Pretium

December 2018

Implications of Rising Mortgage Rates for the SFR Business

Key Conclusions / Implications

- A sharp rise in mortgage rates in 2018 (+95bp YoY) is negatively impacting homebuyer affordability and creating headwinds for parts of the housing market, including new housing starts and homes sales.[1,2]
- While some parts of the housing market will slow with higher rates, others should benefit. We expect higher rates will drive incremental demand for single-family rentals (SFR) as households find attaining homeownership more economically challenging.
- We do not expect higher rates to materially impact the positive trends in new household formations, which should remain resilient due to continued demographic shifts and healthy economic growth.
- While home price appreciation (HPA) and mortgage rates have historically exhibited little correlation, we expect HPA to decelerate from the recent range of 5% to 6% and forecast HPA of ~4% CAGR through 2023.[3]
- We believe the downside risks to home prices today are far lower than in 2006 due to more favorable current and projected supply/demand imbalances, less leveraged consumer balance sheets, and tighter mortgage credit conditions.

Higher Rates Are the 'News' in U.S. Housing

Looking back on the U.S. housing market in 2018, there were three fundamental developments which shaped the year and the medium-term outlook:

1. Demand accelerated with YTD household formations of 1.48mn representing the strongest pace since 2005, continuing a multi-year rebound in demand, supported by population shifts and economic growth.[4]
2. Net new supply continued to lag demand by several hundred thousand units annually, further compressing housing vacancy rates to their lowest level in almost 35 years. Low vacancy rates and low levels of for-sale housing inventory supported home price appreciation and rental rate growth.[5,6]
3. Mortgage rates rose meaningfully (+95bp in 4Q'18 versus 4Q'17), pressuring homebuyer affordability as well as home sales and new home construction activity.[7]

Of these three developments, in our opinion, the significant rise in mortgage rates was the most unexpected change in the recent housing market narrative, wherein the supply and demand mismatch were a continuation of a well understood (if unsustainable) trend (see page 8).

In our view, the rise in mortgage rates presents three distinct but interrelated questions for SFR investors:

1. How will higher mortgage rates / weaker affordability impact SFR demand?
2. How will higher rates impact the outlook for rents and home price appreciation?
3. How do we think about the downside to home prices if we are truly at the end of the housing / economic cycle?

In our view, the sharp change in homeowner affordability, coupled with strong housing demand and tight supply, is likely to drive significant rental demand from households priced out of homeownership due to cost or credit. We expect this increased demand will likely allow for higher occupancy rates, lower turnover, and higher rental rate growth, all else equal. Inside we walk through our thoughts on the impact of rising rates on housing, and the single-family rental business.

[1] Freddie Mac 30-Year Fixed Rate Mortgage Average. Data through November 29, 2018, sourced from St. Louis Fed FRED system on December 4, 2018.

[2] Morgan Stanley, "2019 US Housing and Resi Credit Outlook: Slow and Steady," November 30, 2018.

[3] Pretium Partners estimates.

[4] U.S. Census Bureau, Current Population Survey/Housing Vacancy Survey, table 13a, data through 3Q'18. CoreLogic National HPI and Axiometrics U.S. rental rate data, both through September 2018.

[5] Laurie Goodman, "What Is Holding Back Housing?", Business Economics, April 2018.

[6] Combined for-sale and for-rent vacancy rate, U.S. Census Bureau, Current Population Survey/Housing Vacancy Survey, Series H-111, through 3Q'18.

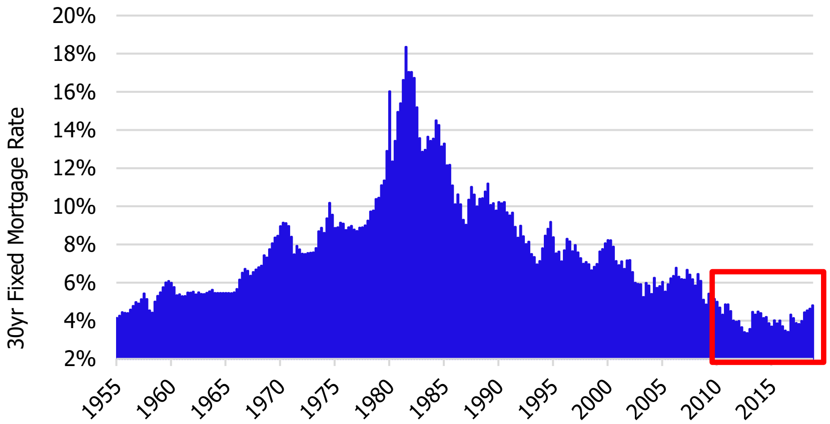
[7] Freddie Mac 30-Year Fixed Rate Mortgage Average. Data through November 29, 2018, sourced from St. Louis Fed FRED system on December 4, 2018.

