopts the convention of identifying the metro area with the state that is home to its core city.

do we find? A mixed story. The relevant states are Missouri [41], Utah [42], Georgia [43], Arizona [45], Florida [46], and Tennessee [49]. Most of the metros in these states rank in the mid-range for real estate measures. Only Atlanta fits the expected outcome of strong capital flows (ranking 10th), but even this metro has weak housing prices (ranking 32nd). Missouri's metros (St. Louis and Kansas City) are in the bottom ten on both real estate measures.

Most generously, the “low taxes are better” hypothesis can be said to be “unproven” by these data. This should

## NEXT QUESTIONS

Titling this paper “Under the Radar” is an attempt to look at a number of issues not previously considered in the urban real estate research. While much attention has been accorded the Tier 1 and Tier 2 Vibrancy metros, often under the rubric of “24-hour and 18-hour cities,” the Tier 3 markets have received a cursory look, if that. Yet it appears that there are significant performance differences among the Tier 3 markets.

For one thing, of the 25 Tier 3 Vibrancy metros, twelve have between 1.1% and 4.2% of total U.S. commercial property investment sales in the 2015 – 2017 period. Thirteen metros fell below the 1.0% threshold, varying between 0.2% and 0.9%. Of the twelve relatively active Tier 3 markets, nine also registered sales volume per-capita above the U.S. average of \$6,971. Those markets (in order of total volume) were Dallas, Atlanta, Houston, Phoenix, Denver, San Jose, San Diego, Orlando, and Las Vegas. A deeper analysis is indicated to explore why these nine markets, and not the other Tier 3 metros, achieved high capital inflows despite comparatively low Vibrancy scores. Since they are situated in seven different cells in the Economic Location Matrix, economic structure, growth, and volatility characteristics do not appear to yield the answer.

On the other hand, why is it that Tier 1 and Tier 2 Vibrancy metros like Philadelphia, Chicago, Portland, Minneapolis, and Baltimore fail to generate greater volumes of commercial property investment, either in the aggregate or on a per-capita basis? Could a cluster analysis point to some explanatory elements not captured in the Vibrancy scores?

Might a more discrete analysis of the components of sales volume, by property type, shed any light on the unexpected

not be surprising. In a complex economy, no silver bullet explanation of cause and effect is likely to be sufficient. The very nature of ideology is an attempt to fit facts to beliefs, rather than the other way around. The taxes and housing costs argument that characterizes New York, Chicago, San Francisco, Los Angeles, and Seattle as “falling stars”, being supplanted by “opportunity boomtowns” like Dallas, Charlotte, Austin, Nashville, Phoenix, Denver, and Philadelphia, has yet to be validated in the investment data.<sup>21</sup>

distribution of overall sales? Does the comparative weight of the core city versus suburbs enter into the picture? Could population density or demographic structure provide the clues?

Previous research has shown that the three Vibrancy Tiers sort themselves nicely in measures of cumulative total returns on the NCREIF index for the office property type. And that research has shown that multifamily properties show significant convergence for all the Tiers, especially since the Global Financial Crisis. What can be discovered when the retail and industrial property types are considered?<sup>22</sup> And, if Vibrancy shows strong explanatory power for some property types and not others, what reasons can be adduced by empirical research to elucidate the differences?

Rigorous research into the “24-hour city” and related paradigms is still in its infancy. The 24-hour city concept was first articulated in the real estate industry literature in 1995, but it was not until 2013 that first substantive paper on the subject was published in an academic journal. There is much to be learned. It is hoped that more researchers will be motivated to explore this field, providing fresh perspectives and innovative approaches to an important topic. After all, in the 2015–2017 period alone, approximate \$1.5 trillion was spent on commercial properties. From both a finance and an urban studies point of view, there is a lot riding on the advancement of knowledge in this area.

21 Kotkin, J., art. cit.

22 Kelly, H. and E. Malizia, art. cit.



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# THE MARKET FOR MANUFACTURED HOMES

**Scholastica (Gay) D. Cororaton, CBE**

*Research Economist, National Association of REALTORS®<sup>1</sup>*  
*scororaton@realtors.org*

## ABSTRACT

*Mobile/manufactured homes were a popular form of affordable housing in the '60's and '70s, but until 1976, the industry was minimally regulated, resulting in concerns about their safety, quality, and durability. Tighter design and installation standards after 1976 have improved the stock of mobile/manufactured housing. Built at lower cost than site-built properties, households in mobile/manufactured homes are less cost-burdened, with 71 percent owning their homes. However, households who do not own the land will likely accumulate less wealth compared with households who own the land, which tends to appreciate in value. States regulate the titling of manufactured homes, with only 22 states allowing mobile/manufactured homes to be titled as real estate. If more states allow manufactured homes on private property to be titled as real estate, manufactured homes will become even more affordable.*

**Keywords:** *manufactured/mobile homes, standards, affordability, chattel financing*

The usage of manufactured homes, more commonly known as mobile/manufactured homes, has dramatically declined since the 1960s when they were viewed as an affordable type of housing for long-term use. Concerns about their quality, durability, and safety, especially among units built prior to 1976, and the wider use of this type of housing among lower income households have stigmatized their use. Also, the easier access to mortgage financing for traditional site-built homes during 2000–2007 drew away demand

for manufactured homes. However, since 2012, there has been a slow rise in demand for manufactured housing as traditional site-built homes have increasingly become less affordable.

The objective of the paper is to assess the characteristics of demand for, and supply of, manufactured housing and to evaluate the role of mobile/manufactured housing in providing safe, quality, and affordable housing, especially for lower income households.

## TERMINOLOGY

Manufactured homes today are much different from the mobile homes or trailer homes that existed prior to 1976. Starting on June 16, 1976, only manufactured homes that meet strict regulatory standards can be shipped out of factories and designated as manufactured homes.

Prior to 1974, mobile/manufactured homes were subject only to state regulation, with no federal standards to ensure the same level of quality, safety, and durability across states.

In 1974, Congress passed the National Manufactured Home Construction and Safety Standards Act and tasked the Department of Housing and Urban Development (HUD) with implementing the Act that set federal standards. HUD's standards are codified as Title 24 Code of Federal Regulations Part 3280, Manufactured Home Construction and Safety Standards (the Standards).<sup>2</sup>

The Standards defines a manufactured home:

1 The views and findings in this report are those of the author and should not be attributed to nor viewed as a policy of the National Association of Realtors®. The author thanks Dr. Lawrence Yun, Chief Economist and Senior Vice-President, Research, NAR, for initiating this study; Jenny Hodge, Vice President – Research & Market Analysis, Kara Beigay, Senior Director of Government Affairs, and Marc Lifset, Consultant, of the Manufactured Housing Institute for their invaluable comments on the earlier draft and industry insights; Dr. Paul Bishop, Vice President, Research and Ken Fears, Senior Policy Representative, Public Policy Analytics, NAR, and Caroline Van Hollen, Manager, Strategic Planning, for their thorough review and comments on the earlier draft. All errors are to be attributed to the author.

2 Government Publishing Office, Electronic Code of Federal Regulations, <https://www.ecfr.gov>.

*“A manufactured home means a structure, transportable in one or more sections, which in the traveling mode is 8 body feet or more in width or 40 body feet or more in length or which when erected on-site is 320 or more square feet, and which is built on a permanent chassis and designed to be used as a dwelling with or without a permanent foundation when connected to the required utilities, and includes the plumbing, heating, air-conditioning, and electrical systems contained in the structure.”*

Only manufactured housing that meets the Standards, as certified by a certification label (also called a “red tag” or “HUD label”) can be shipped from the manufacturing plant. However, because the housing stock can consist of mobile/manufactured homes that were built prior to 1976 Standards, this paper uses the term “mobile/manufactured homes,” but cautions the reader to take note that mobile homes that were built before June 16, 1976 do not likely stand up to the definition of a manufactured home as defined in the Standards. The use of the term “mobile homes” is in line with the U.S. Census Bureau’s nomenclature in the American Community Survey and in the American Housing Survey. The U.S. Census Bureau also

refers to manufactured home shipments as “manufacturer’s shipments of mobile/manufactured homes.” Again, the important thing to note is that only mobile/manufactured homes shipped on or after June 16, 1976 and that have a certification label can be technically (and legally) called manufactured homes.

Modular homes are primarily different from manufactured homes in that: 1) modular homes are constructed according to state and local building codes (like site-built homes) while manufactured homes are built to HUD standards; and 2) mobile/manufactured homes are built on a permanent chassis while modular home sections are not built on a chassis. Another difference is that modular homes tend to be larger and can be designed more flexibly than manufactured homes. Both modular and manufactured homes sections are transported to the site and are then secured together at the site. Another type of pre-fabricated home is a panel building. Panels are walls with windows and doors already installed, which are then put together on the site. A panel building is constructed by laying down the floor and then lowering each section of wall in place one at a time.

## TRENDS IN THE DEMAND FOR MOBILE/MANUFACTURED HOMES: 1960-2017

Mobile/manufactured homes became increasingly popular during the 1960’s and 1970’s as an inexpensive form of housing.<sup>3</sup> Advertising<sup>4</sup> and the introduction of larger units, from 8-foot-wide to 12-foot wide in the late 60’s<sup>5</sup>, increased their attractiveness as an alternative to site-built traditional homes. With their growing popularity, shipments

of mobile/manufactured homes quintupled from 120,000 units in 1959 to 580,000 by 1973 and accounted for 16 percent of single-family home sales (new 1-family, existing 1-family, and mobile/manufactured) and 34 percent of new single-family housing stock (new 1-family housing starts and mobile/manufactured shipments) (Figures 1, 2).

3 The reader should bear in mind that after 1976, only manufactured homes that meet the Standards can be called manufactured homes.

4 Click Americana Memories and Memorabilia, “Mobile Homes: The Hot Housing Trend of the ‘50s and ‘60s”, <https://clickamericana.com/topics/home-garden/mobile-homes-hot-housing-trend-50s-60s>

5 Joel G. Olsen, Productivity Trends in the Mobile/manufactured Homes Industry. *Monthly Labor Review*, 1977, p.15.

Figure 1: Mobile/Manufactured Home Shipments and Home Sales (in Thousands)<sup>6</sup>

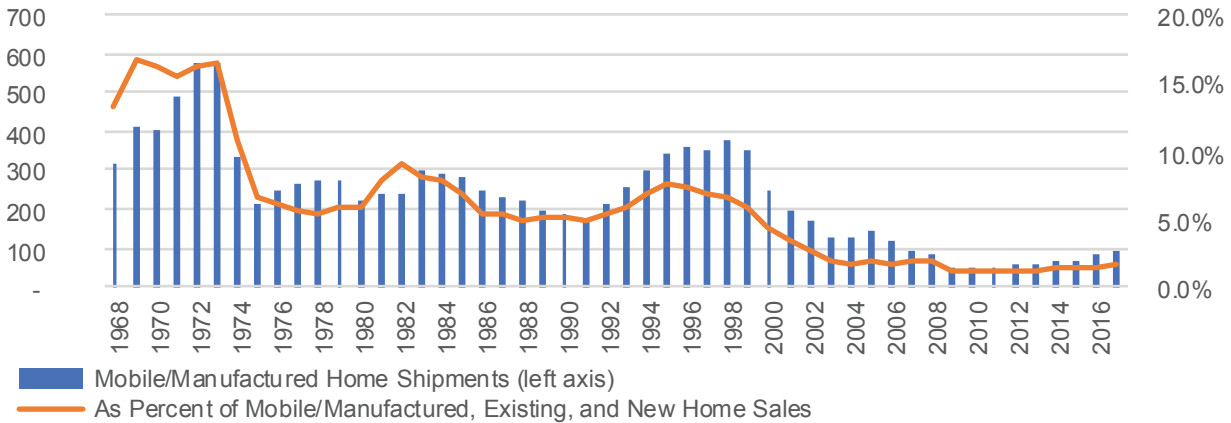
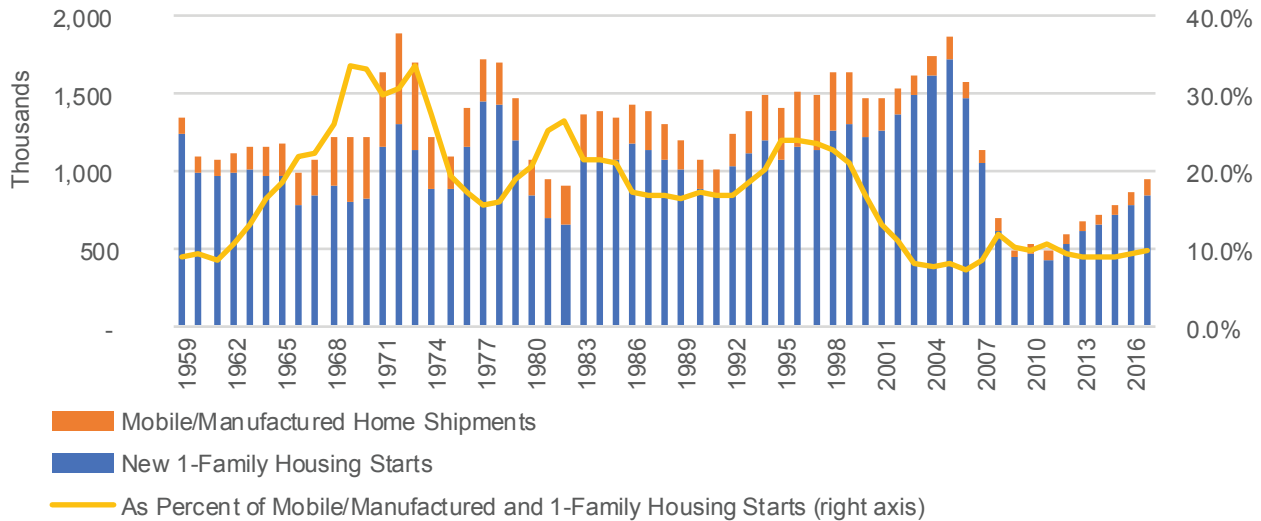


Figure 2: Mobile/Manufactured Home Shipments and Private Housing Starts (in Thousands)<sup>7</sup>



The period 1974–1991 was a tough time for the mobile/manufactured homes industry and for the housing sector, in general, with the global and U.S. economy buffeted by three oil shocks. These oil shocks reverberated across the U.S. economy by way of their impact on inflation, interest rates, and employment. The mobile/manufactured homes industry also faced increasing competition from rising condominium construction, another affordable housing option. The greater competition led many manufacturing plants to close. The implementation of the HUD standards

for mobile/manufactured homes in 1976 also resulted in many mergers and acquisitions<sup>8</sup>. All these forces combined to decrease the supply of, and demand for, manufactured homes. During 1974 through 1991, the volume of shipments averaged 250,000 units, about half the volume in 1973.

The low interest rate environment during 1991 through 2005 led to a boom in the real estate industry. Shipments of manufactured homes rose from 170,900 in 1991 to

6 U.S. Census Bureau, NAR

7 U.S. Census Bureau, NAR

8 Ibid.

373,100 in 1998. Larger units measuring 16-foot wide and 18-foot wide were produced as states allowed the transport of larger units, which also helped bolster demand for mobile/manufactured homes.<sup>9</sup>

Shipments of manufactured homes declined from 1999 through 2010, with shipments falling to about one-sixth, from 373,100 units in 1998 to just nearly 50,000 in 2009, or 1.2 percent of single-family home sales and 10.1 percent of new single-family housing. One reason for the decline in manufactured home purchases after 1998 was the collapse of the secondary market for manufactured housing loans, shrinking the financing for this market. The collapse was brought about by loose lending standards that led to large losses on securities backed by manufactured housing loans.

## DEMAND CHARACTERISTICS

### Primary Markets

As of 2016, there were 8.4 million mobile/manufactured homes (either occupied or vacant), or 6.2 percent of the total 135.7 million housing units. Among occupied units, there were 6.6 million households living in mobile/manufactured housing units, or 5.6 percent of the 118.9 million occupied housing units.<sup>11</sup> Of the 6.6 million households in mobile/manufactured homes, 4.7 million (71 percent) were owner-occupied, while 1.9 million were renter-occupied.

Another reason was the shift towards traditional site-built housing as relaxed lending guidelines and a low interest rate environment enabled even those who would not have qualified under tighter standards to obtain a mortgage.<sup>10</sup>

Shipments of manufactured homes have been trending upwards, from 50,000 in 2010 to 92,902 by 2017. Rising home prices for existing and new homes, which make them more unaffordable, may explain much of the increased demand for less expensive manufactured homes. Manufactured homes accounted for 1.7 percent of total single-family sales in 2017 (1.2 percent in 2010) and 9.9 percent of new single-family housing stock (9.6 percent in 2010).

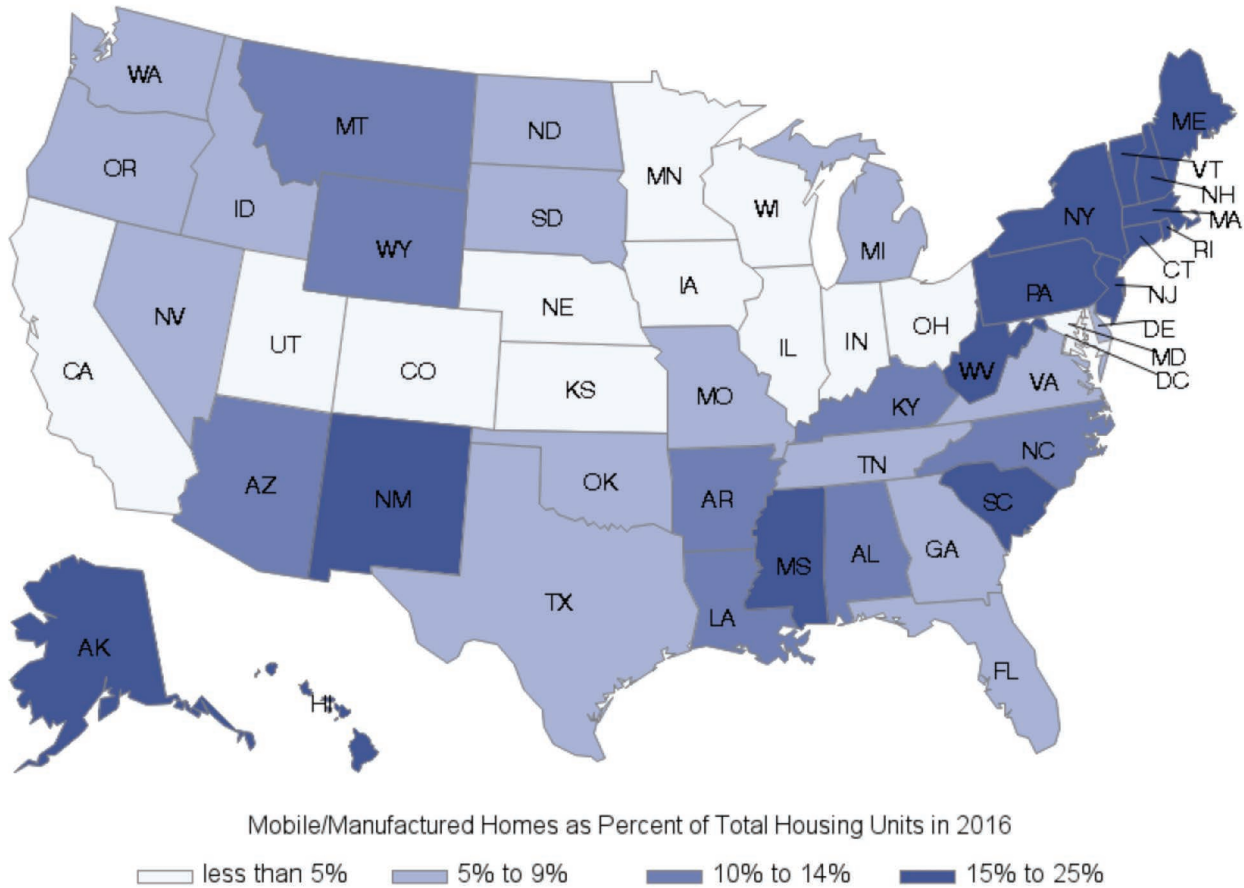
As of 2016, the South region accounted for 59 percent of the stock of mobile/manufactured housing units, followed by the West region (20 percent), the Midwest (15 percent), and the Northeast (seven percent). Mobile/manufactured homes accounted for 15 to 25 percent of housing stock in the Northeast states, West Virginia, South Carolina, Mississippi, New Mexico, Alaska, and Hawaii (Map 1).

