Empirical Research Partners

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# The U.S. Consumer: The Housing Cycle October 2017

## *In Balance on Balance*

*The Opposite of Retail*

- The balance of supply and demand is a tenuous one for many industries across the consumer landscape. Demand is generally good with real spending growth tracking in line with its historical average. Supply has been the wildcard. We see this most clearly in the retail and media industries. In many ways, the housing market is the polar opposite.
- Barriers to entry, which are falling elsewhere, are rising in housing. Lending standards have played a role by judiciously limiting the availability of credit, keeping a lid on capacity growth. The-top ten publicly traded builders have seen their market share increase from 24% to over 27% over the past five years. They have done so even as the inventory of land and options on-hand fell by a third. Builders are essentially doing more with less. Other sectors are doing less with more.

*Forward Progress on Household Formation*

- After years of under-punching their weight, the growth rate in home owners has recently begun to outpace that of renters. The data also indicate that families with incomes below the median are once again beginning to become owners. That is consistent with our work on the consumer, which finds that wage and aggregate income growth is beginning to favor those in the middle of the economic pyramid.
- Many question whether today's young adults value the American Dream as dearly as their predecessors. Millennials have become more accepting of living in their parent's home, but those eager to leave home still outnumber those eager to stay at home by a factor of more than three-to-one. Employment matters as well. Young men that are employed are 40% less likely to live with parents than the unemployed. A rising employment-to-population ratio for young adults bodes well.

*Too Much of a Good Thing?*

- Over the past six months houses have been staying on the market for 65 days, down from an average of 80 days in 2015 and 2016. This has created upward pricing pressure that has been greatest at the low-end of the market. It is possible that the current supply-and-demand balance ends up being too much of a good thing, but with favorable income dynamics and so much pent-up demand in the system we do not see that as a risk worth embracing.
- Housing-related stocks feature prominently in our theme-based portfolio called the Consumer Lens, but the challenge for investors is to capitalize on favorable trends without over-staying their welcome. A historical perspective helps. Since 1974, homebuilders as a group have fared best when mortgage rates are low and rising. The only concerning scenario seems to be when rates are falling from high levels. That scenario is not likely to arise in the near future. Supply dynamics and the yield curve are still favorable for the outlook.

*Follow the Fundamentals*

- Our best advice is to forge ahead and follow the fundamentals with a particular focus on three factors: (i) controversy as measured by arbitrage risk, (ii) capital deployment and (iii) valuation. These have been the best guides for stock selection in the group over both the long and shorter-term. With ROEs improving alongside strong demand, the market is pricing homebuilders to reflect unremarkable growth prospects. This might be a conservative set of expectations. We provide a list of housing-related stocks that have high ROEs, attractive valuations and deploy capital mindfully in Appendix 1 on page 14.

*Stay in School*

- Student debt is like a $1.4 trillion "elephant in the room", but research from the Boston Fed has found little linkage between student debt and household formation. Other studies have found that student debt is better than the alternative of not going to college. According to the New York Fed, the presence of student debt delays homeownership early on, but this dynamic fades over time. Those without a college education are far less likely to own homes with or without student debt. And those that fail to graduate are far more likely to "boomerang" home. Stay in school!

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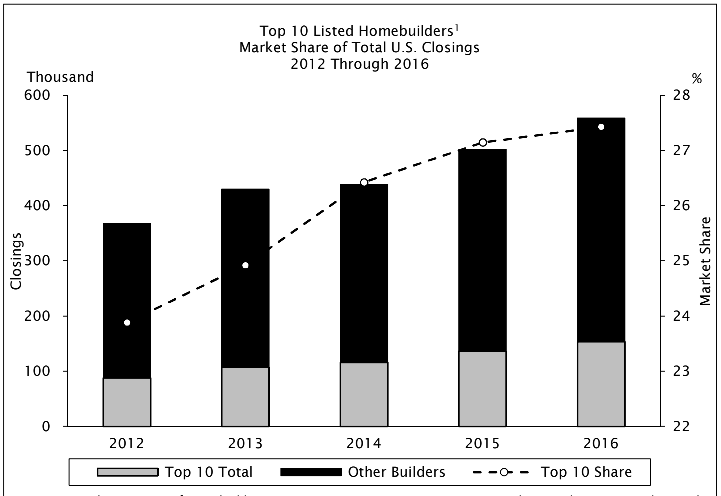
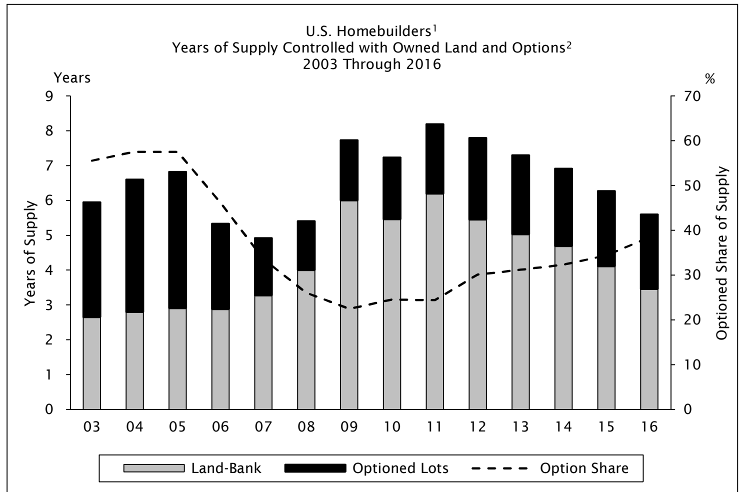
# Conclusions in Brief