Section I: Rising Rates and Their Immediate Impacts

Mortgage rates have increased meaningfully with the 30-year Freddie Mac conforming mortgage rate averaging 4.85% in 4Q'18, up more than 90bp from 4Q'17. This increase primarily reflects an increase in the average 10-year Treasury rate (+80bp) and a modest widening of mortgage spreads.[8]

While a 4.85% mortgage rate is modest in historical terms (compared to a 7.5% average since 1955), the rate of increase from the high 3s to the high 4s in one year is significant and has priced out many marginal homebuyers. John Burns Real Estate Consulting estimates that every 50bp of higher mortgage rates prices out 2.5mn entry-level home buyers.[9]

Exhibit 1: 30-Year Mortgage Rates up from Historic Lows

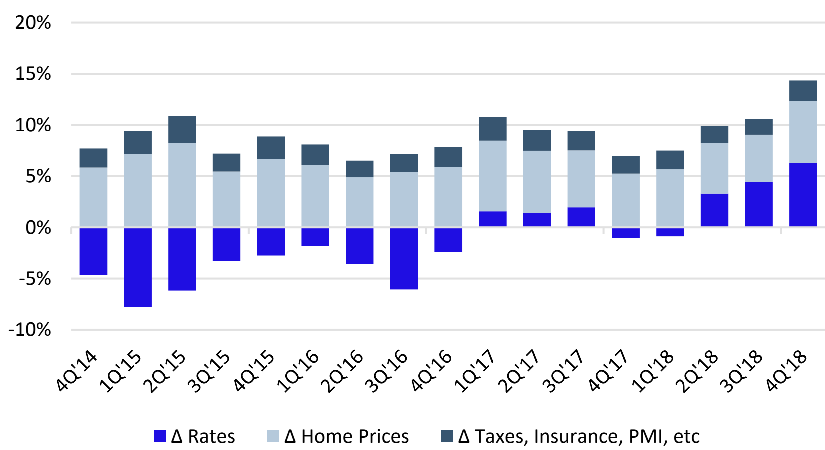


Average Mortgage Rate	
2015	3.9%
2016	3.7%
2017	4.0%
2018	4.5%
4Q'18	**4.85%**

Source: For 1955 to 1971, 30-Year FHA Mortgage Rate: Secondary Market. For 1971 to present, Freddie Mac 30-Year Fixed Rate Mortgage Average. Both data series sourced from St. Louis Fed FRED system on December 4, 2018.

Monthly mortgage payments have increased rapidly on the back of higher rates and rising home prices. The implied monthly mortgage and insurance payment in 4Q'18 is 14% higher than in 4Q'17, and 21% higher than in 4Q'16. This year-over-year increase is in the 85th percentile since 1955.[10]

Exhibit 2: Components of Year-Over-Year Change in Monthly Home Buyer Payment for the Median Home



Source: Pretium Partners calculation using Moody's household income data, U.S. Census Bureau and NAR existing home price data, Fannie Mae 30Yr Mortgage rates, and FHA mortgage insurance premiums.

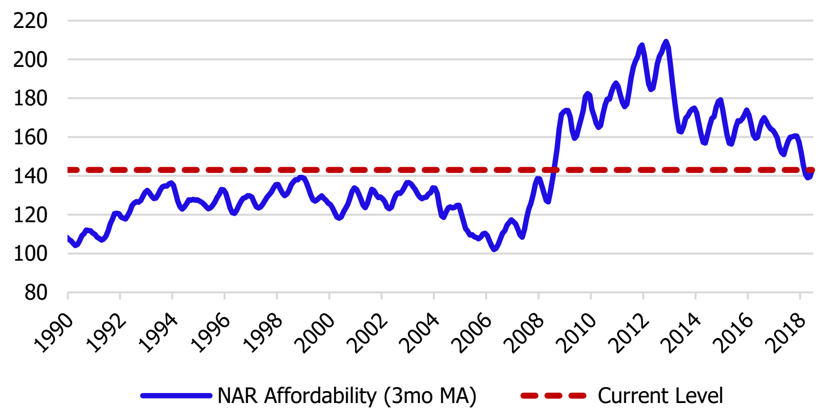
[8] Freddie Mac 30-Year Fixed Rate Mortgage Average. Data sourced from St. Louis Fed FRED system on December 4, 2018.
[9] John Burns Real Estate Consulting, "US Housing Analysis and Forecast", October 2018.
[10] Freddie Mac 30-Year Fixed Rate Mortgage Average. Data sourced from St. Louis Fed FRED system on December 4, 2018.

Impact of Rising Rates on Affordability

Rising mortgage rates have a negative and real-time impact on homebuyer affordability. The recent rise in rates, coupled with home price appreciation, has pushed homebuyer affordability to its lowest levels in a decade.