9 Ibid.

10 Consumer Financial Protection Bureau, *Manufactured-housing Consumer Finance in the United States*, September 2014, [https://files.consumerfinance.gov/f/201409\\_cfpb\\_report\\_manufactured-housing.pdf](https://files.consumerfinance.gov/f/201409_cfpb_report_manufactured-housing.pdf)

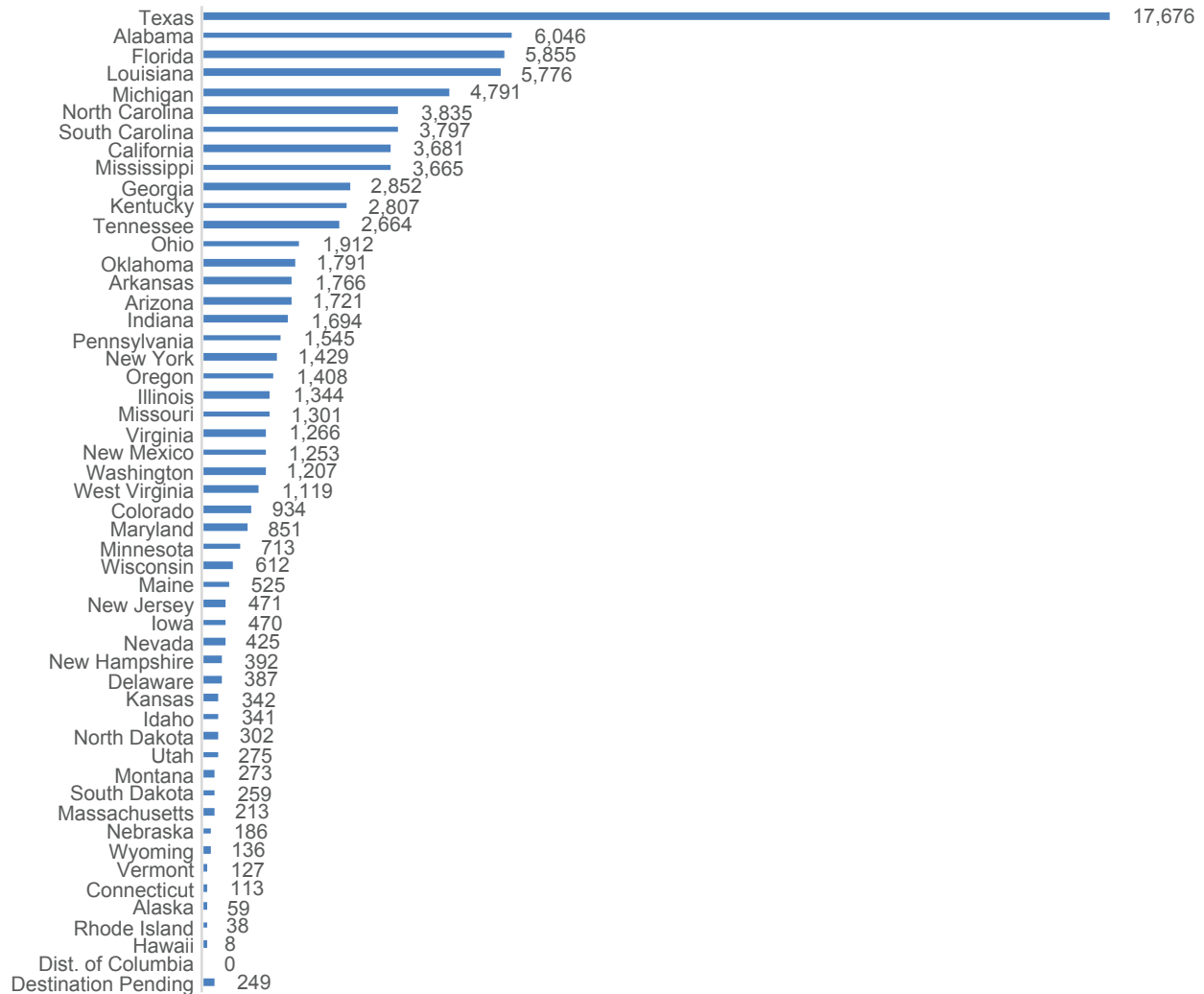
11 Source: U.S. Census Bureau, 2016 American Community Survey, 1-year estimates. The 2015 American Housing Survey (AHS) also provides an estimate of the stock of manufactured homes. In 2015, AHS estimated 5.8 million occupied manufactured homes, or 7.9 percent of 74.4 million occupied housing units. In 1993, AHS estimated 4.5 million mobile/manufactured housing units, or 7.3 percent of 61.3 million occupied housing units.

*Map 1: Mobile/Manufactured Homes as Percent of Total Housing Units in 2016*



In 2017, 92,902 manufactured homes were shipped to all states. Texas, Alabama, Florida, Louisiana, Michigan, North Carolina, South Carolina, California, Mississippi,

Georgia, Kentucky, and Tennessee accounted for two-thirds of the shipments (Figure 3).

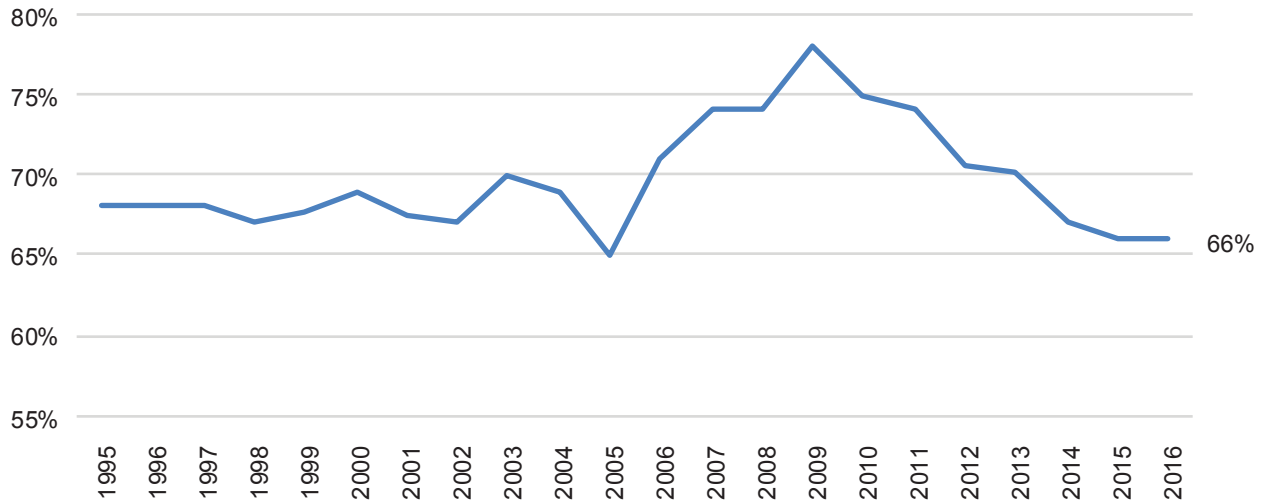
*Figure 3: Manufactured Home Shipments in 2017<sup>12</sup>*


Sixty-six percent of the shipments went to areas that are outside of manufactured home communities, or to privately owned land (Figure 4). Because mobile/manufactured homes are more affordable than site-built homes, the share of manufactured homes shipped to privately owned lands increased during the years when the housing market

collapsed and the economy went into a recession (2008–2009), from 65 percent in 2005 to 78 percent in 2009. As the economy recovered, the demand for traditional site-built homes has increased, and this may explain the decline in the share of manufactured home shipments to private property areas since 2010.

12 U.S. Census Bureau. with data provided by the Institute for Building Technology and Safety. The total may include shipments to Canada and Puerto Rico.

Figure 4: Manufactured Homes Shipped to Privately Owned Land<sup>13</sup>

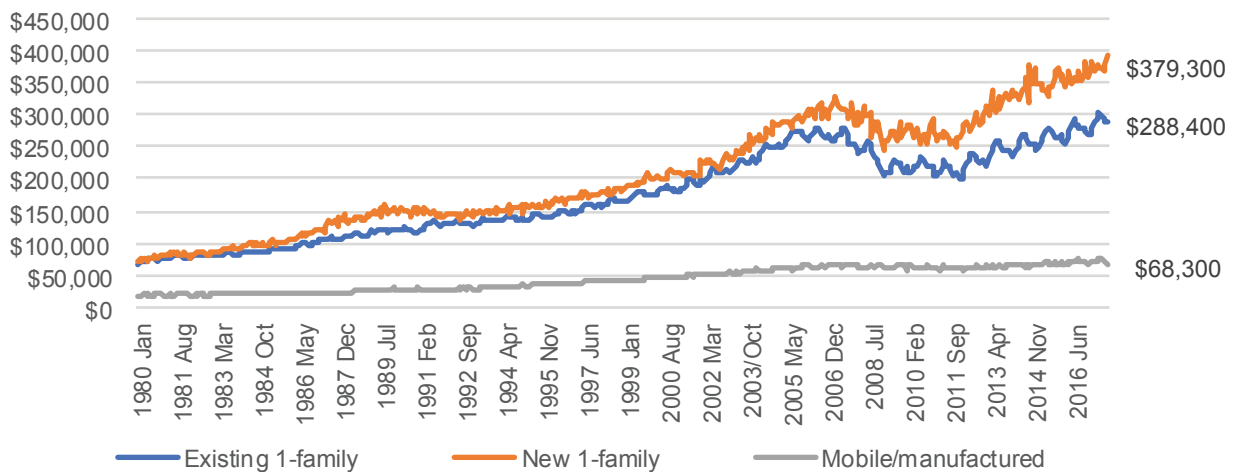


**Price of Manufactured vs. Site-built Homes**

Manufactured homes are highly affordable compared to traditional site-built homes. Based on the latest available data for manufactured homes (October 2017), the average price

of manufactured homes was \$68,300, about one-fourth of the average price of \$288,400 for an existing single-family detached home and about one-sixth of the average price of \$394,000 for a new site-built single-family home, including land cost.

Figure 5: Average Price of Existing, New, and Mobile/Manufactured Homes as of October 2017



Manufactured homes cost less to produce, with the average cost per square foot at about half the cost for a new site-built home (excluding the cost of the land) (Figure 6). In 2016, the average cost per square foot for a manufactured home was \$48.8, while the average cost per square

foot of a new site-built home, excluding land, was \$107.2. The Manufactured Housing Institute (MHI) attributes the cost savings to the efficiencies of the factory-building process. These efficiencies arise from the use of standard building materials, a controlled construction environment

13 U.S. Census Bureau



that avoids traditional home construction problems such as weather, theft, vandalism, damage to building products and materials, and unskilled labor. MHI also notes that

manufacturers have economies of scale cost savings, resulting from purchasing large quantities of materials, products and appliances.<sup>14</sup>

*Figure 6: Type, Price, and Square Footage of Manufactured Homes Shipped in 2016<sup>15</sup>*

	Average Price	Average Sq. Ft.	Cost Per Sq. Ft	Share
<b>Manufactured homes</b>				
Single-section	\$46,700	1,075	\$41.8	48%
Double-section	\$89,500	1,746	\$50.6	51%
Three or more sections	\$141,239	2,353	\$60.0	1%
Average, all manufactured homes	\$70,600	1,446	\$48.8	100%
<b>New single-family site-built home</b>	<b>\$372,500</b>	<b>2,676</b>	<b>\$107.2 (excl. land)</b>	

### Home and land ownership

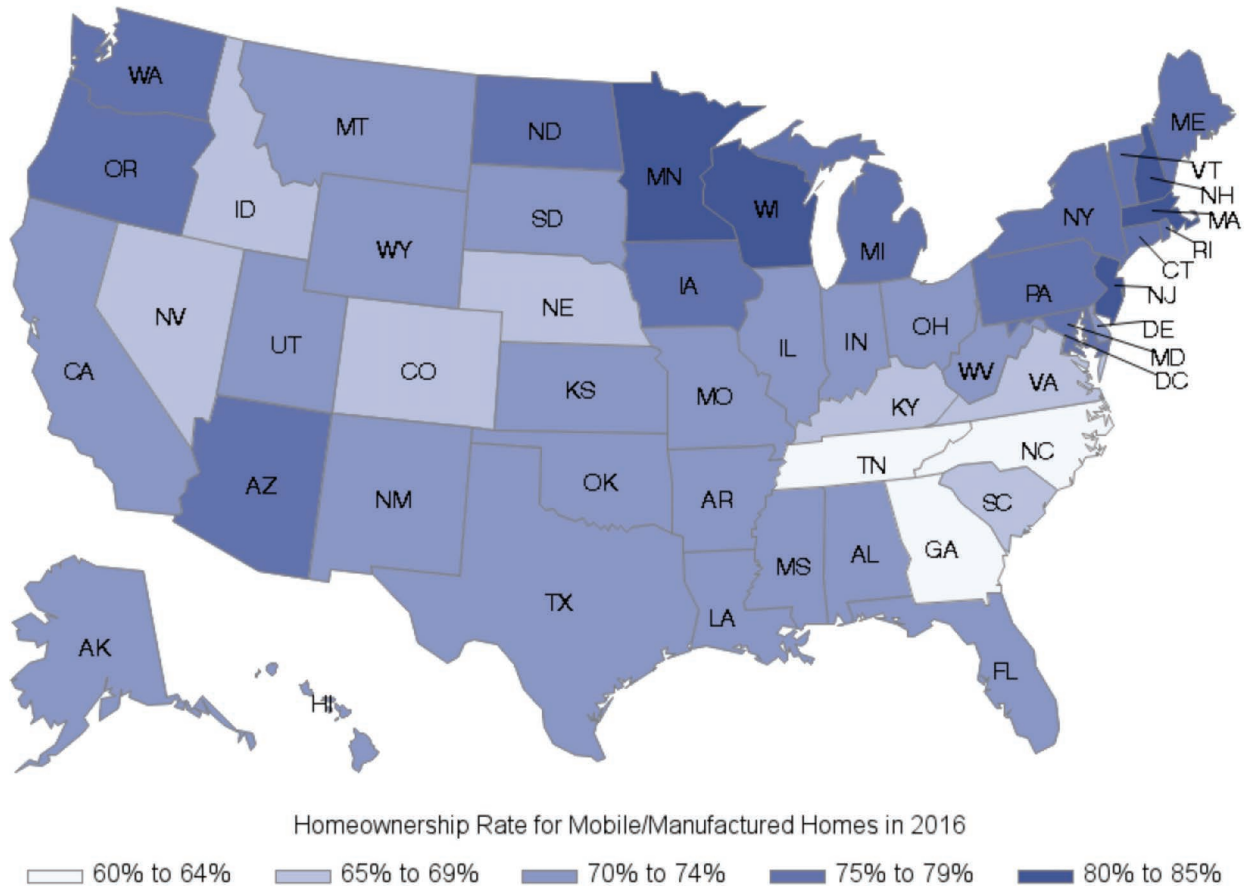
Built and priced at lower cost than site-built homes, mobile/manufactured homes have enabled lower-income households to become homeowners. The homeownership rate among mobile/manufactured homes is higher than the overall homeownership rate for all types of housing. In 2016, among occupied mobile/manufactured homes, 71 percent were owner-occupied, a higher rate than the 63 percent homeownership rate for all types of housing. In many states, the homeownership rate among mobile/

manufactured homes is significantly higher compared to the state's overall homeownership rate. In the Northeast region, the homeownership rate among mobile/manufactured homes was 74.9 percent, compared to 61.4 percent overall; in the Midwest region, 71.1 percent compared to 67.3 percent overall; in the West region, 73.5 percent compared to 58.9 percent overall; in the South region, 68.5 percent compared to 64.1 percent overall. In New Hampshire, Massachusetts, New Jersey, Minnesota, and Wisconsin, more than 80 percent of households living in mobile/manufactured units owned their homes (Map 2).

<sup>14</sup> Olsen, *supra* note 5.

<sup>15</sup> Figures for single, double, all manufactured, and site-built homes are from the U.S. Census Bureau. Three-or-more section data and the percentage of units shipped are the author's estimates from the 2016 Manufactured Housing Survey PUF. The estimated weighted average price of \$69,376 slightly differs from the official estimate of \$70,600.

*Map 2: Homeownership Rate for Mobile/Manufactured Homes in 2016*



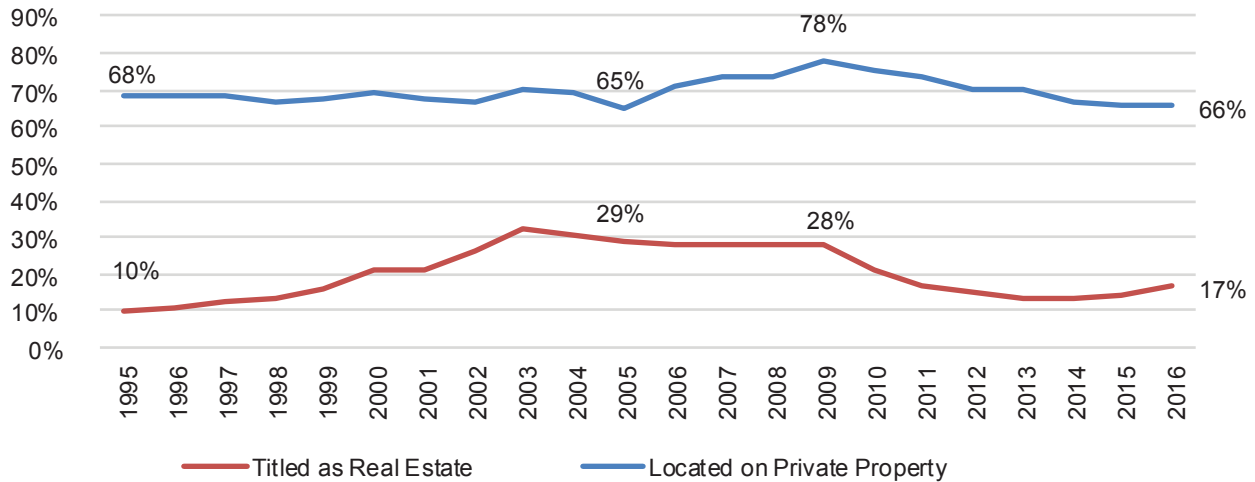
However, only 56 percent of mobile/manufactured home owners also own the land, compared to 95 percent of single-family home owners as of 2015.<sup>16</sup> In 2016, while 66 percent of manufactured homes were shipped to private property areas, only 17 percent were titled as real estate, a decline from 32 percent in 2003 (Figure 7). Mortgage financing for the acquisition of real estate is less costly than chattel financing for personal (movable) property because

mortgage financing is typically extended with longer terms (30 years versus 20 years) and at lower interest rate (typically 500 basis points less).<sup>17</sup> Also, personal property does not tend to appreciate to the same degree as real estate, so mobile/manufactured home owners who do not own the land will likely not have as much opportunity to build wealth compared with homeowners who own the land.

<sup>16</sup> Author's estimate based on the 2015 American Housing Survey, estimated using the ACS Table Creator.

<sup>17</sup> CFPB, *supra* note 8, pp. 32,36.