- Unlike other consumer industries, homebuilders are doing more….



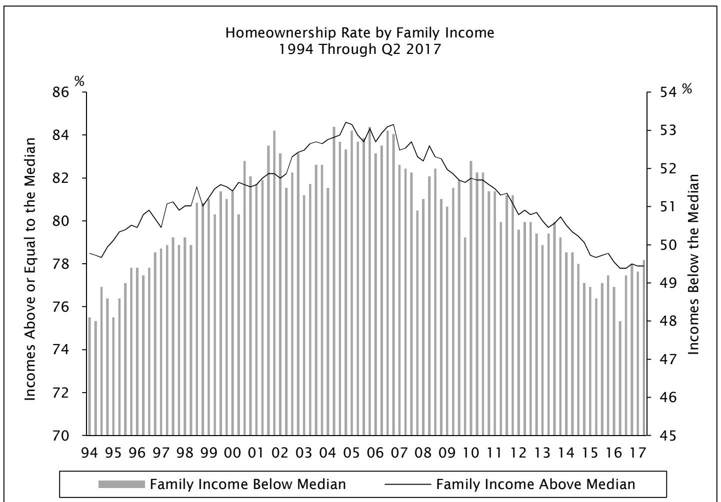

Source: National Association of Homebuilders, Corporate Reports, Census Bureau, Empirical Research Partners Analysis and Estimates.
[1] List includes: DRI, PHM, LEN, NVR, KBH, HOV, RYL, BZH, MTH, MDC.

- ….With less:



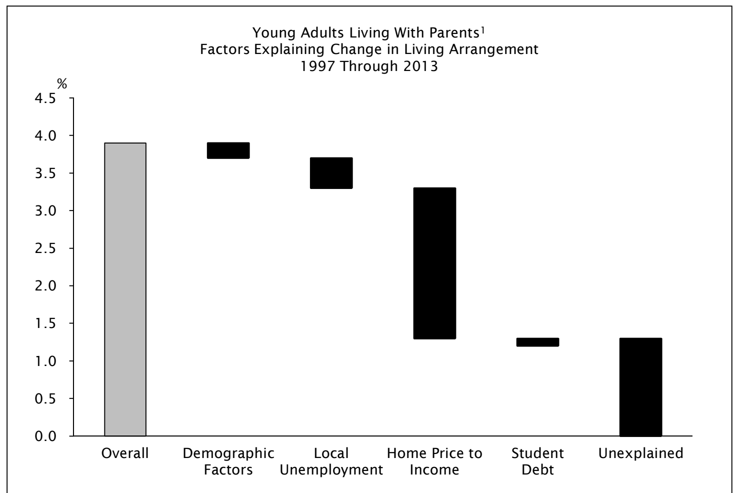

Source: Corporate Reports, Factset, Empirical Research Partners Analysis and Estimates.
[1] Companies include: DHI, NVR, TOL, LEN, PHM, BZH, KBH, CAA.
[2] Years of supply measured relative to deliveries.