The National Association of Realtors ("NAR") Composite Affordability Index, was 140 in September 2018 on a trailing three-month basis (100 = median family earns enough income to qualify for a mortgage on a median priced home). This was near the lowest level since 2008 and compares to an average of 175 since 2017 and an average of 139 over the course of the data series from 1988-2017.[11]

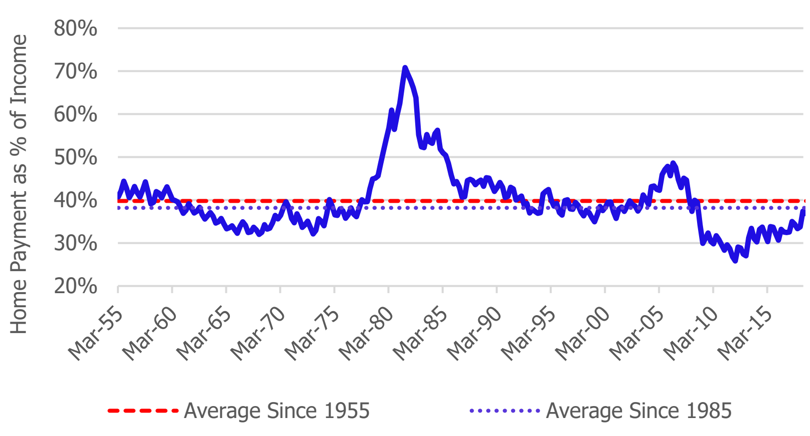
Exhibit 3: NAR's Affordability Index Back to Late 2008 Levels



Source: National Association of Realtors Composite Affordability Index, through September 2018.

Another way to show affordability is to estimate median home payment-to-income ratios over time. In 4Q'18 this index showed that the median U.S. family buying a median-priced home would spend 37% of its income on home payments. The 4Q'18 reading is in line with the 38% average since 1985, but below the 40% average since 1955.[12]

Exhibit 4: Home Payments as % of Income Back to LT Average



Like the NAR chart above, the figure to the left illustrates that affordability for the marginal homebuyer is now back to pre-crisis levels after being much more affordable post-crisis due to low mortgage rates and depressed home values.

Source: Pretium Partners calculation using Moody's income data, U.S. Census Bureau and NAR existing home price data, Fannie Mae 30Yr Mortgage rates, FHA mortgage insurance premiums.

[11] U.S. Census Bureau and National Association of Realtors, Existing Homes Sales report, through September 2018.

[12] Pretium Partners calculation using Moody's income data, U.S. Census and NAR existing home price data, Fannie Mae 30Yr Mortgage rates, FHA mortgage insurance premiums, and the forward treasury curve from Bloomberg as of November 27, 2018. For all periods, calculation assumes a 96.5% LTV FHA loan with 85bp of mortgage insurance, taxes equal to 1.2% of home value, insurance equal to 50bp of home value, and HOA fees of 15bp of home value.

Impact of Rising Rates on Housing Market Activity

Rising rates do and will impact certain segments of the housing market. In fact, tighter affordability is having an adverse impact on housing market activity, with starts and home sales growth decelerating through the year.

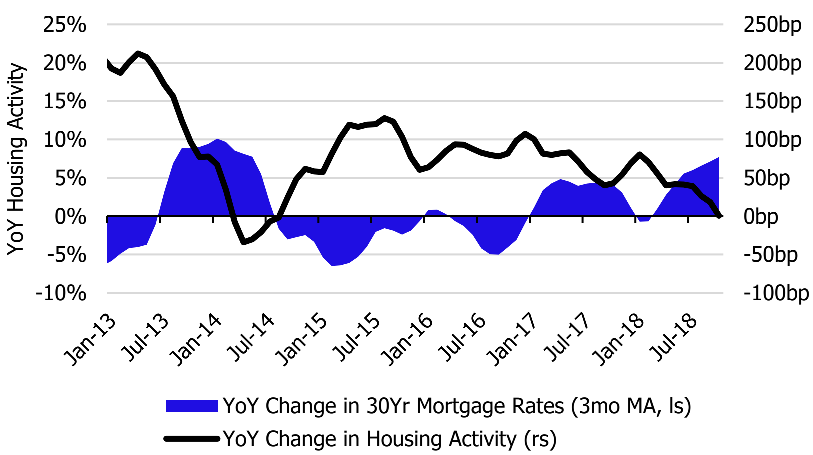
Morgan Stanley's housing research team noted that new home sales are growing at their slowest pace since 1Q'15, with existing home sales showing year-over-year decreases for the first time since the Taper Tantrum (in the Spring of 2013). In their view, "[d]ecreased affordability is weighing on transaction volumes…While we believe affordability to be the chief culprit, the lack of supply is not helping matters… We expect these pressures to remain in 2019."[13]

This should not come as a surprise: home buying is a highly leveraged consumer discretionary purchase with demand for the good (and the production by the home building industry) correlated to the availability and pricing of financing.