Figure 7: Manufactured Homes Shipped to Privately Owned Land and Titled as Real Estate<sup>18</sup>



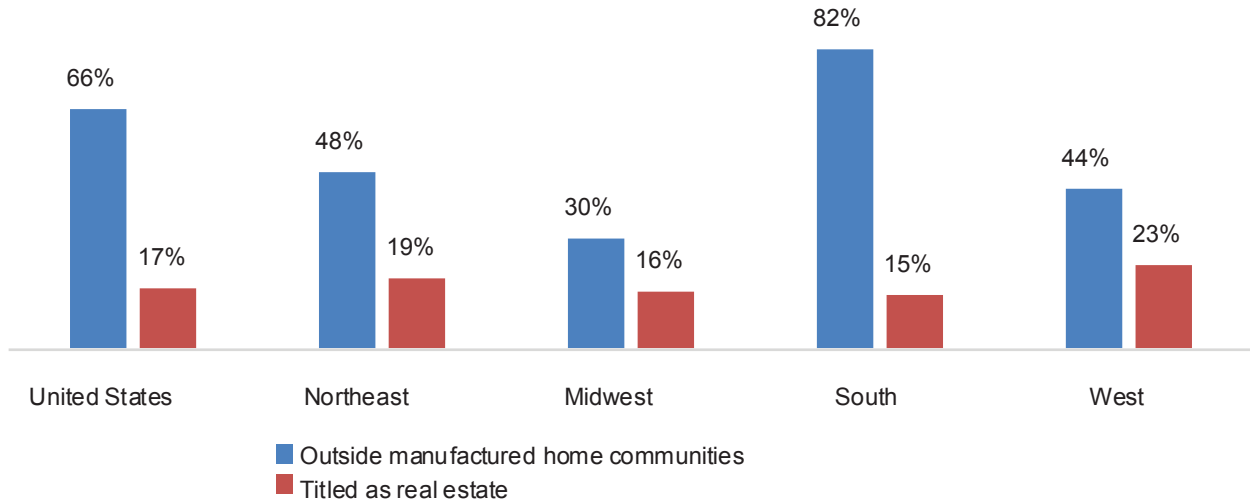
In 2016, the South region had the largest share of mobile/manufactured homes shipped to private property areas, at 82 percent (Figure 8). In the other regions, less than half of shipments went to outside manufactured home communities (private property areas). While 66 percent were shipped outside manufactured home communities, only 17 percent of shipments were titled as real estate. The West

region had the highest share of shipments that were titled as real estate, at 23 percent, compared to less than a quarter in other regions and nationally. States regulate the titling of mobile/manufactured homes as either real estate or personal property. As of 2016, 22 states allow mobile/manufactured homes to be titled as real estate or to be sited on single-family district zones (Map 3).<sup>19</sup>

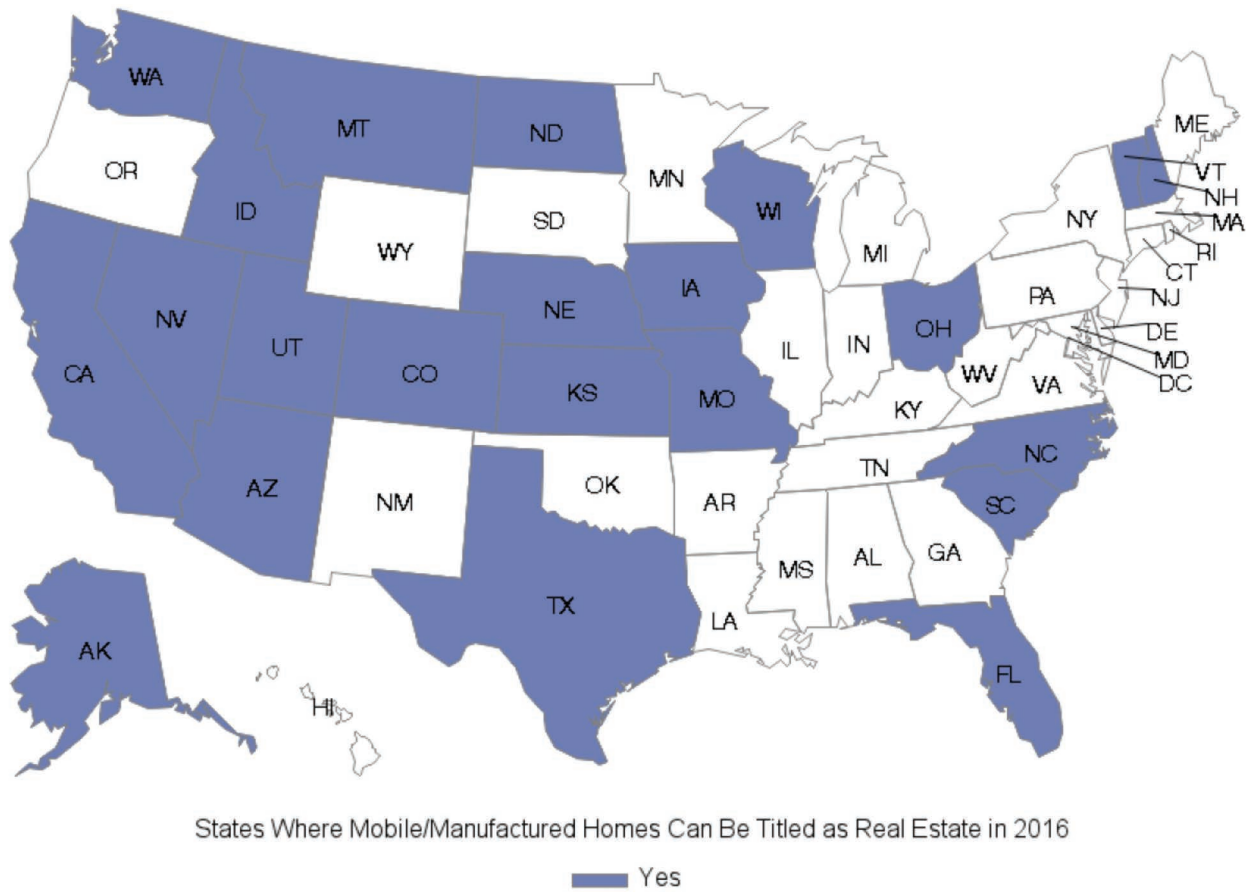
<sup>18</sup> U.S. Census Bureau

<sup>19</sup> Property Now Scorecard, Resident Ownership, Titling and Zoning of Manufactured Homes, based on data provided by John W. Van Alst and Carolyn L. Carter of the National Consumer Law Center, <http://scorecard.prosperitynow.org/2016/measure/resident-ownership-titling-and-zoning-of-manufactured-homes>

Figure 8: Location of Manufactured Homes for Residential Use and Title of Property<sup>20</sup>



Map 3: States Where Mobile/Manufactured Homes Can Be Titled as Real Estate in 2016



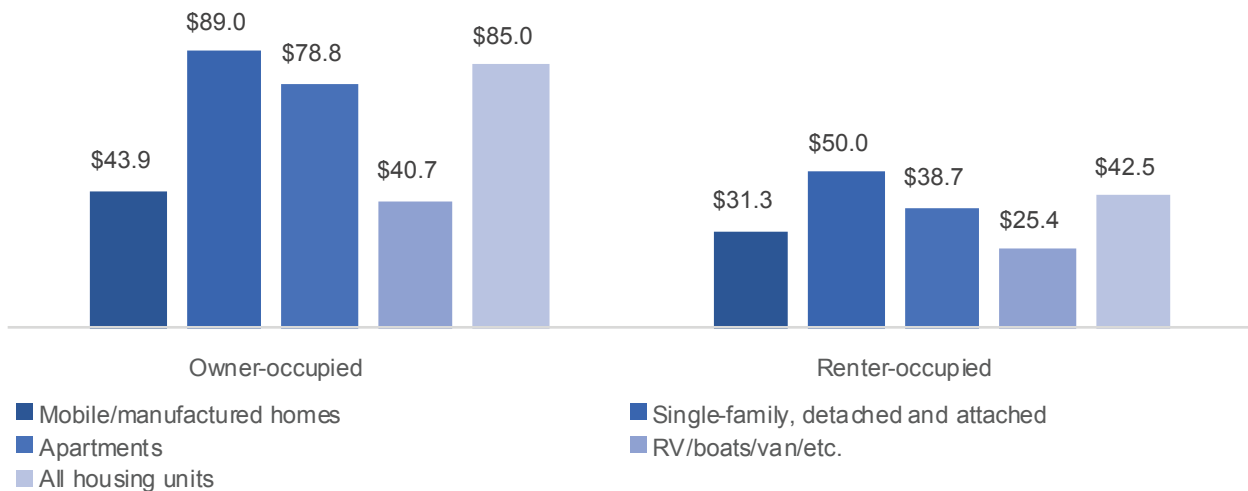
<sup>20</sup> U.S. Census Bureau

## Household Income

The median household income of households in mobile/manufactured homes is typically lower than the median household income of households living in single-family homes (detached or attached) and apartments. In 2016, the median household income among residents of owner-occupied mobile/manufactured homes was \$43,900, about half the median household income of \$89,000 among households in single-family homes. Among households

who rented the mobile/manufactured unit, the median household income was \$31,300, which was also lower than the median household income of \$50,000 among renters in single-family homes and the median household income of \$38,700 among renters in apartment units (Figure 9). Despite the lower median incomes of households in mobile/manufactured homes, 71 percent owned their homes, an indication that mobile/manufactured homes play an important role in providing the opportunity for lower-income households to become homeowners.

Figure 9: Median Household Income in 2016, by Type of Household Unit and Tenure, in Thousand Dollars<sup>21</sup>



## Housing Costs and Affordability

Households who own or rent manufactured homes have lower monthly housing costs compared to households living in single-family homes or apartment buildings.<sup>22</sup> Among mobile/manufactured home owners, the median monthly owner cost, including land cost or rent, was \$534 in 2016,

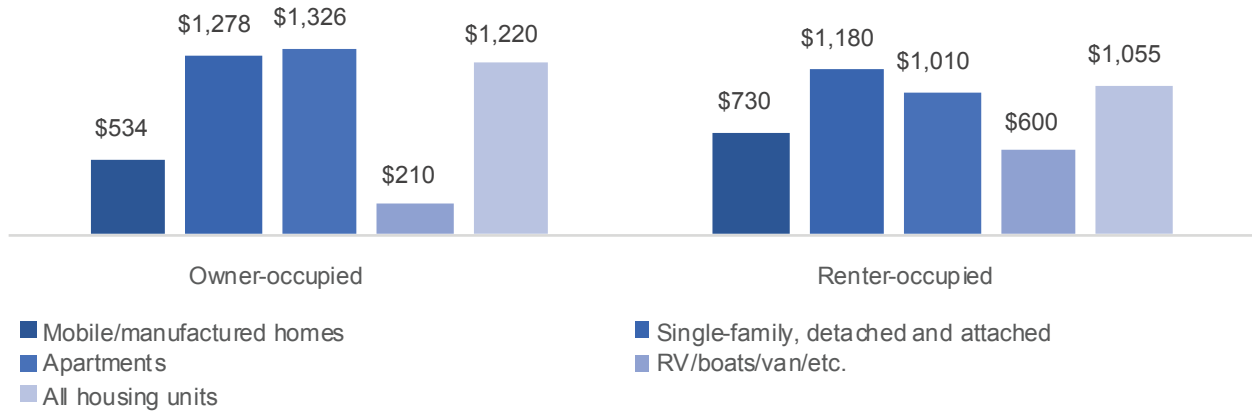
compared to \$1,278 for single-family homes and \$1,326 for owners in apartment buildings (i.e., condominiums). Among renters of mobile/manufactured homes, the median gross rent was \$730 compared to \$1,180 among households who rented apartment units (Figure 10).<sup>23</sup> Mobile/manufactured housing costs were typically below \$500 per month in many states in the South region in 2016 (Map 4).

<sup>21</sup> Author's tabulation of ACS, 2016, PUMS

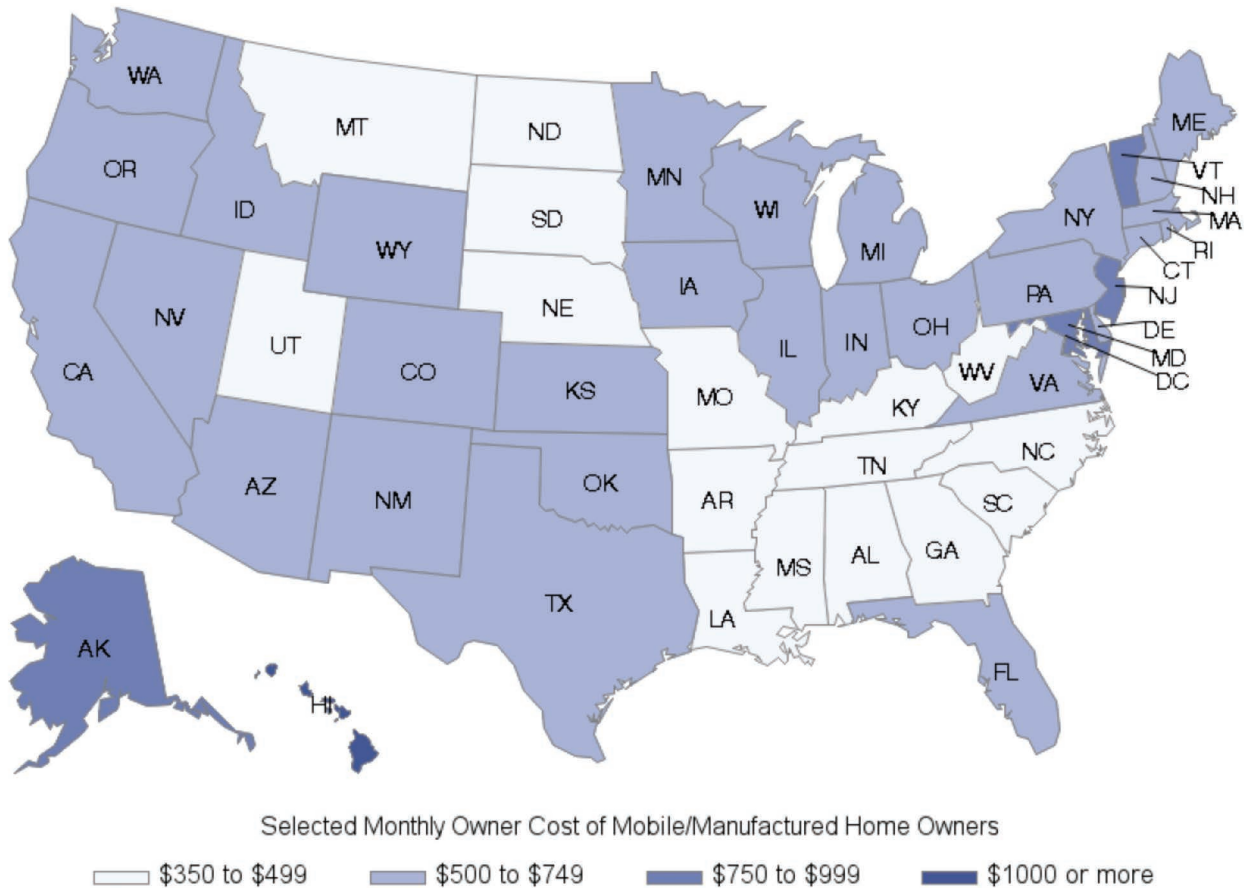
<sup>22</sup> In estimating the annual mobile/manufactured home costs, the U.S. Census Bureau includes personal property taxes, land or site rent, registration fees, and license fees on all owner-occupied mobile/manufactured homes. The U.S. Census Bureau calculates the "selected monthly owner cost" as the sum of payment for mortgages, real estate taxes, various insurances, utilities, fuels, mobile/manufactured home costs, and condominium fees.

<sup>23</sup> The U.S. Census Bureau calculates gross rent as the contract rent plus the estimated average monthly cost of utilities (electricity, gas, and water and sewer) and fuels (oil, coal, kerosene, wood, etc.) if these are paid by the renter (or paid for the renter by someone else).

Figure 10: Median Monthly Gross Rent and Selected Monthly Owner Cost in 2016, by Type of Household Unit and Tenure<sup>24</sup>



Map 4: Selected Monthly Owner Cost of Mobile/Manufactured Home Owners

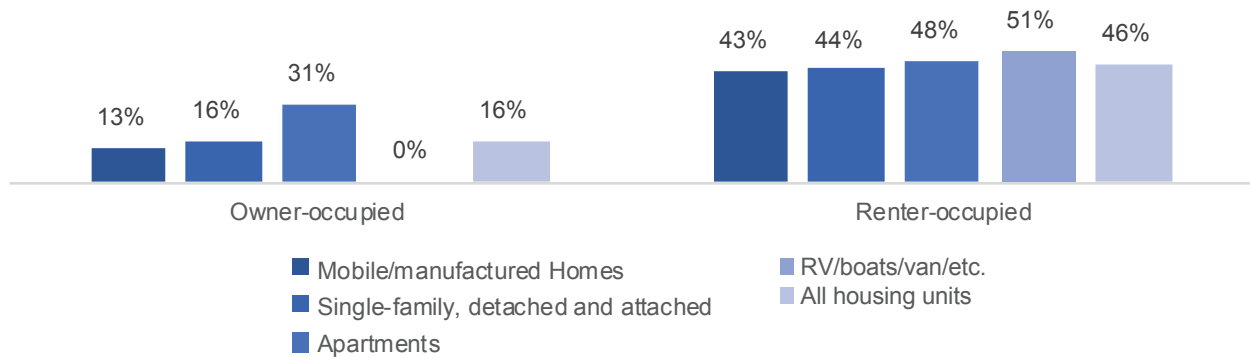


24 Author's tabulation of ACS, 2016, PUMS

A smaller fraction of mobile/manufactured home owners spend more than 30 percent of income on housing compared to owners of single-family units and apartment unit owners (e.g. condominiums).<sup>25</sup> In 2016, 13 percent of households who owned mobile/manufactured homes were cost-burdened compared to 16 percent among single-family

home owners and 31 percent for apartment-unit owners (Figure 11). In primary markets for mobile/manufactured homes, such as Texas, South Carolina, North Carolina, Kentucky, and Mississippi, housing expenditures typically accounted for 10 to 14 percent of income (Map 5).

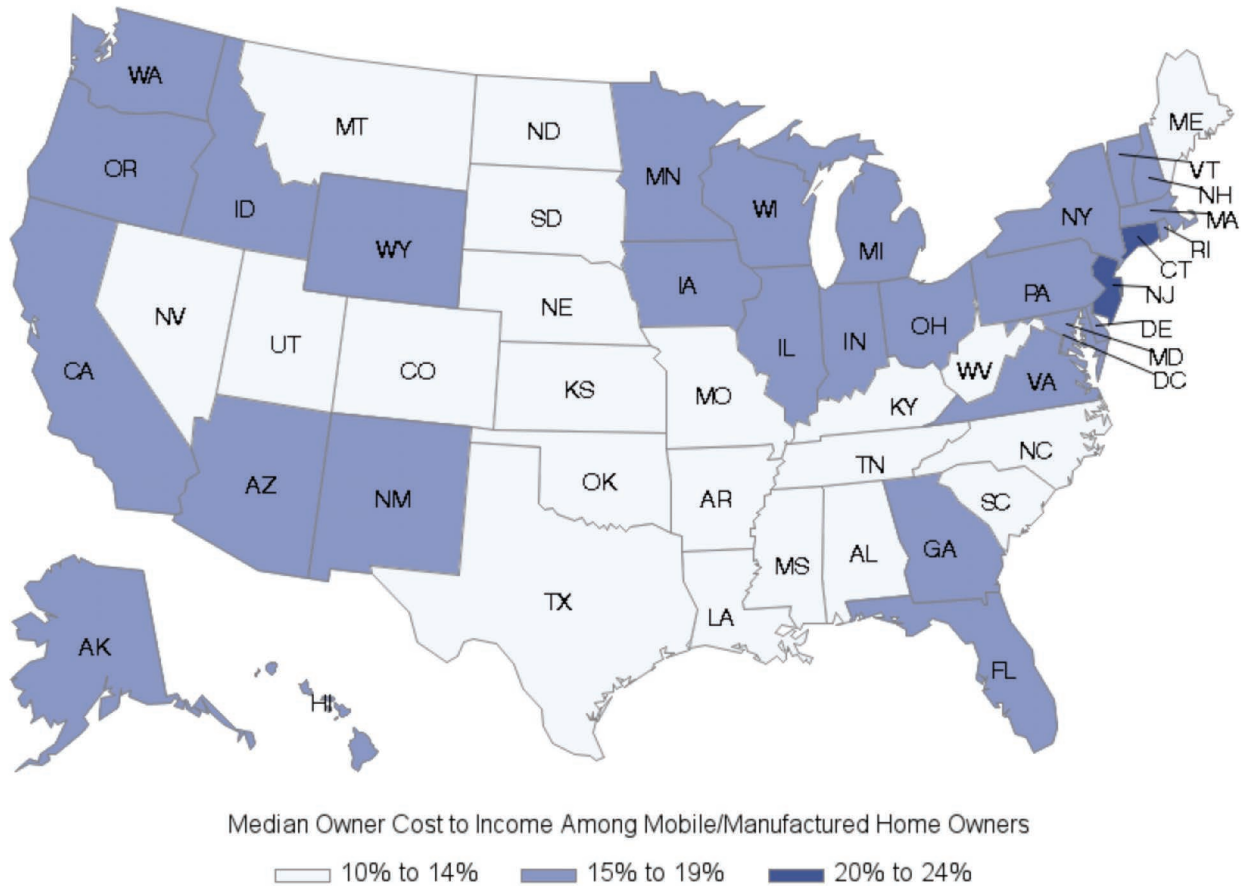
*Figure 11: Percent of Households Who Spent More Than 30 Percent of Income on Housing in 2016, by Type of Household Unit and Tenure<sup>26</sup>*



<sup>25</sup> According to the Department of Housing and Urban Development, households who spend more than 30 percent of income on housing costs are considered cost-burdened. See [https://www.hud.gov/program\\_offices/comm\\_planning/affordablehousing/](https://www.hud.gov/program_offices/comm_planning/affordablehousing/)