- Consistent with our "tail of the whip" thesis, moderate income families are starting to return to home onwership:



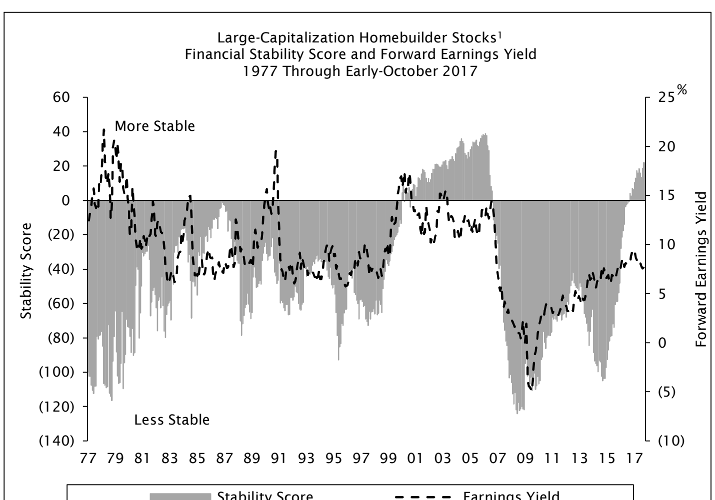

Source: Census Bureau, Empirical Research Partners Analysis.

- …But upward pressure on home prices bears watching:



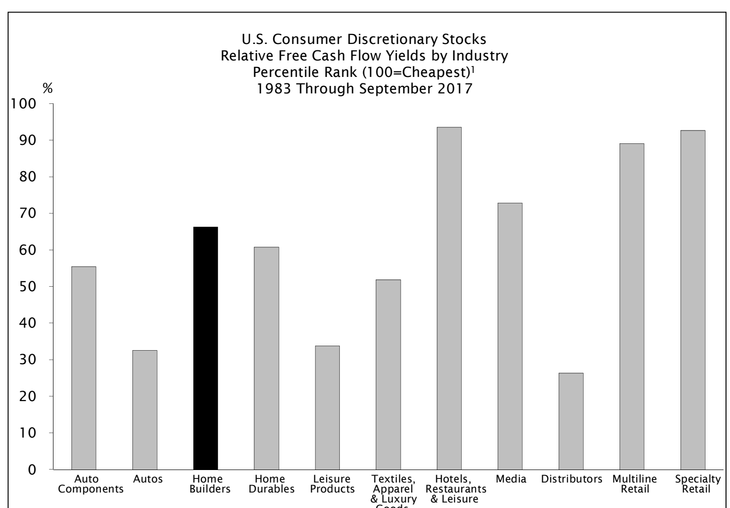

Source: Cooper, D., and Maria Jose Luego-Prado, "Household Formation over Time: Evidence from Two Cohorts of Young Adults", 2017, Boston Fed, Longitudinal Survey of Youth, Empirical Research Partners Analysis.
[1] 23-33 year olds in 1997 cohort compared to 1979 cohort.

- Builders offer improving financial stability without a corresponding premium in multiples…




Source: Empirical Research Partners Analysis.
[1] Equal-weighted data.

- ...And some other household durables stocks are also well-positioned:




Source: Corporate Reports, Empirical Research Partners Analysis.

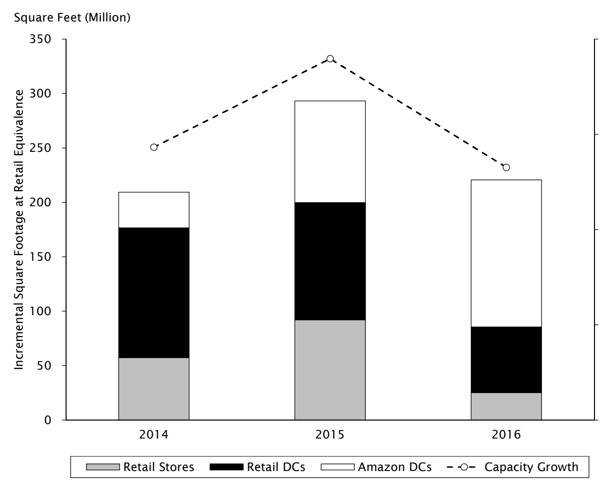
# In Balance on Balance

### *The Opposite of Retail*

The balance of supply and demand is a tenuous one for many industries across the consumer landscape. Demand is generally good with real spending growth tracking in line with its historical average. Supply has been the wildcard. We see this most clearly in the retail industry where Amazon has added enormous capacity in the form of extended opening hours, mobile ordering, nearly infinite inventory availability and 100 million square feet of distribution capacity in the U.S. alone. In response, retailers have fought fire with fire, unwittingly adding even more capacity in the form of inventory and distribution assets. By our count, industry capacity effectively grew by +7% in 2015 and +5% in 2016 despite the fact that retailers were aiming for minimal growth with their physical stores (see Exhibit 1).