- Evercore-ISI wrote, "Within the existing market, we believe that rising rates will remain a headwind to mobility, as homeowners grow increasingly reluctant to swap out of their low-rate mortgages, and this should drive declines in existing home sales over the next several years."[14]
- Since 1971, there has been a -.45 to -.50 correlation between the year-over-year increase in mortgage rates and the year-over-year change in new single-family home sales and single-family housing starts.
- For existing home sales, there has been a -.30 correlation between the pace of existing home sales and mortgage rates, with this data starting in the mid-1980s.

We would expect continued pressure on home sales and starts if rates continue to rise, as demand for for-sale housing adjusts to its higher cost.

Exhibit 5: Home Sales and Starts Slow When Rates Rise



The "Housing Activity" metric is a simple average of the year-over-year change in housing starts, new home sales, and existing home sales.

Source: U.S. Census Bureau and U.S. Department of Housing and Urban Development, New One Family Houses Sold: United States, October 2018. U.S. Census Bureau and U.S. Department of Housing and Urban Development, Privately Owned Housing Starts: 1-Unit Structures, October 2018. National Association of Realtors, Existing Home Sales, October 2018.

[13] Morgan Stanley, "2019 US Housing and Resi Credit Outlook: Slow and Steady," November 30, 2018.
[14] Evercore-ISI, "Updating Macro Housing Forecasts", November 21, 2018.

Section II: Rates and Their Impact on SFR Demand

We believe that weaker new homebuyer affordability at a time of strong household formations will increase rental demand as households, on the margin, find home buying less affordable.

We expect an increase in single-family rental demand in an environment of deteriorating homebuyer affordability.

- SFR is one-third of the rental market and should therefore benefit as more households rent. Further, single-family detached homes share many of the amenities of for-sale entry-level housing which are attractive to residents, especially those with children (access to schools, more square footage inside and outside of the home)
- It is important to emphasize that SFR has historically represented a large share of rentals and overall housing. Since 1970, single-family rentals have comprised, on average, ~11.5% of U.S. housing and ~33% of rental housing[15]
- In a recent report, John Burns Real Estate Consulting emphasized the positive SFR demand impact of worsening affordability, "Worsening affordability should keep SFR tenants in place longer, as an increasing amount will not be able to qualify for a mortgage as rates home values rise."[16]

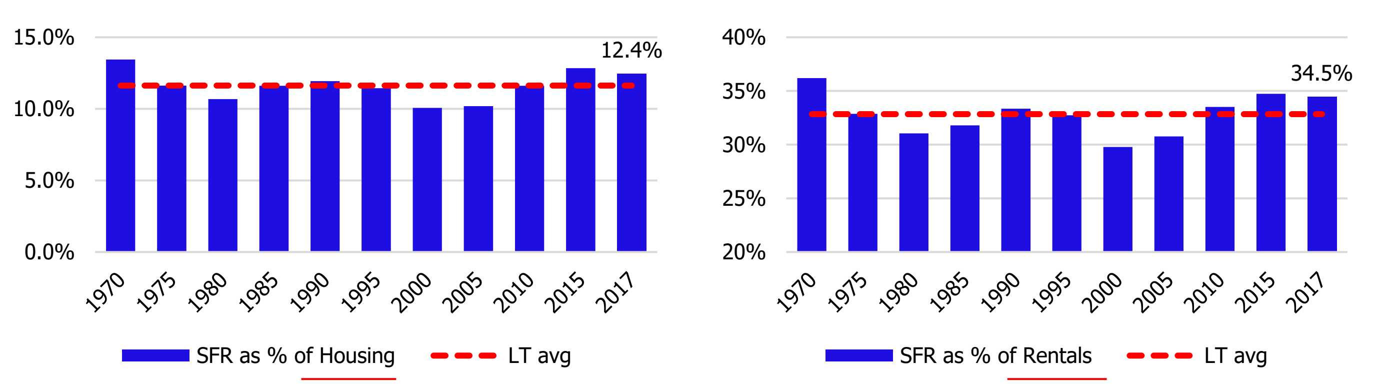
We do not expect higher rates will materially impact the positive trends in household formations. Economic growth, coupled with the ageing of the Millennial generation, is likely to produce significant housing demand as these younger cohorts age into their early to late 30s over the next decade.

Interestingly, to date the younger cohorts have not driven the positive trends in household formation. According to Morgan Stanley, "25- to 29-year-olds have not formed households this slowly in 55 years. For 30- to 34-year-olds, headship rates are at 46-year lows."[17] We would expect as these generations form households at more historically normal levels, for significant long-term housing demand growth.

In our view, the homeownership rate is unlikely to move higher in the coming years, which should add to incremental rental demand.