<sup>26</sup> Author's tabulation of ACS, 2016, PUMS

*Map 5: Median Owner Cost to Income Among Mobile/Manufactured Home Owners*

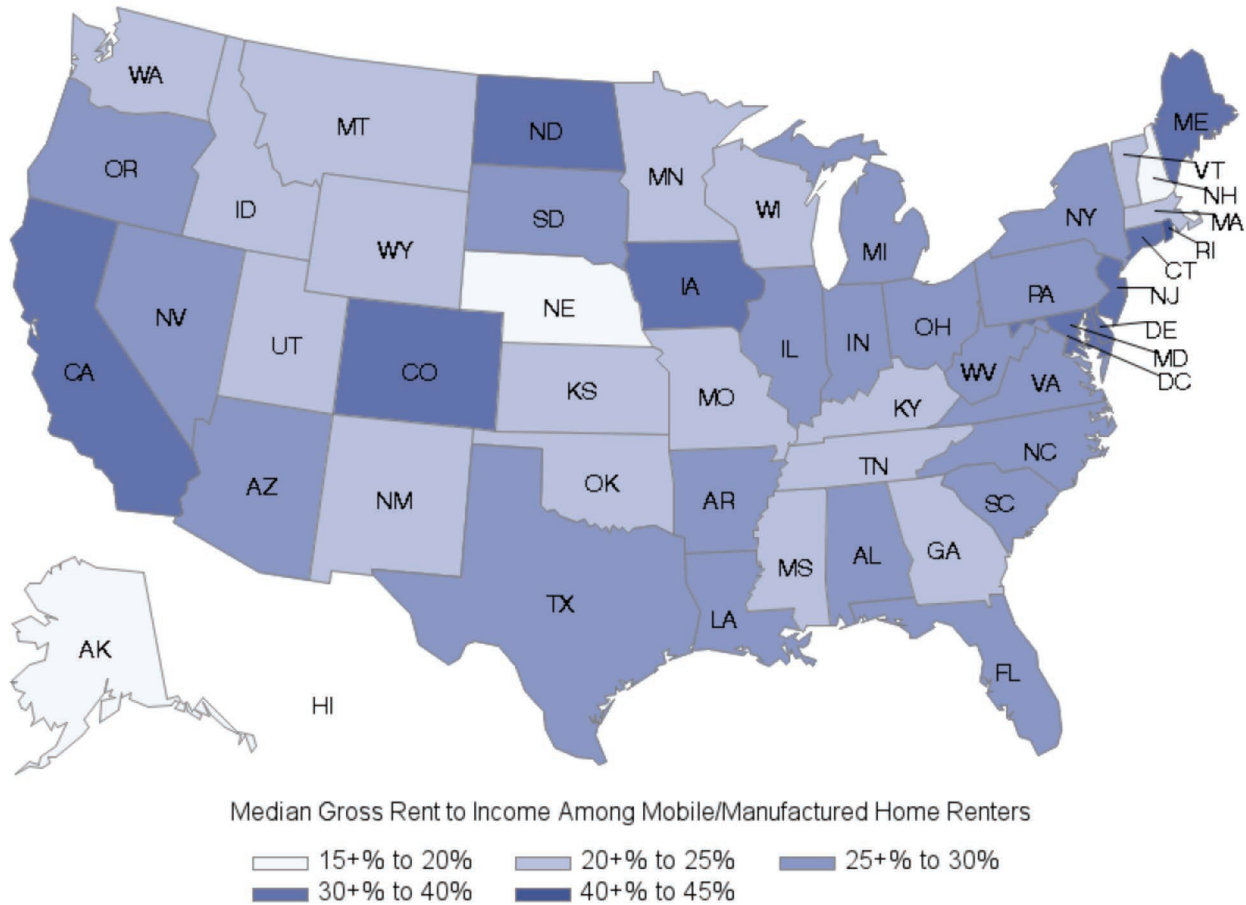


More renters were cost-burdened than homeowners, regardless of the type of housing unit. In 2016, 43 percent of renters of mobile/manufactured homes were cost-burdened, compared to 13 percent among households who owned the mobile/manufactured home. However, renters in mobile/manufactured homes were not as cost-burdened as renters

who lived in apartment units, of which 51 percent were cost-burdened. The most expensive states for mobile/manufactured home renters were California, Colorado, North Dakota, Iowa, Maryland, New Jersey, Connecticut, Rhode Island, and Maine where households spent more than 40 percent of income on gross rent (Map 6).



*Map 6: Median Gross Rent to Income Among Mobile/Manufactured Home Renters*

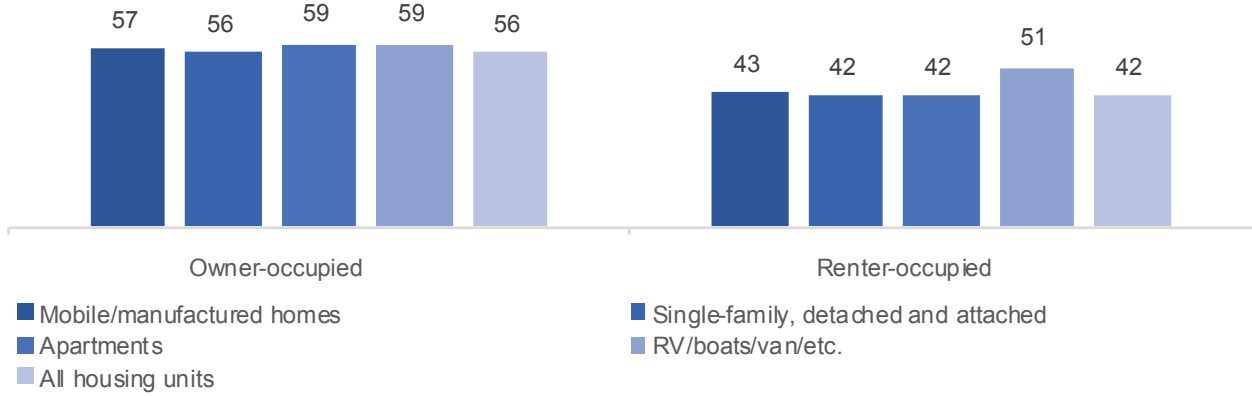


**Characteristics of Households**

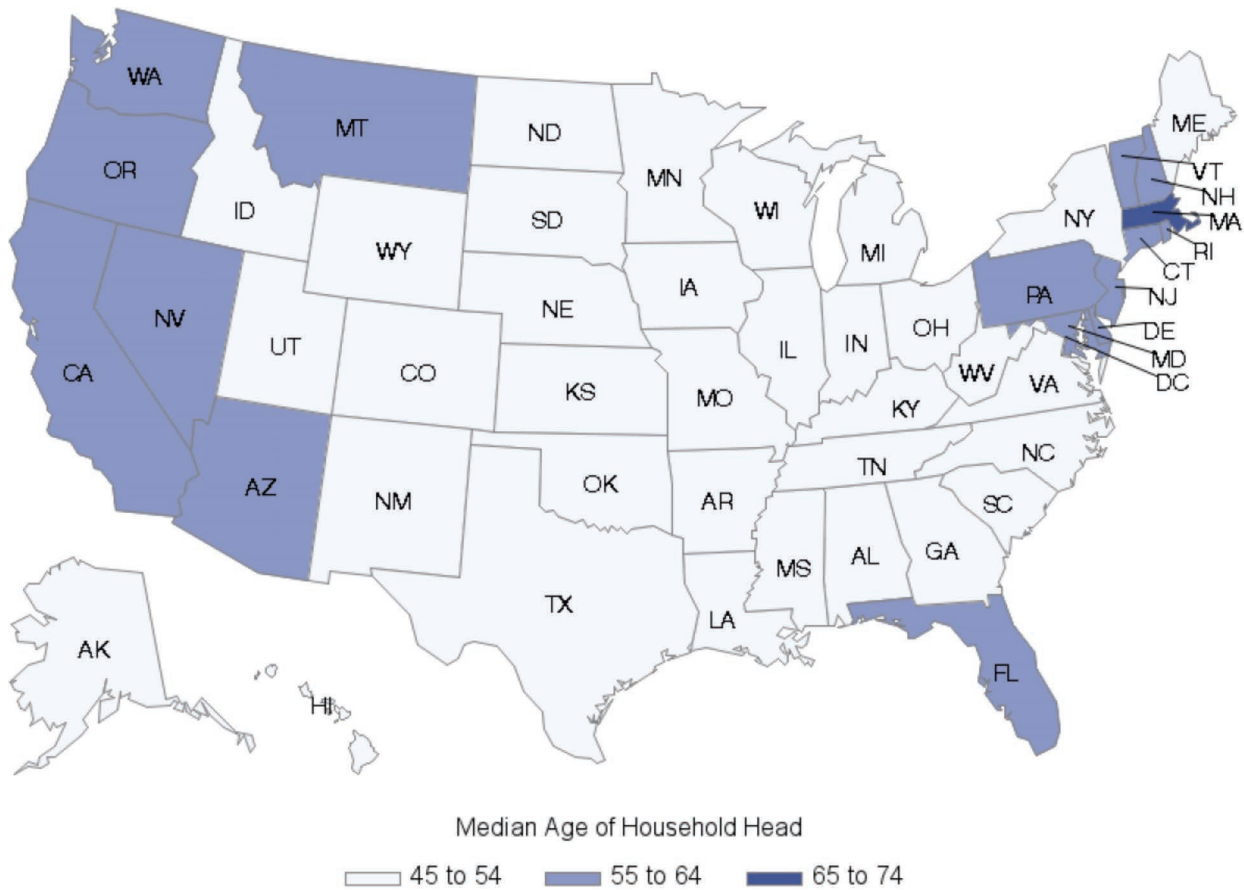
The head of households in mobile/manufactured homes tends to be slightly older than household heads in single-family units, at 57 years for owner-occupied mobile

homes and 43 years old for renters (Figure 12). In many states in the Northeast, West Coast, and Florida, the median age among households living in mobile/manufactured homes was 65 to 74 years old in 2016 (Map 7).

Figure 12: Median Age of Household in 2016, by Type of Household Unit and Tenure<sup>27</sup>



Map 7: Median Age of Household Head

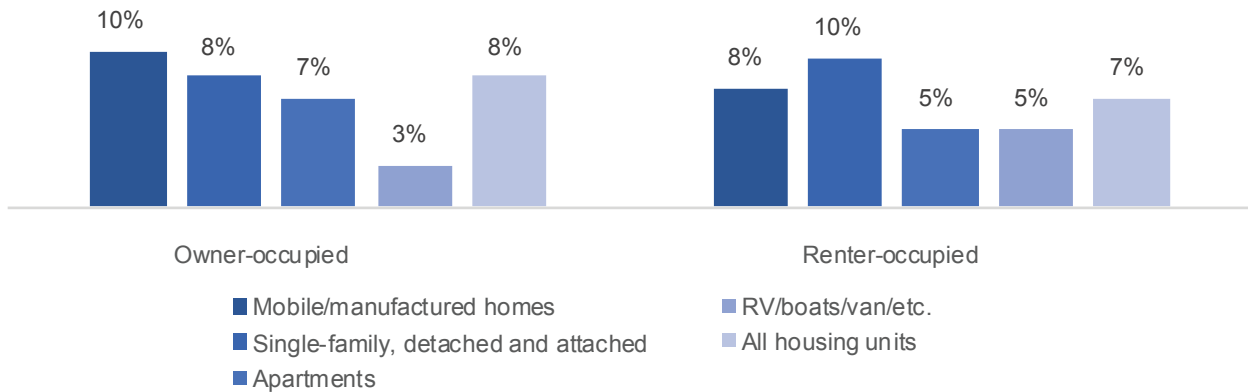


<sup>27</sup> Author's tabulation of ACS, 2016, PUMS

There is a higher fraction of multi-generational households among households living in mobile/manufactured homes, 10 percent among owners (eight percent nationally) and

eight percent among renters (seven percent nationally) (Figure 13).

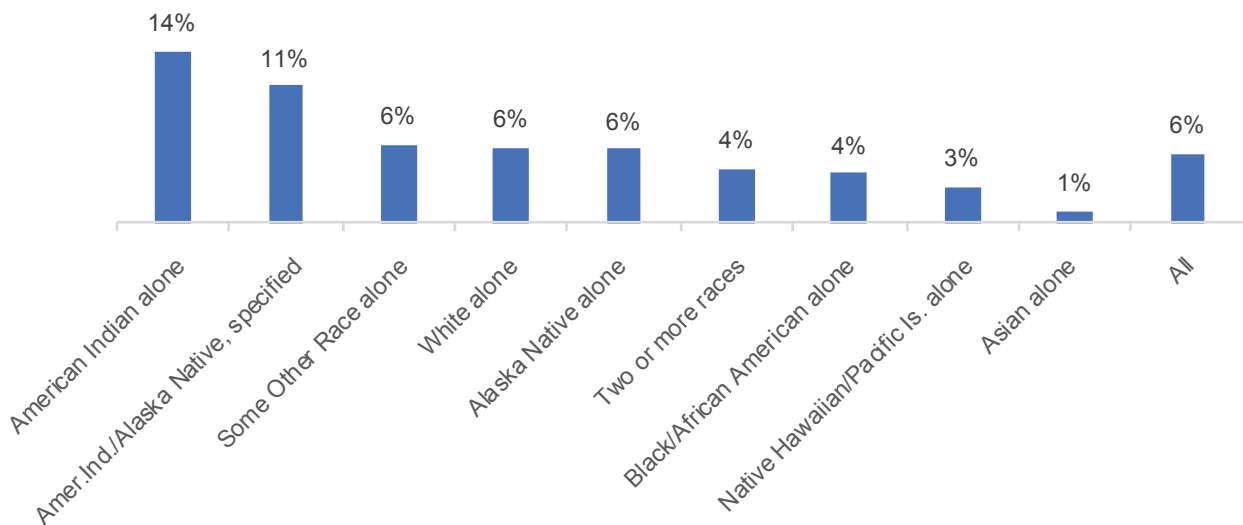
Figure 13: Percent of Households that are Multi-generational in 2016, by Type of Household Unit and Tenure<sup>28</sup>



Among the races, there is a higher percentage of American Indians (14 percent) and Alaskan Natives tribes who specified the tribe (11 percent) who lived in mobile/manufactured homes in 2016. Among the White alone racial group, six percent lived in mobile/manufactured homes, compared

to four percent among the Black alone racial group, and three percent of the Native Hawaiian and Pacific Islander racial group. Asians were the least likely to live in mobile/manufactured homes, at only one percent (Figure 14).

Figure 14: Percent of Population Who Lived in Mobile/Manufactured Homes in 2016<sup>29</sup>



28 Author's tabulation of ACS, 2016, PUMS

29 Author's tabulation of ACS, 2016, PUMS

### **Mobile/Manufactured Homes as Second Homes**

Mobile/manufactured homes are not only used as a primary residence, but also as second or vacation homes. In 2015, six percent were seasonally vacant compared to two percent among single-family detached homes. Among mobile/manufactured homes, 10.3 percent of units were extra or second homes compared to four percent among single-family detached homes. The extra unit was used for recreation. Seven percent were also rented out for more than one week.

### **Model-Based Estimate of the Likelihood of Living in a Mobile/Manufactured Home**

I estimated a logistic regression that estimates the likelihood that a household will live in a mobile home based on characteristics such as geographical location, race, presence of children, marital status, educational attainment, whether the household is a multigenerational household or not, and whether the household is headed by a person born in the United States (native-born) or not. I restricted the head of household to ages 25 years old and above (Figure 15).

Households in other geographical divisions are more likely than households in the New England division to live in a

mobile home. In the East South Central and South Atlantic divisions, households are about four times more likely than households in the New England division to live in a mobile home.

Relative to households headed by a Bachelor's degree holder, households headed by someone who does not have a diploma are six times more likely to live in a mobile home, while households who are headed by someone who has a graduate degree are less likely to live in a mobile home. Relative to the White alone population, only the American Indian alone and American Indian and Alaskan Native race groups are more likely than Whites to live in mobile homes, while all other race groups are less likely than Whites to live in mobile homes, especially Asians. Households who have children are only just slightly more likely than households who have no children to live in mobile homes, with the odds ratio at around 1. Multi-generational households are slightly more likely to live in a mobile home. Households with a head who is married, divorced, separated, or widowed are also slightly more likely to live in a mobile home than a household head who lives alone. Households headed by a person born in the United States (native-born) are about twice as likely to live in a mobile home than the foreign-born.

*Figure 15: Odds Ratio of Living in a Mobile Home Relative to Other Type of Housing<sup>30</sup>*

<b>Divisions Relative to New England (Northeast region)</b>	<b>Odds Ratio*</b>
East North Central (Midwest region)	1.3
East South Central (South region)	4.4
Middle Atlantic (Northeast region)	1.0
Mountain (West region)	3.1
Pacific (West region)	2.1
South Atlantic (South region)	4.1
West North Central (Midwest region)	1.6
West South Central (South Region)	3.3
<b>Race of Household Head Relative to White Alone</b>	
Alaska Native alone	0.7
American Indian alone	1.5
American Indian and Alaska Native	1.3
Asian alone	0.3
Black or African American alone	0.4
Native Hawaiian and Other Pacific Islander alone	0.4
Some Other Race alone	0.8
Two or More Races	0.7
<b>With Children Relative to No Children</b>	
With children 6 to 17 years only	1.1
With children under 6 years and 6 to 17 years	1.1
With children under 6 years only	1.0
<b>Marital Status Relative to Never Married or Under 15 Years Old</b>	
Divorced	1.3
Married	1.2
Separated	1.3
Widowed	1.2
<b>Age of Household Head Relative to 25 to 34 Year Old Household Head</b>	
35 to 44	1.1
45 to 54	1.1
55 to 64	1.0
65 and over	0.8
<b>Educational Attainment Relative to Household Head with Bachelors Degree</b>	
In School or no diploma	6.1
Regular HS or GED	4.3
Some college or associates degree	2.7
Masters, Profession, Graduate	0.8
<b>Mutigenerational Household (relative to non-multigenerational)</b>	<b>1.1</b>
<b>Native-born (relative to Foreign-born)</b>	<b>1.8</b>

30 Author's estimates based on U.S. Census Bureau 2016 American Community Survey 1-year PUMS

Model statistics:	
p-value of all coefficients of logistic model	<0.001
R2	0.995
Wald p-value	<.0001
Somer's D	0.549
Percent Concordant	77.4
Percent Discordant	22.60
Percent Tied	0.00

## HOUSING STOCK AND SUPPLY CHARACTERISTICS

### Manufactured Home Standards

The standards regulating the manufacture, transportation, and installation of manufactured homes have evolved to ensure that mobile/manufactured homes are built to be “as safe as possible.” As standards have changed, the mobile/manufactured homes of today are vastly different from the poorer quality mobile/manufactured homes of the past.

Before 1974, the regulation of mobile/manufactured housing was left to each state, with no federal regulations to ensure the same level of quality, safety, and durability of mobile/manufactured homes. Mass production and absence of standards resulted in poorly built structures with poor insulation, inefficient heating and cooling, and leaking roofs.<sup>31</sup> The “state-by-state patchwork of regulations” also complicated the shipping of houses across state lines.<sup>32</sup>

Recognizing the need to ensure the safety of mobile/manufactured homes, Congress passed in 1974 the National Manufactured Home Construction and Safety Standards Act (the Act). This Act delineated the features of a manufactured home and directed HUD to enforce the Act. On June 16, 1974, HUD implemented Title 24 Code of Federal Regulations Part 3280, Manufactured Home Construction and Safety Standards (the Standards). The Standards pertained to body and frame construction requirements,

thermal protection, plumbing, heating/cooling, fuel, electrical systems, and the transportation system. Under the Standards, all units shipped out of a manufacturing facility required a certification label, also called a “HUD label” or “red tag”, that certifies that the manufacturer built the home according to the Standards.<sup>33</sup>

In 1994, HUD amended the Manufactured Housing Construction and Safety Standards to improve the resistance of manufactured homes to wind forces in areas prone to hurricanes.<sup>34</sup> These standards have resulted in little damage to mobile/manufactured homes caused by hurricanes, such as Charley (2004), Katrina (2005), and Dennis (2005). Regarding the impact of Hurricane Charley, the study found that “Post July 13, 1994 homes performed significantly better than pre-1994 homes at a high level of confidence. Furthermore, pre-HUD homes were much more severely damaged than newer (post 1976) HUD Code units at a high confidence level.”<sup>35</sup> Regarding the impact of Hurricane Katrina, the Florida Department of Highway Safety and Motor Vehicles reported that “The assessment found that of the 3,291 mobile homes located in the mobile home parks visited, only 12 were destroyed or were not repairable. Half of these homes were damaged by wind and the other half were damaged by falling trees. Generally, the homes damaged by wind had their roofs

31 National Low-Income Housing Coalition. *40 Years Ago: Manufactured Construction and Safety Standards Act Passed*, <http://nlihc.org/article/40-years-ago-manufactured-housing-construction-and-safety-standards-act-passed>

32 Department of Housing and Urban Development, *Manufactured Housing Standards Program, 2014 Summary Statement and Initiatives*, <https://www.hud.gov/sites/documents/MNFCTRDHSGSTANDPROG.PDF>

33 Department of Housing and Urban Development, *HUD Labels (Tags)*, [https://www.hud.gov/program\\_offices/housing/rmra/mhs/mhslabels](https://www.hud.gov/program_offices/housing/rmra/mhs/mhslabels)

34 Government Publishing Office, Federal Register / Vol. 63, No. 91 / Tuesday, May 12, 1998 / Rules and Regulations, Department of Housing and Urban Development, *24 CFR Part 3280, Manufactured Home Construction and Safety Standards: Metal Roofing; Interpretative Bulletin I-2-98*, <https://www.gpo.gov/fdsys/pkg/FR-1998-05-12/pdf/98-12341.pdf>

35 Institute for Building Technology and Safety study for the Department of Housing and Urban Development, *An Assessment of Damage to Manufactured Homes Caused by Hurricane Charley*, March 31, 2005, <http://www.aresconsulting.biz/publications/HurricaneCharley04.pdf?PHPSESSID=vef6tbkc1h53eqmujpr61r3l56>

blown off. All the damaged homes were older homes built in the 1960s, 70s or 80s. None of the homes built after the 1994 revisions of HUD's mobile/manufactured home construction standards received any significant damage. There was substantial flooding of some mobile home parks with water up to 12 to 18 inches. The water did not, however, get into the homes. No homes moved from their foundations."<sup>36</sup> Regarding the impact of Hurricane Dennis, the Department reported that "The assessment found that of the 1,170 mobile homes located in the mobile home parks visited, 15 were destroyed or were not repairable. Of these 15 destroyed mobile homes, 8 were destroyed by falling trees rather than by wind or water forces. Only one destroyed home was built subsequent to the 1994 amendments to HUD's mobile home construction standards and it was destroyed by a falling tree rather than by wind or water forces."<sup>37</sup>

In 2000, Congress passed the Manufactured Housing Improvement Act (MHIA) of 2000 to strengthen the standards for the installation of manufactured homes and dispute resolution, which HUD implemented in 2001.<sup>38</sup>

In 2010, HUD strengthened its procedures for enforcing its regulations, which it codified in Title 24 Code of Federal Regulations Part 3282 – Manufactured Home Procedural and Enforcement Regulations<sup>39</sup>. The regulations required that mobile/manufactured home manufacturers must employ a Design Approval Primary Inspection Agency

(DAPIA), typically engineering firms, who certify that the manufacturer's mobile/manufactured home designs meet the Standards. The regulations also set up Production Inspection Primary Inspection Agencies (IPIA) who certify manufacturing plants before they can begin operations and who inspect manufacturing plants to ensure that the manufacturing process complies with the Manufactured Housing Construction and Safety Standards. State agencies or private companies can take the role of IPIA. The certification label ("red tag" or "HUD label") number bears the 3-letter designation which identifies the IPIA for the state in which the unit is manufactured.