- We expect that still-tight mortgage credit availability and weak affordability will lead more households to rent, even before considering any potential change in homebuyer preference due to generational attitudes, weaker young adult balance sheets, etc.
- Interestingly, a recent Urban Institute report points to evidence of a shift in housing preference among Millennials not explained by changing family dynamics or credit conditions. For example, homeownership for 25-34-year-old married couples with children was 56.6% in 2015, down ~900bp from 2005 and 540bp from 1990 levels[18]

Exhibit 6: Single-Family Rentals as % of U.S. Housing and Rentals



Source: U.S. Census Bureau. For 1970-1995 data, we use the American Housing Survey data. For 2000 and 2010 we use the Decennial Census. For 2005, 2015, and 2017 we use the American Community Survey 1 Year Survey. Any error in combining these various data series is ours.

[15] U.S. Census Bureau. For 1970-1995 data, we use the American Housing Survey data. For 2000 and 2010, we use the Decennial Census. For 2005, 2015, and 2017, we use the American Community Survey 1-Year Survey.

[16] John Burns Real Estate Consulting, "Single-Family Rental Analysis and Forecast", November 2018.

[17] Morgan Stanley, "2019 US Housing and Resi Credit Outlook: Slow and Steady," November 30, 2018.

[18] Urban Institute, "Millennial Homeownership, Why Is It So Low, and How Can We Increase It?" July 2018.

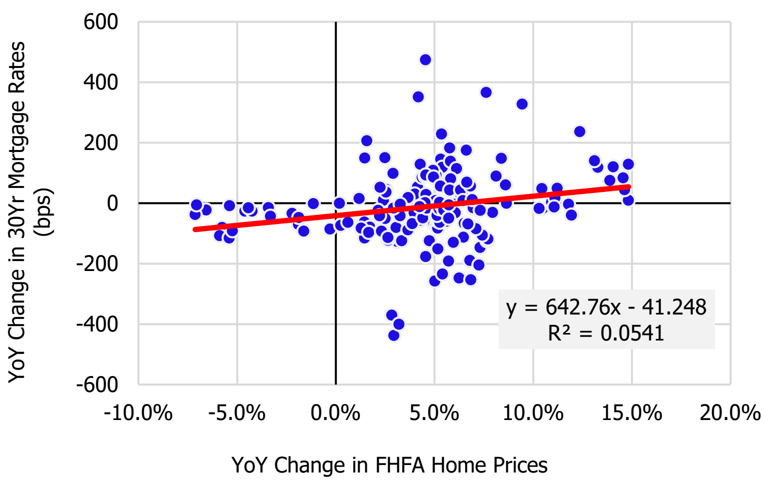
Section III: Rates and Their Impact on HPA

Historically, home prices have exhibited little correlation with mortgage rates. Over the next five years, we expect HPA to continue to increase at an above-inflation pace due to strong fundamentals. However, we would not be surprised to see slower HPA in the near-term due to weaker homebuyer affordability.

In March 2018, we reported on the low, long-term correlations between home prices and interest rates, mortgage rates, and financial assets (please contact us for a copy of the report). Below we update our previous analysis, but retain our earlier conclusions, including:

- Historically, residential real estate prices have exhibited little correlation with either 10Yr Treasury yields or 30Yr mortgage rates (~0.20 for each over the past 40 years).[19]
- While higher rates initially impact affordability, more robust economic growth and consumer confidence support household formations and housing demand. In fact, home prices have a much higher correlation with GDP and employment growth over time than with rates.[20]

Exhibit 7: Year-Over-Year Change in 30Yr Mortgage Rates and FHFA Home Price Index, 1976-2018



Source: Freddie Mac, 30-Year Fixed Rate Mortgage Average in the United States. U.S. Federal Housing Finance Agency, All-Transactions House Price Index for the United States, as of Q3 2018.

[19] Freddie Mac, 30-Year Fixed Rate Mortgage Average in the United States. U.S. Federal Housing Finance Agency, All-Transactions House Price Index for the United States, as of Q3 2018.

[20] Correlation analysis of Freddie Mac 30 Year Mortgage Rate, 10 Year Treasury Rates, Nominal GDP, and Non-Farm Employment from 1975-2017. All data sourced from St. Louis Fed FRED data system through 4Q'17.

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Section IV: Downside Risk to the Housing Market from Rates

Fundamental reasons why this housing cycle is different and has limited downside in our view:

- Tight credit availability in this cycle limited buying by speculators and those with weaker credit
- Fundamentally, demand has and continues to outpace supply. Vacancy / inventory at lowest levels since 1980s
- Home prices are only 5.5% above prior peak (14% below peak on an inflation adjusted basis), and are rising due to demand and escalating replacement costs which support higher prices for existing homes
- Consumers have spent this cycle deleveraging their homes = less distress in the next downcycle

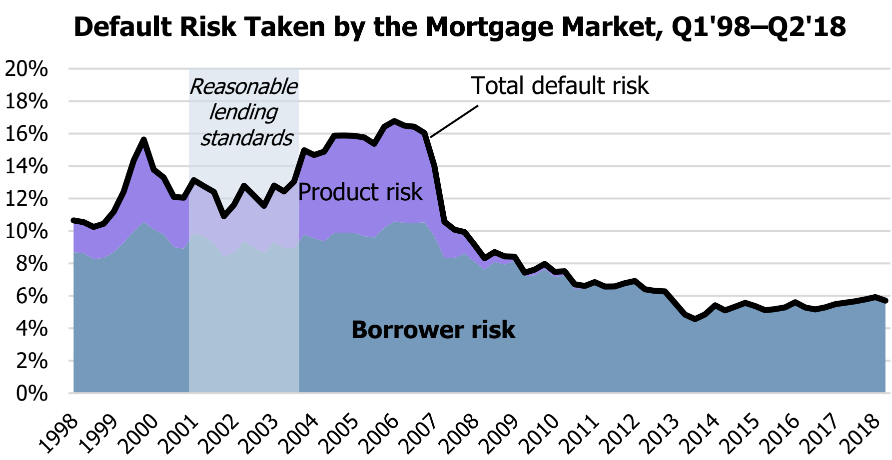
1. Mortgage Credit Was Far More Constrained This Cycle

Loose lending standards in the last cycle encouraged record-high homeownership rates and encouraged riskier borrowers (and borrowers in general) to leverage their homes with considerable debt.

In this cycle, mortgage credit availability has been constrained across lending channels, with average FICO scores on new purchase loans 50 points higher on FHA loans and 20-30 points higher on Fannie / Freddie loans.[21] The chart below from the Urban Institute illustrates that the mortgage market is taking about half as much default risk on new loans today than it took in 2005-07, primarily by eliminating riskier loans (Alt-A, subprime, etc.). According to the Urban Institute, "If the current default risk was doubled across all channels, risk would still be well within the pre-crisis standard of 12.5 percent from 2001 to 2003 for the whole mortgage market."[22]

We believe that more conservative lending standards this cycle will lead to far fewer mortgage delinquencies and defaults in the next cycle.

Exhibit 8: Urban Institute Housing Credit Availability Index



Source: Urban Institute, Housing Credit Availability Index, Q2'18. Updated July 12, 2018. Data from eMBS, CoreLogic, HMDA, IMF, and Urban Institute.

[21] Goldman Sachs, Housing and Mortgage Monitor, November 28, 2018.

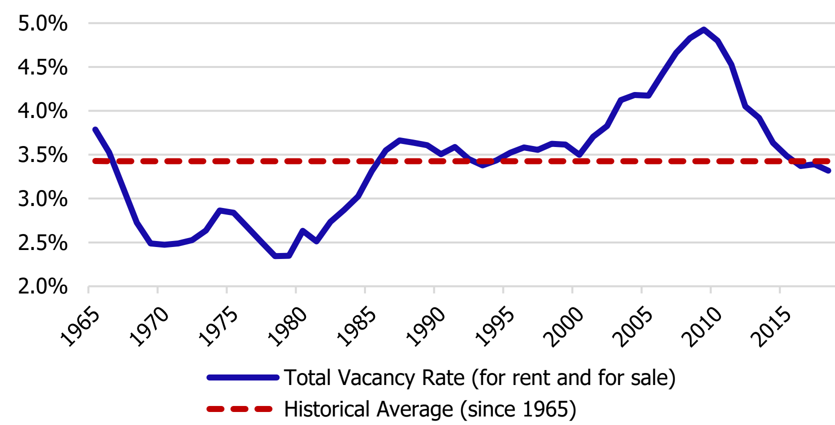
[22] Urban Institute, Housing Credit Availability Index, Q2'18. https://www.urban.org/policy-centers/housing-finance-policy-center/projects/housing-credit-availability-index.

2. Tight Housing Fundamentals Provides Downside Protection

Unlike the 2005-2007 period where the U.S. saw high levels of housing vacancy / oversupply, the U.S. housing market today is characterized by decades-low vacancy rates and an undersupply of housing. We believe that in a downturn, prices are unlikely to decline materially with vacancy / availability starting at such a low level.

According to the U.S. Census Bureau, vacancy rates of for-sale and for-rent housing in 2018 through 3Q'18 were 3.3%, down 7bp Y/Y, and at the lowest level since the early 1980s.