Manufactured homes are regulated to meet wind, roof load, and thermal standards specific to zones delineated by HUD. For example, manufactured homes going to wind zone areas need to be built to withstand higher wind speeds, while manufactured homes going to areas that get heavy snowfall in the winter need to have roofs that can support a heavier amount of snow.<sup>40</sup>

### Age of the Mobile/Manufactured Housing Stock

Seventy-one percent of the stock of mobile/manufactured homes as of 2016 was built after 1979 and only 20 percent was built after 1999 (Figure 16). Unless these homes were restructured, they will likely not meet the Standards (1976, 1994) and will be harder to sell or rent out.

36 Florida Highway Safety and Motor Vehicles, *Mobile/Manufactured Home Damage Assessment from Hurricane Katrina*, 2005. [http://www.flhsmv.gov/html/reports\\_and\\_statistics/mhd\\_reports/Hurricane%20Katrina%20Report.pdf](http://www.flhsmv.gov/html/reports_and_statistics/mhd_reports/Hurricane%20Katrina%20Report.pdf)

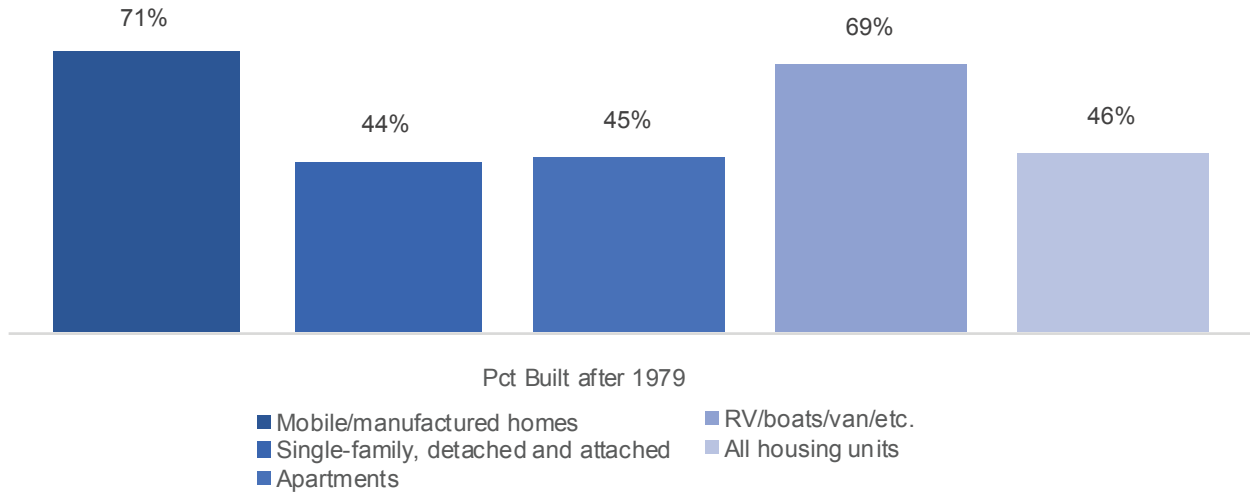
37 Florida Department of Highway Safety and Motor Vehicles, *Mobile/Manufactured Home Damage Assessment from Hurricane Dennis*, July 20, 2005, [https://www.flhsmv.gov/html/reports\\_and\\_statistics/mhd\\_reports/Hurricane%20Dennis%20Report.pdf](https://www.flhsmv.gov/html/reports_and_statistics/mhd_reports/Hurricane%20Dennis%20Report.pdf)

38 Department of Housing and Urban Development, Recent Program Activity, [https://www.hud.gov/program\\_offices/housing/rmra/mhs/faqs72010](https://www.hud.gov/program_offices/housing/rmra/mhs/faqs72010)

39 U.S. Government Publishing Office, *24 CFR 3282 – Manufactured Home Procedural and Enforcement Regulations*, <https://www.gpo.gov/fdsys/granule/CFR-2010-title24-vol5/CFR-2010-title24-vol5-part3282>

40 Department of Housing and Urban Development, *Model Manufactured Home Installation Standards*, <https://www.hud.gov/sites/documents/225HUD.PDF>

Figure 16: Percent of Housing Stock Built After 1979 as of 2016<sup>41</sup>



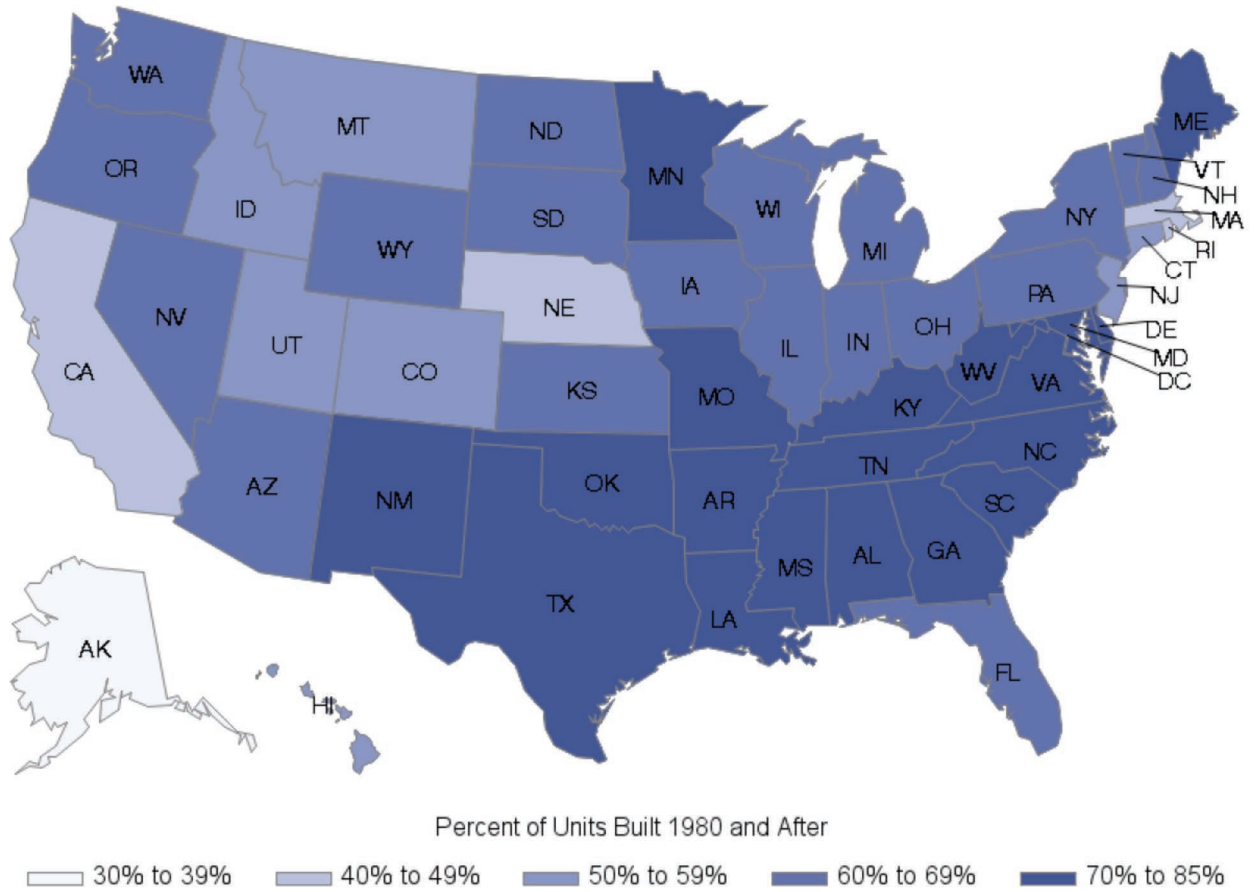
The share of mobile/manufactured housing built after 1976 varies by state. At least 70 percent of the mobile/manufactured housing stock in the South was built in 1980 and after (Map 8). In Louisiana and North Dakota, 30 to 40 percent of the mobile housing stock was built from 2000

onwards (Map 9). Louisiana's new stock was built in the wake of Hurricane Katrina, while North Dakota's new stock was likely built to meet the housing needs of workers employed by the booming shale oil industry.

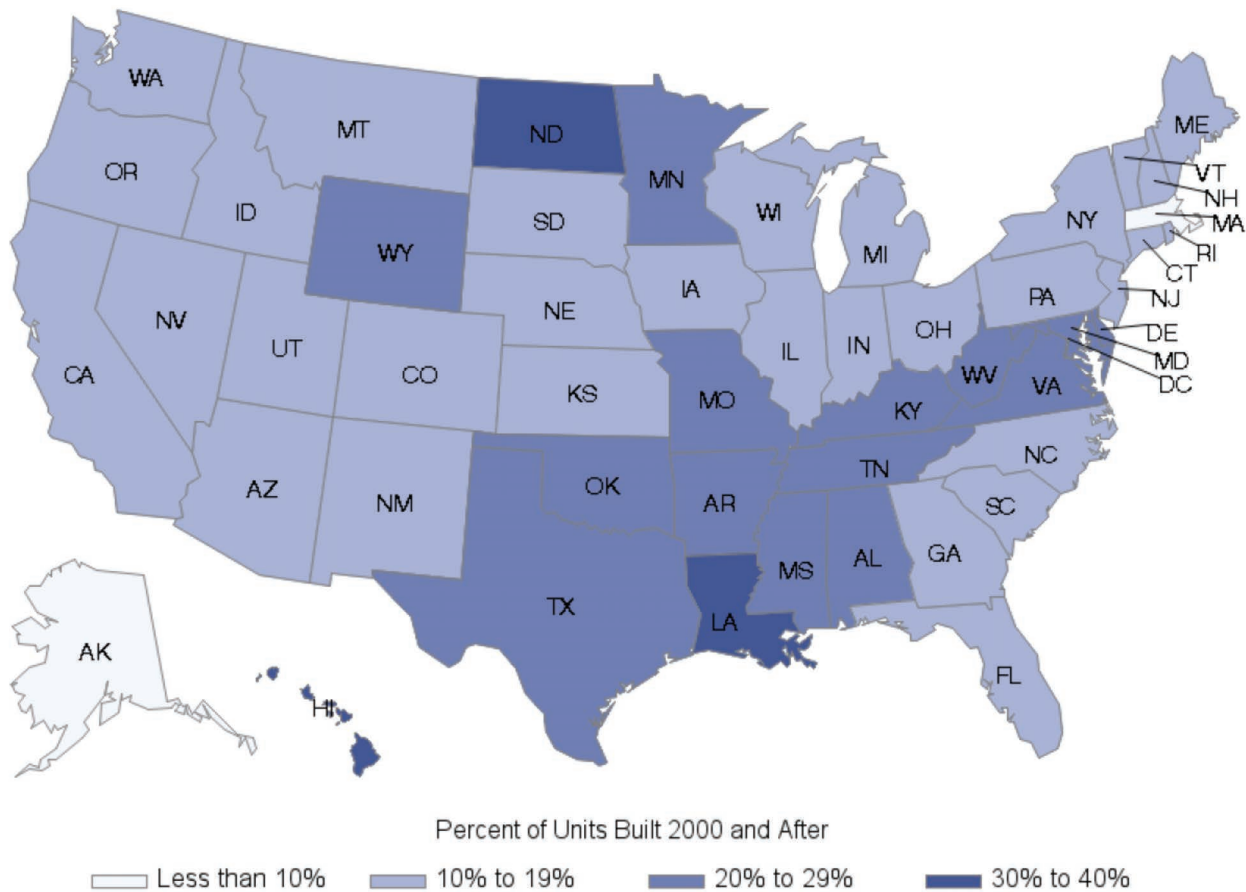
<sup>41</sup> Author's tabulation of ACS, 2016, PUMS



Map 8: Percent of Units Built 1980 and After



*Map 9: Percent of Units Built 2000 and After*



**Quality of the Housing Stock and Neighborhood**

Perhaps contrary to the stigmatized perception about mobile/manufactured homes, the majority of homes are suitable for year-round use, and most households have access to schools, a good commuter system, and live in safe neighborhoods. Still, compared to single-family detached homes, households who live in mobile/manufactured homes are relatively less connected to schools and commercial areas, have less access to a good transportation system, and face more crime. Based on the 2015 American Housing Survey, 91 percent of mobile/manufactured homes had adequate

plumbing, heating, electrical wiring and upkeep compared to 95 percent for single-family detached homes. Among respondents who lived in mobile/manufactured homes, 76 percent reported access to good schools, compared to 82 percent of respondents who lived in single-family detached homes. Nearly 20 percent reported their neighborhood has “a lot of petty crime” compared to 13 percent among single-family detached residents. Only 20 percent reported they have a good bus/subway/commuter system compared to 34 percent among single-family home residents (Figure 17).

Figure 17: Housing Characteristics

	1-unit, detached	Manufactured/ mobile home
Housing units	83,059	8,715
Median square footage of unit	1,800	1,100
<b>Bedrooms</b>		
None	0.2%	0.3%
1	2.1%	6.1%
2	15.5%	38.4%
3	50.3%	47.8%
4 or more	32.0%	7.4%
<b>Bathrooms</b>		
At least 1 complete bathroom	99.9%	99.9%
1	22.8%	32.0%
1.5	12.7%	10.0%
2	32.1%	54.0%
More than 2	32.4%	4.0%
Built and heated for year-round use	99%	98%
With primary air-conditioning	88%	85%
With hot piped water	99%	97%
With garage or carport	78.8%	31.7%
With washing machine	91.7%	79.1%
Percent with institutional/commercial structures within 1/2 block	18.0%	14.3%
Percent with trash, litter, or junk on streets	91.8%	86.7%
Percent who reported "Agreed, has good schools"	81.8%	75.9%
Percent who reported "Has a lot of petty crime"	13.3%	18.5%
Percent who reported "Has a lot of serious crime"	4.5%	6.6%
Percent who reported "Has a good bus, subway, commuter"	33.7%	20.4%
Percent who reported at risk of floods	7.1%	10.8%

## Type of Manufactured Homes

In the 50's, units were only 10-feet-wide, but over time, sizes increased as States allowed the transport of wider-sized units. In 2016, single-section homes averaged 1,075 square feet, and double-section homes averaged 1,746 square feet. The stock of mobile/manufactured homes is mainly single-section (or single-wide), at 60 percent, based on the 2015 American Housing Survey. Multi-section homes (two or more sections) are larger, wider, and shorter to give them the look of traditional site-built homes.

Demand for multi-section (two or more sections) homes increased during 1995 through 2003, in line with the general uptrend in homebuying prior to the housing downturn, but the share has declined since 2003, perhaps because of tighter lending standards in the wake of the housing crisis and the relative unaffordability of multi-section homes compared to single-section homes (Figure 18).

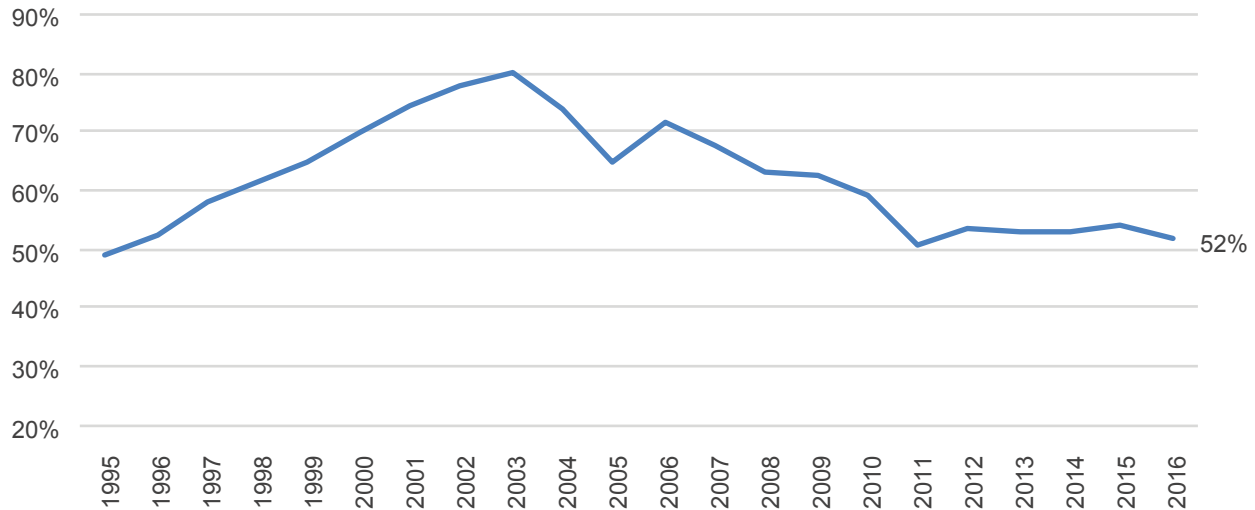
Today's manufactured homes have designs and amenities that give them the look and feel of traditional site-built homes, from Cape Cod to Victorian styled-homes.<sup>42</sup> The Manufactured Housing Institute notes that floor plans range from basic to elaborate, with "vaulted or tray ceilings, fully equipped kitchens, walk-in closets and luxurious bathrooms". Exterior siding can be "metallic, vinyl, wood or hardboard and stucco." New roof designs are available, such as "pitched roofs with shingles and gabled ends." Upgrades include "awnings, patio covers, decks, site-built garages and permanent foundations."<sup>43</sup>

42 Realty Times, "Mobile homes: Single Wide or Double Wide", April 28, 2017,

<https://realtymtimes.com/advicefromagents/item/1001800-mobile-homes-single-wide-or-double-wide>

43 Manufactured Housing Institute, *Manufactured Housing in the United States*, <http://www.manufacturedhousing.org/wp-content/uploads/2017/10/2017-MHI-Quick-Facts.pdf>

Figure 18: Multi-section Manufactured Home Shipments<sup>44</sup>



## FINANCING: MORTGAGE VERSUS CHATTEL FINANCING

The type of financing that can be obtained for manufactured housing depends on how the manufactured home is titled, and titling depends on whether the owner of the mobile/manufactured unit also owns the land on which the property is set on a permanent foundation that renders the unit immobile (affixed to the land).

For manufactured homes that are not affixed to the land, the property is considered personal property or a chattel—like other movable personal properties such as vehicles—so only chattel financing is available. If the property is affixed to the land, mortgage financing can be obtained for the purchase of a manufactured home, the lot, or both. The FHA Title I program provides financing for the purchase of the unit, the lot, or both, while Fannie Mae and Freddie Mac only provides financing for a manufactured home that is affixed to the land (Figure 19).