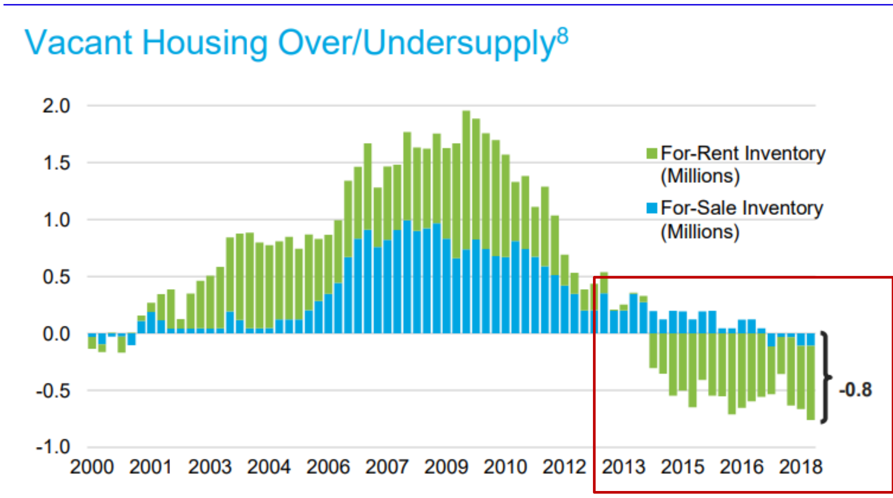
Exhibit 9: Housing Vacancy Rates, 1965-2018



Source: U.S. Census Bureau, Current Population Survey/Housing Vacancy Survey, Series H-111, through 3Q'18.

Freddie Mac estimates the cumulative supply / demand deficit for vacant and available homes. Since 2008, demand for shelter in the U.S. has far outpaced new housing supply resulting in a deficit in housing production versus household formations, especially for rental housing (green bars).[23]

Exhibit 10: Difference Between U.S. Housing Supply and Demand, cumulative



Source: Freddie Mac, Investor Presentation, November 2018.

[23] Freddie Mac, Investor Presentation, August 2018.

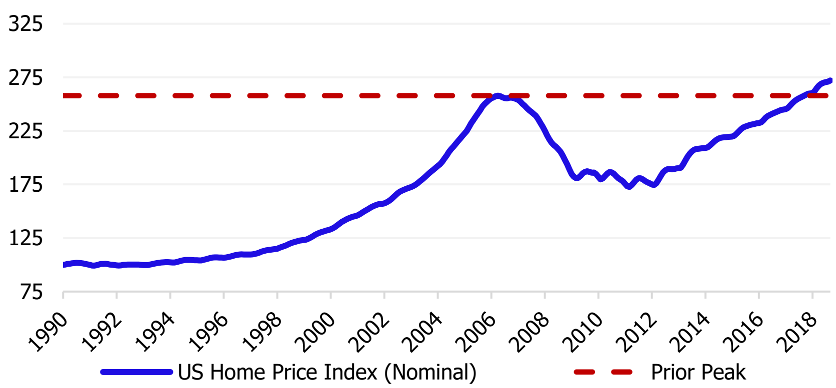
3. Home prices rising with incomes, replacement costs

U.S. home prices have appreciated since 2012 and are now ~5.5% above the prior peak on a nominal basis. Adjusted for inflation, home prices are 14% below prior peak on a real basis.

Further, it's important to recognize the pace and reasons why home prices appreciated this cycle compared to the last cycle.

- In the last housing cycle, U.S. home prices increased by 9.4% in 2002, 10.8% in 2003, 15.7% in 2004, and 15.3% in 2005 before flattening in 2006 and starting their decline in 2007. This pace of appreciation was well above household income growth, and, arguably, fueled by loose credit and speculation more than fundamentals.
- In this cycle, price gains have been more measured, with national HPA of 5.0% in 2014, 5.7% in 2015, 5.6% in 2016, and 6.2% in 2017.[24] This pace is more consistent with both strong fundamental demand and income growth, and the rising costs of new home construction due to land, labor, materials, and regulatory costs.
- According to Zelman & Associates, homebuilder labor and materials inflation has accelerated from +3.8% YoY in 2017, to +4.9% YoY YTD. To offset cost inflation, new home price appreciated +7.3% in 2017 and +8.9% YTD.[25]
- Evercore-ISI's homebuilding research summarized this dynamic as, "Unlike the rampant speculative buying that marked the last housing bubble, today's demand is far more need-based, driven by significant pent-up demand for household formations that is now being released."[26]

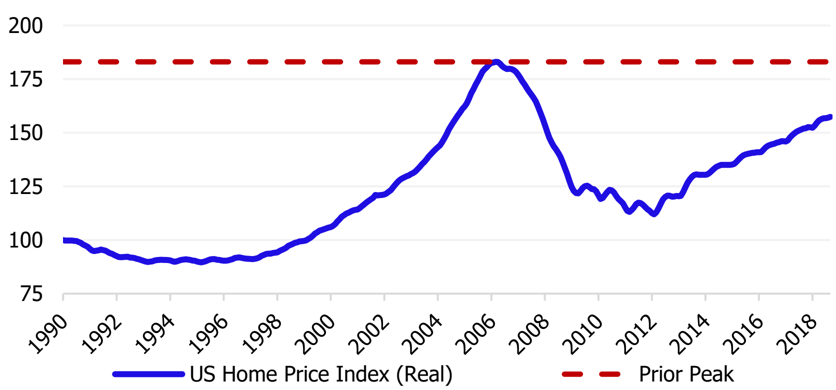
Exhibit 11: CoreLogic Nominal Home Price Index



Nominal home prices are 5.5% above their prior peak level

Source: CoreLogic National HPI, updated through September 2018.

Exhibit 12: CoreLogic Home Price Index, adjusted for inflation



Adjusted for inflation, home prices are 14% below their prior peak level

Source: CoreLogic National HPI, updated through September 2018. Index deflated using Core Personal Consumer Expenditures, downloaded from the St. Louis FRED data system on November 27, 2018

[24] CoreLogic National HPI.
[25] Zelman and Associates, "Frequent Topics of Discussion", November 2018.
[26] Evercore-ISI, "The Sun Also Rises: Upgrading the Homebuilders", October 25, 2018.

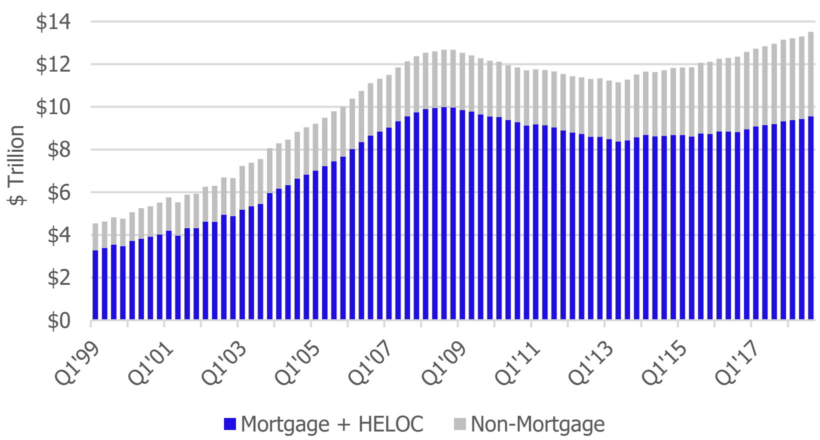
4. U.S. Consumers Deleveraged their Homes This Cycle

The U.S. housing system has far less leverage today – and we, therefore, expect far less credit-induced stress in the housing system when the next recession occurs.

From 2008 to 2018, U.S. consumers shed $500bn of mortgage debt. Overall, consumers have increased their debt burden, but that has come primarily from higher student and auto debt, but lower mortgage and credit card debt.[27]

- In 3Q'08, U.S. consumers held $9.99tn of mortgages and home equity lines of credit, equivalent to ~$89k of housing debt per household.
- In 3Q'18, U.S. consumers held $9.56tn of mortgages and home equity lines of credit, equivalent to ~$80k of housing debt per household.

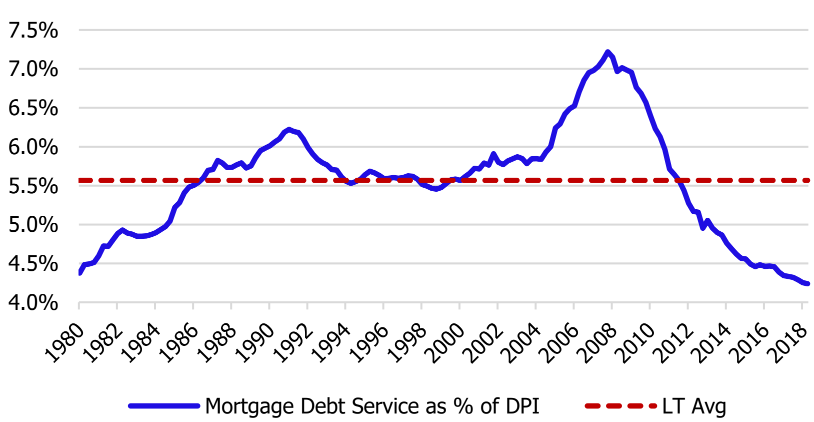
Exhibit 13: Total U.S. Household Mortgage and Non-Mortgage Debt



Source: Federal Reserve Bank of New York, Household Debt and Credit Report. Data through 3Q'18.

Further, a decade of low rates allowed those with mortgages to lock in lower rates, thereby improving their debt coverage ratios. Currently, mortgage service amounts to ~4.2% of disposable income on average, down from 7.2% in 2007, and a long-run average of ~5.5%.[28]

Exhibit 14: U.S. Mortgage Debt Service as % of Disposable Income



Source: Board of Governors of the Federal Reserve System, Household Debt Service and Financial Obligations Ratios.

[27] Federal Reserve Bank of New York, Household Debt and Credit Report. Data through 3Q'18.

[28] Board of Governors of the Federal Reserve System, Household Debt Service and Financial Obligations Ratios

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