Chattel loans (loans secured by personal property) carry higher rates of interest than mortgage loans (loans secured by real estate). According to a 2014 study of the Consumer Financial Protection Bureau, most loans for manufactured housing are more likely to be classified as higher priced mortgage loans, a loan with an interest rate 150 basis points or more above the average primer offer rate (“APOR”) for all first-lien loans and 350 basis points or more above the APOR for junior liens. The median rate spread over the average prime offer rate (APOR) for all purchase loans for manufactured homes in 2012 was 375 basis points.<sup>45</sup> The 2014 CFPB study also reported that the annual percentage rates (APR) on chattel loans are about 150 basis points higher than for mortgages on manufactured homes.<sup>46</sup>

<sup>44</sup> U.S. Census Bureau

<sup>45</sup> CFPB, supra note 8, p.32.

<sup>46</sup> CFPB, supra note 8, p.36.

Figure 19: Manufactured Home Financing Guidelines<sup>47</sup>

	FHA Title I	Fannie Mae / 1	Freddie Mac
<b>Property Type</b>	Either Manufactured home only, land only, manufactured home and land	Manufactured home titled as real property and affixed to the land	Manufactured home affixed to the land, minimum of 600 sq ft, titled as real property
<b>Location</b>	Can be on rental site in a manufactured home park	No area requirements, except home is affixed to the land	Area is zoned for residential use ; if single-wide, only in PUD or condo area; if multi-wide, can be in individual lot or subdivision
<b>Loan Purpose</b>	Home purchase , refinancing	Home purchase, refinancing with cash-out refinancing allowed for owner-occupied primary residence only, with 65 LTV	Home purchase , refinancing with cash-out refinancing for 20-year term with less than or equal to 65 LTV
<b>Use of unit</b>	Primary residence only	Primary residence , secondary home	Primary residence, second home
<b>Loan term</b>	Manufactured home: 20 years	Up to 30 years	20 years: Greater than 90 LTV to 95 LTV
	Manufactured home lot loan: 15 years		30 years: Less than 90 LTV
	Multi-section home and lot: 25 years		
<b>Down-payment</b>	Meet minimum D/P of 3.5 percent	Must meet Desktop Underwriter® eligibility standards	Minimum 5% D/P must come from borrower's funds
			20 years: Greater than 90 LTV to 95 LTV
<b>Max LTV</b>	None	Primary residence: max of 95 LTV;	30 years: Less than 90 LTV
<b>FICO score standards</b>	None	Must meet Desktop Underwriter® eligibility standards	Submitted to Loan Product Advisor® automated underwriting but can be manually underwritten if Invalid/Ineligible/Incomplete/"caution" risk class/ not A-
<b>DTI</b>	None, but borrower needs to "demonstrate they have adequate income"	Must meet Desktop Underwriter® eligibility standards	Submitted to Loan Product Advisor® automated underwriting, but can be manually underwritten if Invalid/Ineligible/Incomplete/"Caution" risk class/ not A-
<b>Max Loan Value</b>	Manufactured home only - \$69,678	Must meet Desktop Underwriter® eligibility standards	Submitted to Loan Product Advisor® automated underwriting but can be manually underwritten if Invalid/Ineligible/Incomplete/"caution" risk class/ not A-
	Manufactured home lot - \$23,226		
	Manufactured home & lot - \$92,904		

47 /1 Fannie Mae B5-2-01 Selling Guide; [https://www.fanniemae.com/content/eligibility\\_information/manufactured-housing-guidelines.pdf](https://www.fanniemae.com/content/eligibility_information/manufactured-housing-guidelines.pdf)  
 /2 Freddie Mac SF 5703 Selling Guide; <http://www.freddie.com/singlefamily/expmks/mhle.html>  
[http://www.freddie.com/learn/pdfs/uw/manuf\\_home.pdf](http://www.freddie.com/learn/pdfs/uw/manuf_home.pdf)

I compared the total monthly housing costs between chattel and mortgage financing to evaluate affordability and the net income gain: 1) chattel financing for a manufactured home on leased land; 2) mortgage financing for a manufactured home sited on owned land; 3) mortgage financing for a manufactured home and land sold as a package; and 4) mortgage financing for an existing single-family home and land sold as a package; and 5) mortgage financing for a new single-family site-built home and land sold as a package (Figure 20). Housing costs include the mortgage payment (principal and interest), mortgage insurance, real estate taxes, and land rent (for mobile/manufactured homes on rented land).

The calculations show that households obtaining chattel financing for manufactured homes on leased land are likely to spend more on housing costs (\$1,341) compared to households obtaining mortgage financing for manufactured homes on owned land (\$1,079). However, households obtaining chattel financing are likely to spend less on housing costs compared to households obtaining mortgage financing for the both the housing unit and the lot (\$1,795) because of the higher loan balance for the latter. Monthly housing costs are higher for households obtaining mortgage financing for the purchase of an existing single-family home and land sold as one package (\$2,100) or for the purchase of a new single-family site-built home and land sold as one package (\$2,869) because of the higher loan balances.

However, households who do not own the land will also tend to experience a loss in the value of the property, because most of the property appreciation accrues from the land. Taking account of both the housing cost savings and

the change in property values, households who lease the land will be \$33,691 less wealthy than households who also owned the land by the 20th year.

According to the 2014 CFPB study, 65 percent of borrowers who own their land and who took out a loan to buy a manufactured home between 2001 and 2010 obtained a chattel loan. If mortgage financing is less costly than chattel financing, why do most households who own land obtain chattel financing? One reason pertains to state regulation: as noted earlier, only 22 states allow mobile/manufactured homes to be titled as real property. Because the government sponsored enterprises (GSEs) —Fannie Mae and Freddie Mac —extend loans only for properties titled as real estate, manufactured homes titled as chattel will not qualify for GSE financing. Another reason cited in the CFPB study is that chattel loans often have lower origination costs and may close more quickly than mortgages (loans secured by real property), features that may outweigh the higher cost of chattel financing.<sup>48</sup> Another reason may be that the underwriting guidelines of Fannie Mae and Freddie Mac (e.g., FICO score, debt-to-income ratios, and loan-to-value ratios) may be hard to meet for households most likely to reside in mobile/manufactured homes. The Federal Housing Authority (FHA) Title I program does not have these underwriting criteria, only that the borrower demonstrates they have “adequate income.” However, the program caps the loan amount at \$92,204<sup>49</sup>, an amount that will not suffice for households seeking double-section homes (recall that households living in mobile/manufactured homes are more likely to be multigenerational and have more members per household). Another reason is that manufactured home owners may not want to encumber owned land.

<sup>48</sup> CFPB, *supra* note 8, p.6.

<sup>49</sup> Title I limit to purchase or refinance a manufactured home unit only is \$69,678. The loan limit to purchase or develop a lot on which to place a manufactured home is \$23,226. The total amount to purchase or refinance a manufactured home and lot on which to place the home is \$92,904. See HUD.gov Title I Loans for Property Improvements and Manufactured Housing at [https://www.hud.gov/program\\_offices/housing/sfh/title](https://www.hud.gov/program_offices/housing/sfh/title).

Figure 20: Monthly Payment and Equity Gain for Manufactured Homes Compared to Existing and New Single-family Site-built Homes<sup>50</sup>

	Chattel financing for a manufactured home on rented land	Mortgage financing for a manufactured home on affixed land	Mortgage financing for both manufactured home and land	Mortgage financing for an existing single-family home and land sold as a package	Mortgage financing for a site-built single-family home and land sold as a package
House price	\$95,500	\$95,500	\$95,500	\$197,780	\$303,380
Lot price	-	\$90,620	\$90,620	\$90,620	\$90,620
House and lot	\$95,500	\$186,120	\$186,120	\$288,400	\$394,000
Downpayment (3.5%)	\$3,343	\$3,343	\$6,514	\$10,094	\$13,790
Loan	\$92,158	\$92,158	\$179,606	\$278,306	\$380,210
Upfront mortgage insurance	-	\$1,671	\$3,257	\$5,047	\$6,895
Rate	9.75%	8.3%	8.3%	4.5%	4.5%
Term (years)	20	30	30	30	30
Monthly debt payment	\$874	\$692	\$1,349	\$1,410	\$1,926
Monthly land rent	\$300	-	-		
Mortgage insurance (PMI), Year 1	-	\$61	\$120	\$186	\$253
Monthly real estate or personal property tax, Year 1	\$88	\$171	\$171	\$264	\$361
Monthly home maintenance costs	\$80	\$155	\$155	\$240	\$328
Annual land value appreciation	0%	4%	4%	4%	4%
Annual property depreciation	2%	2%	2%	1%	1%
Monthly housing payment	\$1,341	\$1,079	\$1,795	\$2,100	\$2,869
Change in property value after 20 years	-\$28,056	\$114,478	\$114,478	\$217,647	\$297,340
Net wealth gain after 20 years compared to land lease option		\$79,712	\$33,691	\$63,515	-\$41,368

50 /1 U.S. Census Bureau. Average price of double-section manufactured homes as of October 2017

/2 Land is 23 percent share of the total cost of site-built single-family home and land, based on 2016 U.S. Census data.

/3 U.S. Census Bureau. Price of single-family homes built for sale as of October 2017

/4 For FHA loans, upfront mortgage is 1.75 percent of the base loan amount.

/5 Median rate spread over APOR for all purchase loans for manufactured homes in 2012 was 375 basis points, based on 2014 CFPB study (p.32).

APR on chattel loans are about 150 basis points higher on average than for mortgages on manufactured homes, based on 2014 CFPB study (p.36)

If households who have higher incomes and better credit profiles obtain a loan for a manufactured home, the interest rate will likely be lower.

/6 Source, CFPB. Manufactured loans are chattel loans and have a lower term, usually 20 years.

/7 Source: EZHomes, December 15, 2017, <https://www.mhomebuyers.com/mobile-home-lot-rent/>

/8 for FHA loans the annual mortgage insurance premium (PMI) is 80 bp for 30-year term loans of less than or equal to \$625,000 and with LTV 90 percent or higher

/9 Average U.S. real estate taxes of 1.1 percent, based on 2016 U.S. Census Bureau American Community Survey. For tax purposes, states tax the mobile/manufactured unit as either real estate or personal property. Some states allow the property to be converted from personal property to real property (e.g., California, Nevada, Texas).

/10 Based on 2015 AHS data, the median routine maintenance expenditure was 0.7%, rounded off to 1%.

/11 Compounded annual growth rate of land prices from 2000Q1-2016Q1 based on Lincoln Land Institute price index for residential land.

/12 About 10 percent of mobile/manufactured housing units were built in 1960, so I used a lifespan of 56 years. Meeks (2003) estimated a lifespan of 58 years for units that existed in 2001. In the case of single-family detached homes, 13 percent was built in 1939, so I used a lifespan of 77 years.

/13 Housing costs are payments for principal, interest, mortgage insurance, real estate taxes, and land rent.

## CONCLUSION

Compared with households in single-family detached homes, households who live in mobile/manufactured housing are more likely to have lower income, less formal education, older heads, more household members, and be multi-generational. Mobile/manufactured housing constitutes a higher share of the stock of housing in the South and Midwest, with a higher fraction of Native American and White occupants. Mobile/manufactured homes are also frequently used as second/vacation homes.

Manufactured housing is an affordable housing option, especially among lower income groups. Households who obtain chattel financing for mobile/manufactured homes and who rent the land will tend to spend less on housing expenses (mortgage, interest, mortgage insurance, taxes, land rent) compared to households who obtain mortgage financing for the mobile/manufactured home and the land, even if chattel financing (interest) costs are higher (because the loan value is higher in the latter). However, if the household already owns the land, then mortgage financing for the manufactured home only is less costly than obtaining chattel financing. However, taking account of both the appreciation in the value of the land and the cost savings,

households who lease the land will likely accumulate less wealth compared with households who own the land.

Chattel financing (for personal property) is typically costlier than mortgage financing (for real estate). However, even if 66 percent of manufactured homes were shipped to private property lands, only 17 percent were titled as personal property. One reason is that titling is regulated by state regulations: as of 2016, only 22 states allow mobile/manufactured homes to be titled as real property. It follows that if more states allow manufactured homes to be titled as real property, more households will be able to obtain mortgage financing, which is typically less costly than chattel financing (150 basis points less).

Compared with the unregulated mobile/trailer homes of the past, the manufactured homes built after 1976 have a higher level of safety, durability, and quality, and the small fraction of homes damaged during hurricanes attests to their safety and durability. New design features and multi-section homes are increasingly giving them the look of traditional site-built homes. These safety standards and improved features should lead to the increasing acceptance of manufactured homes as a safe, durable, and affordable type of housing.



**APPENDIX**
*Appendix Table 1: Stock of Mobile/Manufactured Homes<sup>51</sup>*

	Total housing units	Total vacant housing units	Total occupied housing units	Total housing units – Mobile home	Total occupied mobile homes	Vacant mobile homes	Mobile housing units, as percent of total housing units	Percent distribution of mobile in the U.S.
<b>United States</b>	<b>135,702,775</b>	<b>16,842,710</b>	<b>118,860,065</b>	<b>8,436,002</b>	<b>6,605,663</b>	<b>1,830,339</b>	<b>6.2%</b>	<b>100.0%</b>
<b>South region:</b>	<b>52,153,320</b>	<b>7,377,345</b>	<b>44,775,975</b>	<b>4,937,410</b>	<b>3,827,695</b>	<b>1,109,715</b>	<b>9.5%</b>	<b>58.5%</b>
South Carolina	2,236,262	358,375	1,877,887	369,050	299,198	69,852	16.5%	4.4%
West Virginia	886,710	164,585	722,125	136,141	103,786	32,355	15.4%	1.6%
Mississippi	1,307,492	216,247	1,091,245	197,405	153,851	43,554	15.1%	2.3%
Alabama	2,230,180	377,662	1,852,518	296,549	228,627	67,922	13.3%	3.5%
Louisiana	2,037,067	316,266	1,720,801	263,349	205,329	58,020	12.9%	3.1%
North Carolina	4,540,697	658,274	3,882,423	584,847	474,137	110,710	12.9%	6.9%
Kentucky	1,965,577	247,871	1,717,706	239,571	186,632	52,939	12.2%	2.8%
Arkansas	1,354,801	212,083	1,142,718	159,358	117,570	41,788	11.8%	1.9%
Oklahoma	1,721,072	251,730	1,469,342	163,108	120,119	42,989	9.5%	1.9%
Georgia	4,219,103	532,968	3,686,135	393,457	312,837	80,620	9.3%	4.7%
Tennessee	2,919,698	363,366	2,556,332	268,399	214,784	53,615	9.2%	3.2%
Florida	9,302,140	1,728,684	7,573,456	829,927	601,048	228,879	8.9%	9.8%
Delaware	426,154	75,069	351,085	33,947	22,918	11,029	8.0%	0.4%
Texas	10,754,268	1,218,656	9,535,612	785,584	616,507	169,077	7.3%	9.3%
Virginia	3,491,185	370,493	3,120,692	182,937	145,077	37,860	5.2%	2.2%
Maryland	2,447,211	252,554	2,194,657	33,674	25,168	8,506	1.4%	0.4%
District of Columbia	313,703	32,462	281,241	107	107	–	0.0%	0.0%
<b>West region:</b>	<b>28,783,185</b>	<b>2,863,924</b>	<b>25,919,261</b>	<b>1,646,080</b>	<b>1,344,972</b>	<b>301,108</b>	<b>5.7%</b>	<b>19.5%</b>
New Mexico	917,641	159,277	758,364	151,525	116,747	34,778	16.5%	1.8%
Wyoming	270,625	47,006	223,619	36,239	26,946	9,293	13.4%	0.4%
Arizona	2,961,136	442,084	2,519,052	317,464	223,338	94,126	10.7%	3.8%
Montana	497,749	81,624	416,125	52,341	43,530	8,811	10.5%	0.6%
Oregon	1,732,887	161,209	1,571,678	140,867	126,354	14,513	8.1%	1.7%
Idaho	700,829	89,957	610,872	54,347	44,381	9,966	7.8%	0.6%
Washington	3,025,802	257,726	2,768,076	188,530	165,807	22,723	6.2%	2.2%
Nevada	1,221,759	166,601	1,055,158	64,724	51,142	13,582	5.3%	0.8%
Colorado	2,339,140	230,148	2,108,992	93,474	81,738	11,736	4.0%	1.1%
California	14,061,375	1,117,197	12,944,178	513,455	440,202	73,253	3.7%	6.1%
Utah	1,054,242	111,095	943,147	33,114	24,787	8,327	3.1%	0.4%

51 U.S. Census Bureau, American Community Survey, 2016, 1-year estimates. Table B25032

	Total hous- ing units	Total vacant housing units	Total occu- pied hous- ing units	Total housing units - Mobile home	Total occupied mobile homes	Vacant mobile homes	Mobile housing units, as percent of total housing units	Percent dis- tribu- tion of mobile in the U.S.
<b>Midwest region:</b>	<b>29,964,214</b>	<b>3,497,125</b>	<b>26,467,089</b>	<b>1,239,312</b>	<b>954,447</b>	<b>284,865</b>	<b>4.1%</b>	<b>14.7%</b>
South Dakota	383,827	49,824	334,003	32,890	25,760	7,130	8.6%	0.4%
North Dakota	368,545	53,411	315,134	24,809	17,066	7,743	6.7%	0.3%
Missouri	2,760,226	388,036	2,372,190	175,558	131,398	44,160	6.4%	2.1%
Michigan	4,560,164	676,011	3,884,153	240,460	185,580	54,880	5.3%	2.9%
Indiana	2,854,595	321,325	2,533,270	135,237	108,156	27,081	4.7%	1.6%
Kansas	1,259,870	149,463	1,110,407	53,482	41,158	12,324	4.2%	0.6%
Iowa	1,380,087	132,155	1,247,932	50,996	40,926	10,070	3.7%	0.6%
Ohio	5,164,400	539,731	4,624,669	190,643	153,198	37,445	3.7%	2.3%
Wisconsin	2,668,443	341,445	2,326,998	95,745	64,953	30,792	3.6%	1.1%
Nebraska	827,191	79,629	747,562	27,691	18,616	9,075	3.3%	0.3%
Minnesota	2,409,701	260,976	2,148,725	79,572	57,088	22,484	3.3%	0.9%
Illinois	5,327,165	505,119	4,822,046	132,229	110,548	21,681	2.5%	1.6%
<b>Northeast region:</b>	<b>23,954,214</b>	<b>2,960,810</b>	<b>20,993,404</b>	<b>596,421</b>	<b>465,571</b>	<b>130,850</b>	<b>2.5%</b>	<b>7.1%</b>
Maine	730,786	199,126	531,660	59,442	46,570	12,872	8.1%	0.7%
Vermont	329,539	74,688	254,851	20,594	17,065	3,529	6.2%	0.2%
New Hampshire	625,337	104,694	520,643	34,897	26,788	8,109	5.6%	0.4%
Pennsylvania	5,611,995	674,224	4,937,771	220,403	173,901	46,502	3.9%	2.6%
New York	8,232,039	1,022,985	7,209,054	188,494	143,762	44,732	2.3%	2.2%
Rhode Island	462,598	54,359	408,239	4,481	3,503	978	1.0%	0.1%
New Jersey	3,604,688	410,169	3,194,519	32,969	25,467	7,502	0.9%	0.4%
Connecticut	1,499,145	141,876	1,357,269	12,430	10,139	2,291	0.8%	0.1%
Massachusetts	2,858,087	278,689	2,579,398	22,711	18,376	4,335	0.8%	0.3%
<b>Pacific region:</b>	<b>847,842</b>	<b>143,506</b>	<b>704,336</b>	<b>16,779</b>	<b>12,978</b>	<b>3,801</b>	<b>2.0%</b>	<b>0.2%</b>
Alaska	310,672	62,204	248,468	15,856	12,225	3,631	5.1%	0.2%
Hawaii	537,170	81,302	455,868	923	753	170	0.2%	0.0%

*Appendix Table 2: Tenure in Mobile/Manufactured Homes in 2016<sup>52</sup>*

Geography	Total occupied housing units	Owner-occupied housing units	Renter-occupied housing units	Total occupied mobile homes	Owner-occupied mobile homes	Renter-occupied mobile homes	Percent of all housing units that are owner-occupied	Percent of mobile homes that are owner-occupied
<b>United States</b>	<b>118,860,065</b>	<b>75,022,569</b>	<b>43,837,496</b>	<b>6,605,663</b>	<b>4,693,277</b>	<b>1,912,386</b>	<b>63.1%</b>	<b>71.0%</b>
<b>South Region:</b>	<b>44,775,975</b>	<b>28,706,853</b>	<b>16,069,122</b>	<b>3,827,695</b>	<b>2,620,405</b>	<b>1,207,290</b>	<b>64.1%</b>	<b>68.5%</b>
South Carolina	1,877,887	1,288,871	589,016	299,198	198,855	100,343	68.6%	66.5%
West Virginia	722,125	523,078	199,047	103,786	72,819	30,967	72.4%	70.2%
Mississippi	1,091,245	734,114	357,131	153,851	111,394	42,457	67.3%	72.4%
Alabama	1,852,518	1,268,138	584,380	228,627	164,154	64,473	68.5%	71.8%
North Carolina	3,882,423	2,493,388	1,389,035	474,137	295,915	178,222	64.2%	62.4%
Louisiana	1,720,801	1,105,710	615,091	205,329	146,164	59,165	64.3%	71.2%
Kentucky	1,717,706	1,148,175	569,531	186,632	130,420	56,212	66.8%	69.9%
Arkansas	1,142,718	737,632	405,086	117,570	84,053	33,517	64.6%	71.5%
Georgia	3,686,135	2,268,606	1,417,529	312,837	192,831	120,006	61.5%	61.6%
Tennessee	2,556,332	1,664,018	892,314	214,784	138,197	76,587	65.1%	64.3%
Oklahoma	1,469,342	953,552	515,790	120,119	87,786	32,333	64.9%	73.1%
Florida	7,573,456	4,857,125	2,716,331	601,048	433,920	167,128	64.1%	72.2%
Delaware	351,085	245,005	106,080	22,918	16,648	6,270	69.8%	72.6%
Texas	9,535,612	5,825,471	3,710,141	616,507	432,297	184,210	61.1%	70.1%
Virginia	3,120,692	2,037,641	1,083,051	145,077	95,077	50,000	65.3%	65.5%
Maryland	2,194,657	1,445,953	748,704	25,168	19,786	5,382	65.9%	78.6%
District of Columbia	281,241	110,376	170,865	107	89	18	39.2%	83.2%
<b>West Region:</b>	<b>25,919,261</b>	<b>15,205,406</b>	<b>10,713,855</b>	<b>1,344,972</b>	<b>988,971</b>	<b>356,001</b>	<b>58.7%</b>	<b>73.5%</b>
New Mexico	758,364	511,099	247,265	116,747	85,370	31,377	67.4%	73.1%
Wyoming	223,619	153,894	69,725	26,946	18,999	7,947	68.8%	70.5%
Montana	416,125	282,995	133,130	43,530	31,878	11,652	68.0%	73.2%
Arizona	2,519,052	1,593,014	926,038	223,338	170,318	53,020	63.2%	76.3%
Oregon	1,571,678	969,579	602,099	126,354	98,677	27,677	61.7%	78.1%
Idaho	610,872	418,217	192,655	44,381	29,331	15,050	68.5%	66.1%
Washington	2,768,076	1,729,320	1,038,756	165,807	127,088	38,719	62.5%	76.6%
Nevada	1,055,158	578,762	476,396	51,142	34,324	16,818	54.9%	67.1%
Colorado	2,108,992	1,365,832	743,160	81,738	57,137	24,601	64.8%	69.9%
California	12,944,178	6,943,428	6,000,750	440,202	318,231	121,971	53.6%	72.3%
Utah	943,147	659,266	283,881	24,787	17,618	7,169	69.9%	71.1%

52 U.S. Census Bureau, American Community Survey, 2016, 1-year estimates. Table B25032

Geography	Total occupied housing units	Owner-occupied housing units	Renter-occupied housing units	Total occupied mobile homes	Owner-occupied mobile homes	Renter-occupied mobile homes	Percent of all housing units that are owner-occupied	Percent of mobile homes that are owner-occupied
<b>Midwest Region:</b>	<b>26,467,089</b>	<b>17,806,064</b>	<b>8,661,025</b>	<b>954,447</b>	<b>713,701</b>	<b>240,746</b>	<b>67.3%</b>	<b>71.1%</b>
South Dakota	334,003	224,459	109,544	25,760	18,975	6,785	67.2%	73.7%
Missouri	2,372,190	1,567,597	804,593	131,398	92,808	38,590	66.1%	70.6%
North Dakota	315,134	199,208	115,926	17,066	13,421	3,645	63.2%	78.6%
Michigan	3,884,153	2,731,283	1,152,870	185,580	142,152	43,428	70.3%	76.6%
Indiana	2,533,270	1,731,421	801,849	108,156	76,043	32,113	68.3%	70.3%
Kansas	1,110,407	729,392	381,015	41,158	30,122	11,036	65.7%	73.2%
Ohio	4,624,669	3,022,809	1,601,860	153,198	112,767	40,431	65.4%	73.6%
Iowa	1,247,932	881,435	366,497	40,926	31,313	9,613	70.6%	76.5%
Wisconsin	2,326,998	1,551,232	775,766	64,953	52,185	12,768	66.7%	80.3%
Minnesota	2,148,725	1,532,031	616,694	57,088	48,249	8,839	71.3%	84.5%
Nebraska	747,562	488,339	259,223	18,616	12,914	5,702	65.3%	69.4%
Illinois	4,822,046	3,146,858	1,675,188	110,548	82,752	27,796	65.3%	74.9%
<b>Northeast Region:</b>	<b>20,993,404</b>	<b>12,883,405</b>	<b>8,109,999</b>	<b>465,571</b>	<b>360,747</b>	<b>104,824</b>	<b>61.4%</b>	<b>74.9%</b>
Maine	531,660	382,116	149,544	46,570	37,179	9,391	71.9%	79.8%
Vermont	254,851	177,772	77,079	17,065	12,833	4,232	69.8%	75.2%
New Hampshire	520,643	365,021	155,622	26,788	22,800	3,988	70.1%	85.1%
Pennsylvania	4,937,771	3,382,514	1,555,257	173,901	132,713	41,188	68.5%	76.3%
New York	7,209,054	3,841,170	3,367,884	143,762	109,094	34,668	53.3%	75.9%
Rhode Island	408,239	236,882	171,357	3,503	2,767	736	58.0%	79.0%
New Jersey	3,194,519	2,019,927	1,174,592	25,467	20,653	4,814	63.2%	81.1%
Connecticut	1,357,269	879,073	478,196	10,139	7,949	2,190	64.8%	78.4%
Massachusetts	2,579,398	1,598,930	980,468	18,376	14,759	3,617	62.0%	80.3%
<b>Pacific Region:</b>	<b>704,336</b>	<b>420,841</b>	<b>283,495</b>	<b>12,978</b>	<b>9,453</b>	<b>3,525</b>	<b>59.8%</b>	<b>80.3%</b>
Alaska	248,468	160,215	88,253	12,225	8,907	3,318	64.5%	72.9%
Hawaii	455,868	260,626	195,242	753	546	207	57.2%	72.5%

Appendix Table 3: Vacancy Rates in Mobile/Manufactured Homes<sup>53</sup>

	Total housing units	Total vacant housing units	Total housing units – Mobile home	Vacant mobile homes	Percent of all housing units that are vacant	Percent of mobile homes that are vacant	Percent of vacant mobile homes to all vacant units
<b>United States</b>	<b>135,702,775</b>	<b>16,842,710</b>	<b>8,436,002</b>	<b>1,830,339</b>	<b>12.4%</b>	<b>21.7%</b>	<b>10.9%</b>
<b>South region:</b>	<b>52,153,320</b>	<b>7,377,345</b>	<b>4,937,410</b>	<b>1,109,715</b>	<b>14.1%</b>	<b>22.5%</b>	<b>15.0%</b>
South Carolina	2,236,262	358,375	369,050	69,852	16.0%	18.9%	19.5%
West Virginia	886,710	164,585	136,141	32,355	18.6%	23.8%	19.7%
Mississippi	1,307,492	216,247	197,405	43,554	16.5%	22.1%	20.1%
Alabama	2,230,180	377,662	296,549	67,922	16.9%	22.9%	18.0%
Louisiana	2,037,067	316,266	263,349	58,020	15.5%	22.0%	18.3%
North Carolina	4,540,697	658,274	584,847	110,710	14.5%	18.9%	16.8%
Kentucky	1,965,577	247,871	239,571	52,939	12.6%	22.1%	21.4%
Arkansas	1,354,801	212,083	159,358	41,788	15.7%	26.2%	19.7%
Oklahoma	1,721,072	251,730	163,108	42,989	14.6%	26.4%	17.1%
Georgia	4,219,103	532,968	393,457	80,620	12.6%	20.5%	15.1%
Tennessee	2,919,698	363,366	268,399	53,615	12.4%	20.0%	14.8%
Florida	9,302,140	1,728,684	829,927	228,879	18.6%	27.6%	13.2%
Delaware	426,154	75,069	33,947	11,029	17.6%	32.5%	14.7%
Texas	10,754,268	1,218,656	785,584	169,077	11.3%	21.5%	13.9%
Virginia	3,491,185	370,493	182,937	37,860	10.6%	20.7%	10.2%
Maryland	2,447,211	252,554	33,674	8,506	10.3%	25.3%	3.4%
District of Columbia	313,703	32,462	107	–	10.3%		
<b>West region:</b>	<b>28,783,185</b>	<b>2,863,924</b>	<b>1,646,080</b>	<b>301,108</b>	<b>9.9%</b>	<b>18.3%</b>	<b>10.5%</b>
New Mexico	917,641	159,277	151,525	34,778	17.4%	23.0%	21.8%
Wyoming	270,625	47,006	36,239	9,293	17.4%	25.6%	19.8%
Arizona	2,961,136	442,084	317,464	94,126	14.9%	29.6%	21.3%
Montana	497,749	81,624	52,341	8,811	16.4%	16.8%	10.8%
Oregon	1,732,887	161,209	140,867	14,513	9.3%	10.3%	9.0%
Idaho	700,829	89,957	54,347	9,966	12.8%	18.3%	11.1%
Washington	3,025,802	257,726	188,530	22,723	8.5%	12.1%	8.8%
Nevada	1,221,759	166,601	64,724	13,582	13.6%	21.0%	8.2%
Colorado	2,339,140	230,148	93,474	11,736	9.8%	12.6%	5.1%
California	14,061,375	1,117,197	513,455	73,253	7.9%	14.3%	6.6%
Utah	1,054,242	111,095	33,114	8,327	10.5%	25.1%	7.5%

53 U.S. Census Bureau, American Community Survey, 2016, 1-year estimates. Table DP04

	Total hous- ing units	Total vacant housing units	Total hous- ing units - Mobile home	Vacant mobile homes	Percent of all housing units that are vacant	Percent of mobile homes that are vacant	Percent of vacant mobile homes to all vacant units
<b>Midwest region:</b>	<b>29,964,214</b>	<b>3,497,125</b>	<b>1,239,312</b>	<b>284,865</b>	<b>11.7%</b>	<b>23.0%</b>	<b>8.1%</b>
South Dakota	383,827	49,824	32,890	7,130	13.0%	21.7%	14.3%
North Dakota	368,545	53,411	24,809	7,743	14.5%	31.2%	14.5%
Missouri	2,760,226	388,036	175,558	44,160	14.1%	25.2%	11.4%
Michigan	4,560,164	676,011	240,460	54,880	14.8%	22.8%	8.1%
Indiana	2,854,595	321,325	135,237	27,081	11.3%	20.0%	8.4%
Kansas	1,259,870	149,463	53,482	12,324	11.9%	23.0%	8.2%
Iowa	1,380,087	132,155	50,996	10,070	9.6%	19.7%	7.6%
Ohio	5,164,400	539,731	190,643	37,445	10.5%	19.6%	6.9%
Wisconsin	2,668,443	341,445	95,745	30,792	12.8%	32.2%	9.0%
Nebraska	827,191	79,629	27,691	9,075	9.6%	32.8%	11.4%
Minnesota	2,409,701	260,976	79,572	22,484	10.8%	28.3%	8.6%
Illinois	5,327,165	505,119	132,229	21,681	9.5%	16.4%	4.3%
<b>Northeast region:</b>	<b>23,954,214</b>	<b>2,960,810</b>	<b>596,421</b>	<b>130,850</b>	<b>12.4%</b>	<b>21.9%</b>	<b>4.4%</b>
Maine	730,786	199,126	59,442	12,872	27.2%	21.7%	6.5%
Vermont	329,539	74,688	20,594	3,529	22.7%	17.1%	4.7%
New Hampshire	625,337	104,694	34,897	8,109	16.7%	23.2%	7.7%
Pennsylvania	5,611,995	674,224	220,403	46,502	12.0%	21.1%	6.9%
New York	8,232,039	1,022,985	188,494	44,732	12.4%	23.7%	4.4%
Rhode Island	462,598	54,359	4,481	978	11.8%	21.8%	1.8%
New Jersey	3,604,688	410,169	32,969	7,502	11.4%	22.8%	1.8%
Connecticut	1,499,145	141,876	12,430	2,291	9.5%	18.4%	1.6%
Massachusetts	2,858,087	278,689	22,711	4,335	9.8%	19.1%	1.6%
<b>Pacific region:</b>	<b>847,842</b>	<b>143,506</b>	<b>16,779</b>	<b>3,801</b>	<b>16.9%</b>	<b>22.7%</b>	<b>2.6%</b>
Alaska	310,672	62,204	15,856	3,631	20.0%	22.9%	5.8%
Hawaii	537,170	81,302	923	170	15.1%	18.4%	0.2%

Appendix Table 4: Manufactured Housing Shipments to States<sup>54</sup>

	Shipments to State		Share to Total	
	1994	2017	1994	2017
Alabama	15,263	6,046	5.0%	6.5%
Alaska	88	59	0.0%	0.1%
Arizona	6,258	1,721	2.1%	1.9%
Arkansas	6,516	1,766	2.1%	1.9%
California	4,088	3,681	1.3%	4.0%
Colorado	3,930	934	1.3%	1.0%
Connecticut	100	113	0.0%	0.1%
Delaware	1,452	387	0.5%	0.4%
Dist. of Columbia	0	0	0.0%	0.0%
Florida	17,805	5,855	5.9%	6.3%
Georgia	18,121	2,852	6.0%	3.1%
Hawaii	0	8	0.0%	0.0%
Idaho	3,712	341	1.2%	0.4%
Illinois	4,226	1,344	1.4%	1.4%
Indiana	8,196	1,694	2.7%	1.8%
Iowa	2,598	470	0.9%	0.5%
Kansas	2,872	342	0.9%	0.4%
Kentucky	10,344	2,807	3.4%	3.0%
Louisiana	6,784	5,776	2.2%	6.2%
Maine	1,764	525	0.6%	0.6%
Maryland	943	851	0.3%	0.9%
Massachusetts	202	213	0.1%	0.2%
Michigan	10,059	4,791	3.3%	5.2%
Minnesota	2,611	713	0.9%	0.8%
Mississippi	9,121	3,665	3.0%	3.9%
Missouri	8,274	1,301	2.7%	1.4%

	Shipments to State		Share to Total	
	1994	2017	1994	2017
Montana	1,871	273	0.6%	0.3%
Nebraska	869	186	0.3%	0.2%
Nevada	2,087	425	0.7%	0.5%
New Hampshire	761	392	0.3%	0.4%
New Jersey	318	471	0.1%	0.5%
New Mexico	5,681	1,253	1.9%	1.3%
New York	5,225	1,429	1.7%	1.5%
North Carolina	28,275	3,835	9.3%	4.1%
North Dakota	600	302	0.2%	0.3%
Ohio	7,504	1,912	2.5%	2.1%
Oklahoma	3,877	1,791	1.3%	1.9%
Oregon	7,597	1,408	2.5%	1.5%
Pennsylvania	7,267	1,545	2.4%	1.7%
Rhode Island	39	38	0.0%	0.0%
South Carolina	15,326	3,797	5.0%	4.1%
South Dakota	1,759	259	0.6%	0.3%
Tennessee	13,422	2,664	4.4%	2.9%
Texas	26,339	17,676	8.7%	19.0%
Utah	1,560	275	0.5%	0.3%
Vermont	558	127	0.2%	0.1%
Virginia	6,974	1,266	2.3%	1.4%
Washington	7,332	1,207	2.4%	1.3%
West Virginia	4,471	1,119	1.5%	1.2%
Wisconsin	4,041	612	1.3%	0.7%
Wyoming	598	136	0.2%	0.1%
<b>Dest. Pending *</b>	<b>4,225</b>	<b>249</b>	<b>1.4%</b>	<b>0.3%</b>
<b>Total **</b>	<b>303,903</b>	<b>92,902</b>	<b>100.0%</b>	<b>100.0%</b>

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54 \* Destination Pending represents those units that have not been allocated to a specific state.

\*\* Total figures may include shipments to Canada or Puerto Rico.

Source: Institute for Building Technology & Safety released by the U.S. Census Bureau

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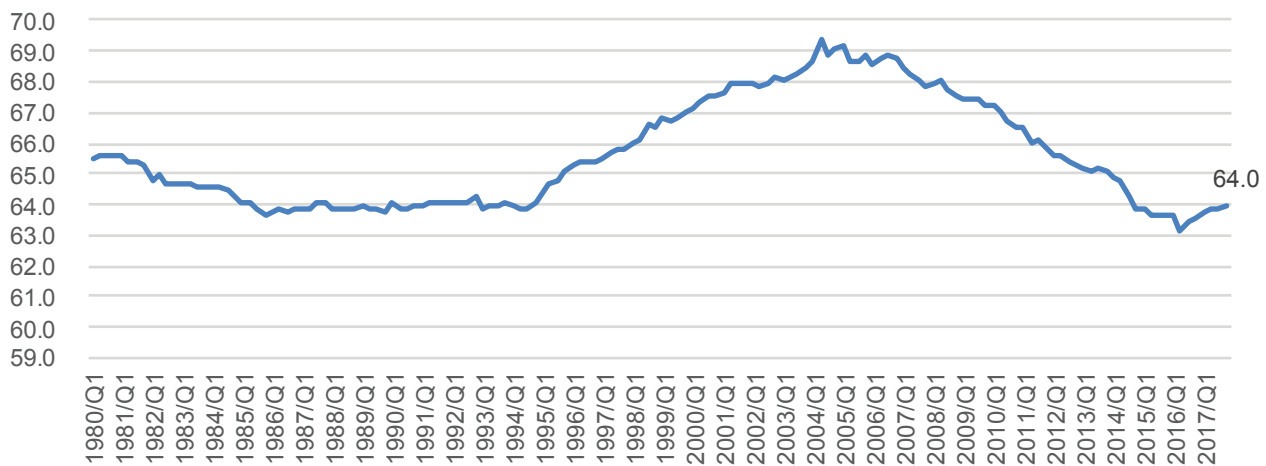


## STATS AND GRAPHS DATA CORNER

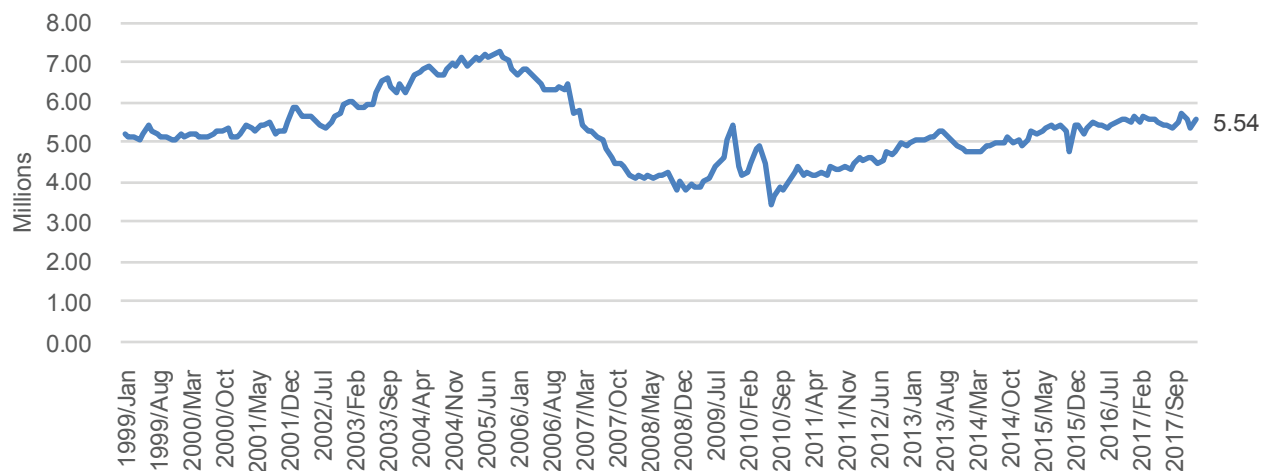
We offer a review, in graphic form, of some industry-related statistics to provide a quick glimpse of some of the underlying trends that influence today's real estate market. Included here are homeownership, mortgage market, household finance, and economic indicators.

### HOMEOWNERSHIP INDICATORS

#### U.S. HOMEOWNERSHIP RATE 1980 Q1–2017 Q4<sup>1</sup>



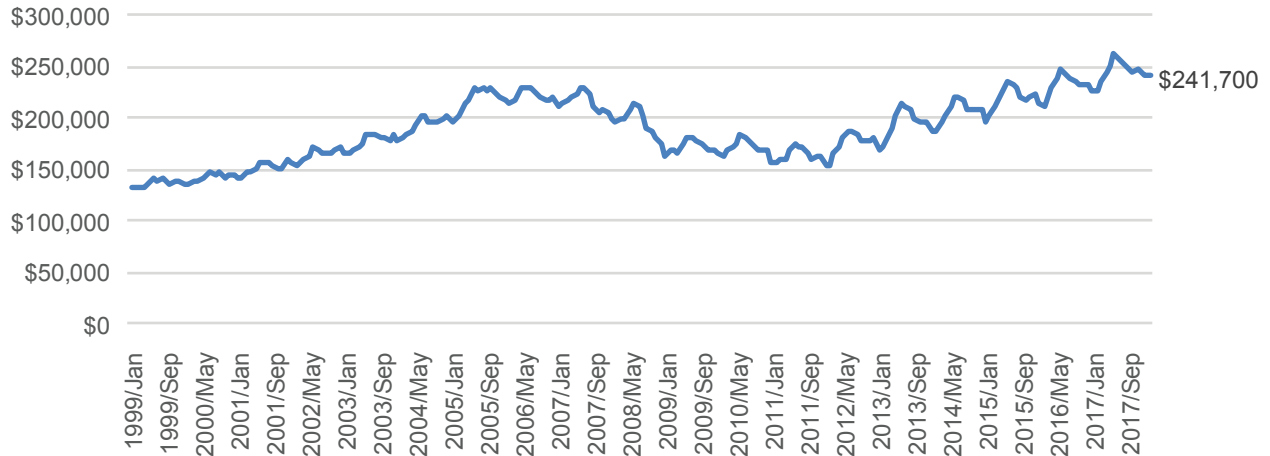
#### TOTAL EXISTING HOME SALES JANUARY 1999–FEBRUARY 2018<sup>2</sup>



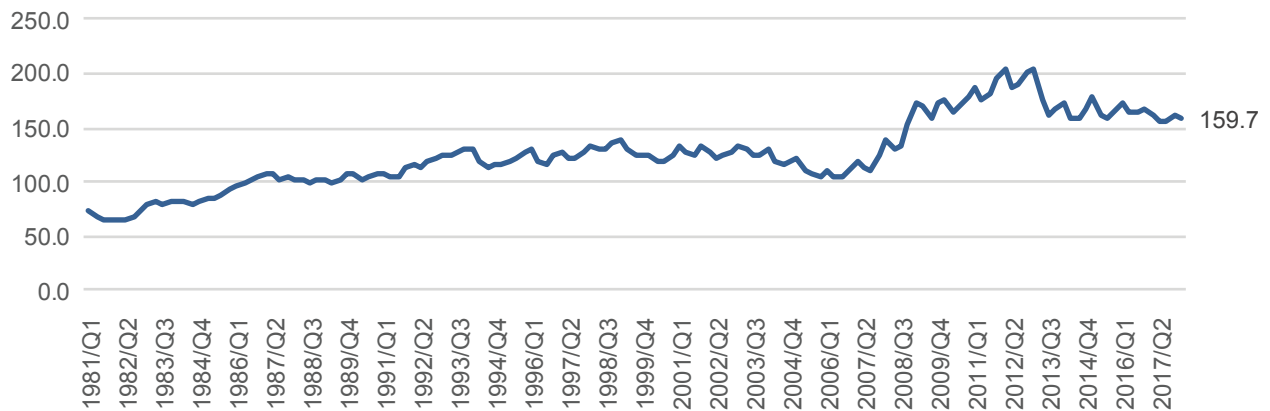
<sup>1</sup> U.S. Census Bureau's Housing Vacancy Survey

<sup>2</sup> National Association of REALTORS®

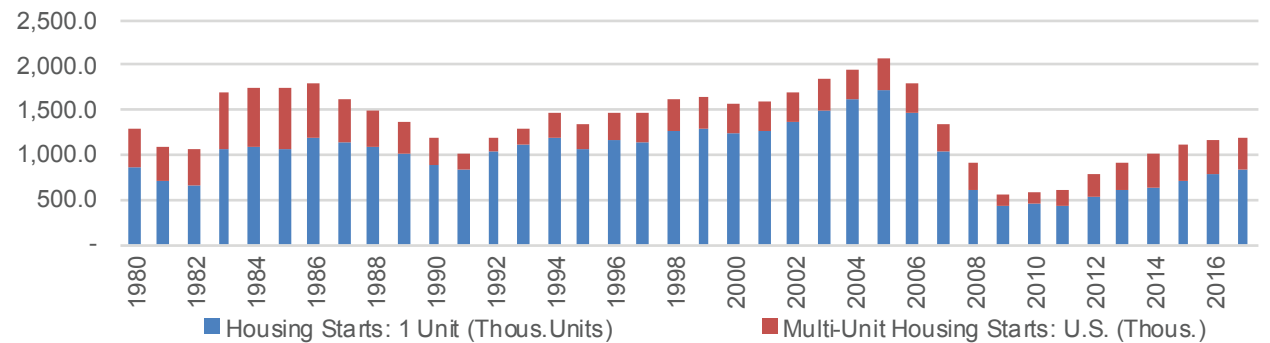
**MEDIAN SALES PRICE OF EXISTING HOMES SOLD JANUARY 1999–FEBRUARY 2018<sup>3</sup>**



**HOUSING AFFORDABILITY INDEX FOR FIXED RATE MORTGAGES 1981 Q1–2018 Q1<sup>4</sup>**



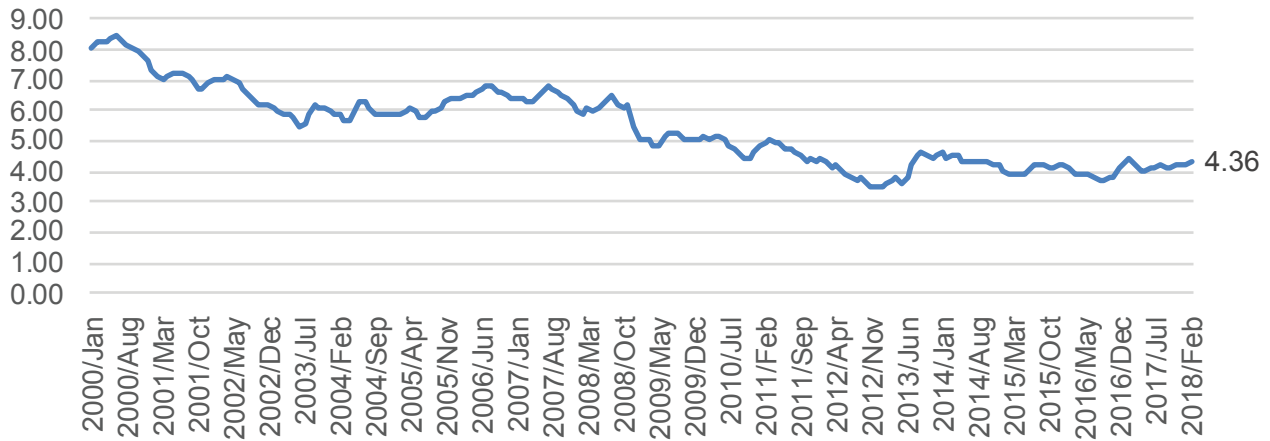
**HOUSING STARTS 1980–2017<sup>5</sup>**



3 National Association of REALTORS<sup>®</sup>  
 4 National Association of REALTORS<sup>®</sup>  
 5 U.S. Census Bureau

**MORTGAGE MARKET INDICATORS**

**CONTRACT INTEREST RATE FOR NONJUMBO FIXED RATE 30-YEAR HOME MORTGAGE LOANS JANUARY 2000–FEBRUARY 2018<sup>6</sup>**



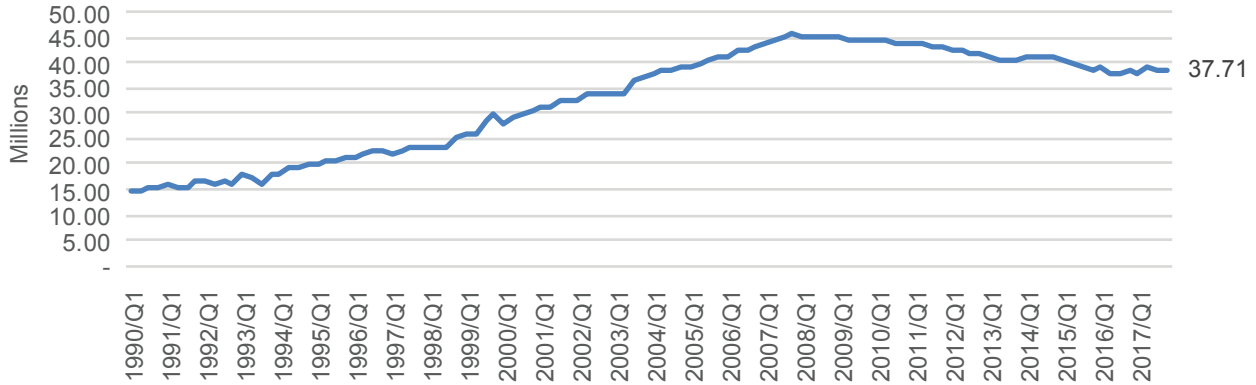
**LOAN-TO-PRICE RATIO OF NONJUMBO FIXED RATE 30-YEAR HOME MORTGAGE LOANS JANUARY 2000–FEBRUARY 2018<sup>7</sup>**



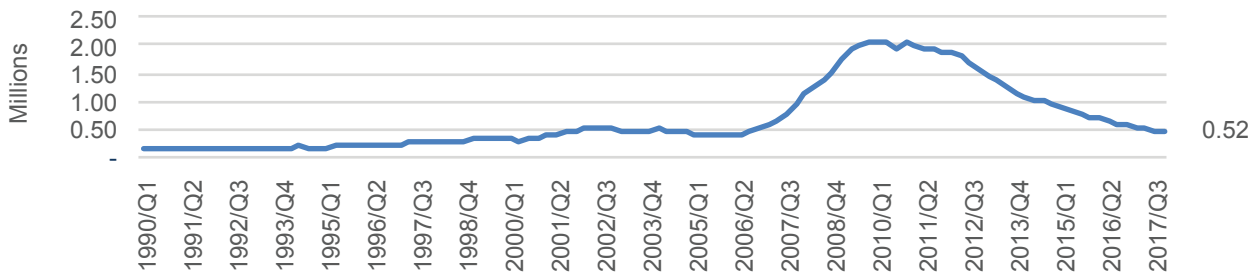
<sup>6</sup> Federal Housing Finance Agency

<sup>7</sup> Federal Housing Finance Agency

**NUMBER OF MORTGAGES SERVICED (IN MILLIONS) 1990 Q1–2017 Q4<sup>8</sup>**



**FORECLOSURE INVENTORY 1991 Q1–2017 Q4<sup>9</sup>**



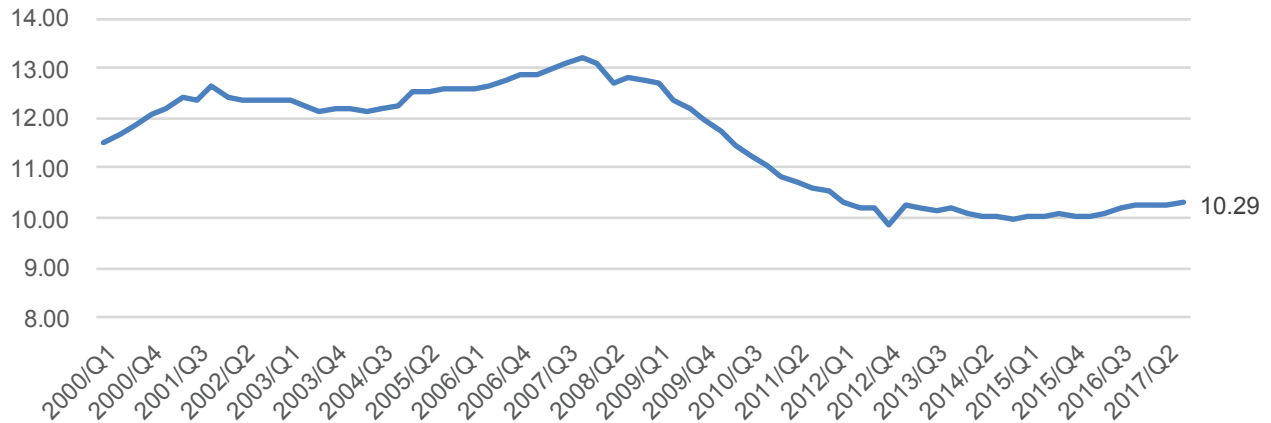
— Mortgage Foreclosure Inventory: United States (EOP, NSA, Number)

8 Mortgage Bankers Association. The number of mortgages serviced (number of loans outstanding at the end of the quarter) includes all delinquent mortgages, nondelinquent mortgages and mortgages in foreclosure.

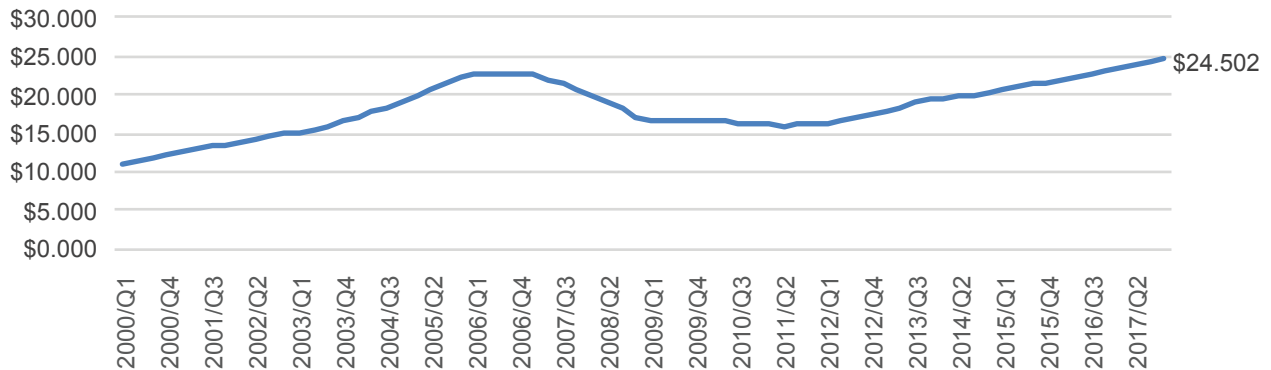
9 Mortgage Bankers Association. Inventory of Mortgages in Foreclosure refers to the total number of loans in the legal process of foreclosure. It includes foreclosures started during the quarter. Some foreclosures included in a quarter may have started in other quarters but have yet to be resolved.

**HOUSEHOLD FINANCE**

**HOUSEHOLD DEBT SERVICE RATIO, 2000 Q1–2017 Q3<sup>10</sup>**



**HOUSEHOLDS' VALUE OF REAL ESTATE ASSETS (IN TRILLIONS OF DOLLARS)  
2000 Q1–2017 Q4<sup>11</sup>**

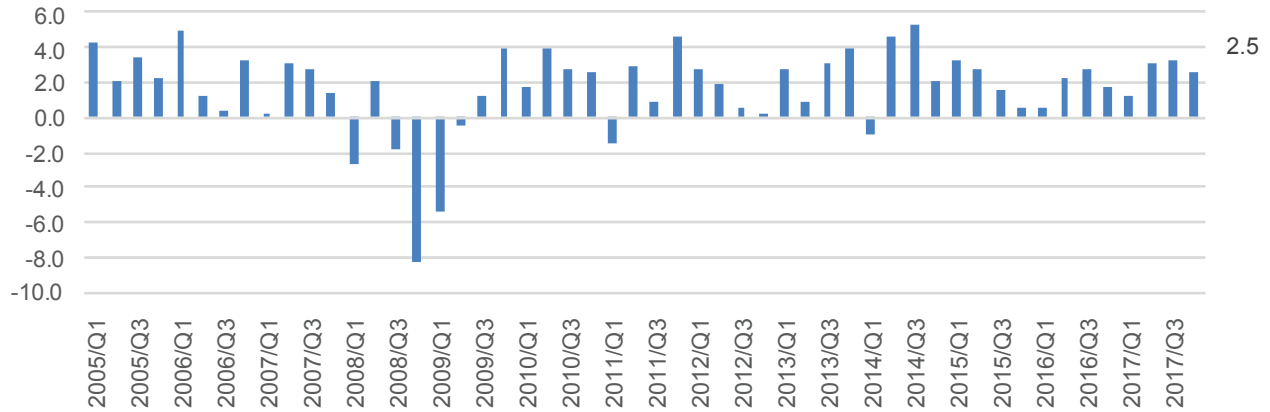


10 Board of Governors of the Federal Reserve System

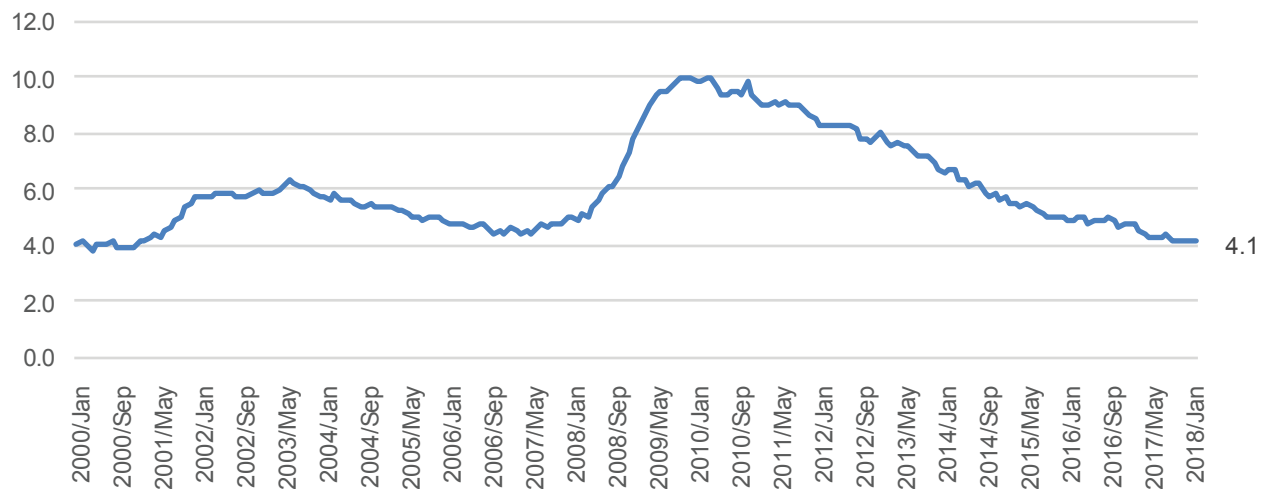
11 Board of Governors of the Federal Reserve System

**ECONOMIC INDICATORS**

**GDP GROWTH RATE 2005 Q1–2017 Q4<sup>12</sup>**



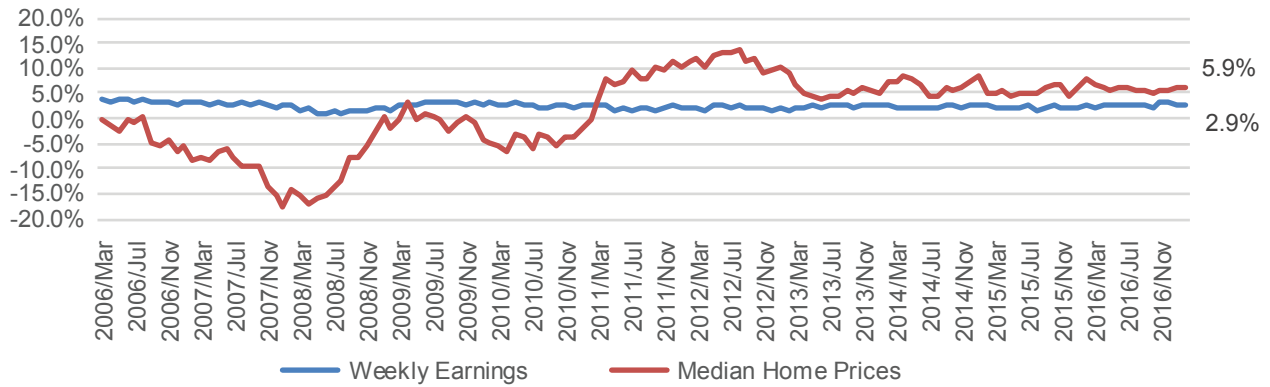
**UNEMPLOYMENT RATE JANUARY 2000–FEBRUARY 2018<sup>13</sup>**



<sup>12</sup> Bureau of Economic Analysis

<sup>13</sup> Bureau of Labor Statistics

**YEAR-ON-YEAR PERCENT CHANGE IN REAL HOURLY EARNINGS OF ALL EMPLOYEES  
MARCH 2006–FEBRUARY 2018<sup>14</sup>**



<sup>14</sup> Bureau of Labor Statistics, NAR



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