A similar dynamic is confronting the media industry, though it is arguably tougher to quantify. Exhibit 2 uses off-balance sheet content commitments as a proxy for capacity, indicating supply growth north of +5% in the most recent year. This is probably understated due to limited disclosure from the likes of Hulu, Amazon and Google's YouTube division. People might be buying more stuff and watching more TV, but it still won't be easy for either of these two industries to improve margins when supply is outstripping demand.

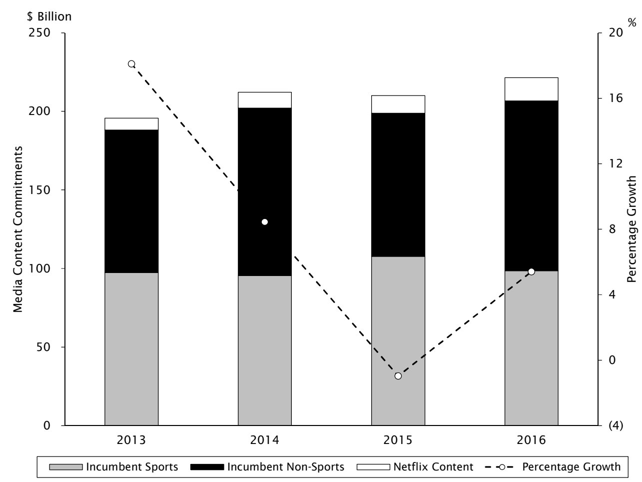
**Exhibit 1: Retail Effective Capacity Growth[1]**
**Incremental Retail and Distribution Square Footage at Retail Equivalence[2]**
**2014 Through 2016**




Source: Empirical Research Partners Analysis.

[1] Retailers include: WMT, TGT, ROST, DG, ORLY, DLTR, BBY, ULTA, AZO, LB, TIF, GPS, AAP, M, KSS, TSCO, FL.
[2] Distribution square footage multiplied by 5 to arrive at retail equivalence.

**Exhibit 2: Media Effective Capacity Growth**
**Content Commitments for Incumbents and Netflix[1]**
**2013 Through 2016**



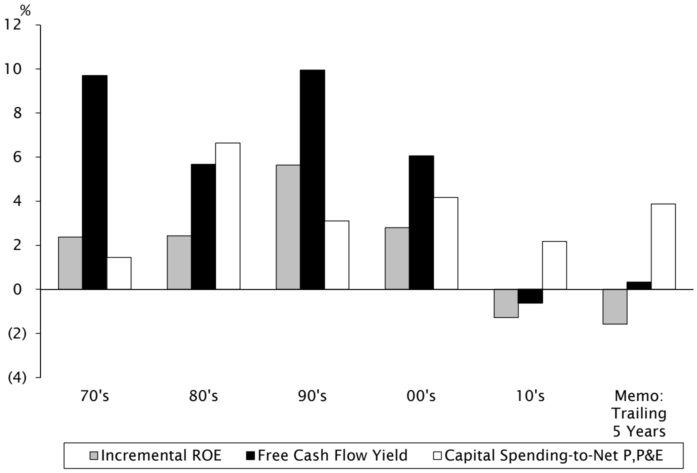

Source: Corporate Reports, Empirical Research Partners.

[1] Incumbents include: NBCUniversal, FOX, CBS, TWX, DIS.

When it comes to stock selection, we can ascertain the rising importance of analyzing capacity growth, or supply, by studying capital spending growth. Prudent capital spending has been a key determinant of stock performance even as other important fundamental and valuation factors have taken a back seat as of late (see Exhibit 3). Broadly speaking, Empirical's capital deployment super factor would have been a useful tool for investors in consumer stocks over the long haul (see Exhibit 4). This factor has become even more pronounced for stocks in the household durables domain, which is the focus of this report.

In many ways, the housing market is the polar opposite of its peers in retail and media. Barriers to entry, which are falling elsewhere, are rising in housing. Stricter zoning laws, environment regulations, the politics of "NIMBY" and rising land prices have for some time been limiting the supply of homes. Lending standards have also played a role by judiciously limiting the availability of credit, effectively keeping a lid on capacity growth. While other consumer sectors are fighting to protect market share in the face of fragmentation, the top-ten publicly traded builders have seen their market share increase from 24% to over 27% over the past five years (see Exhibit 5). That gain has been realized with reduced capital intensity.

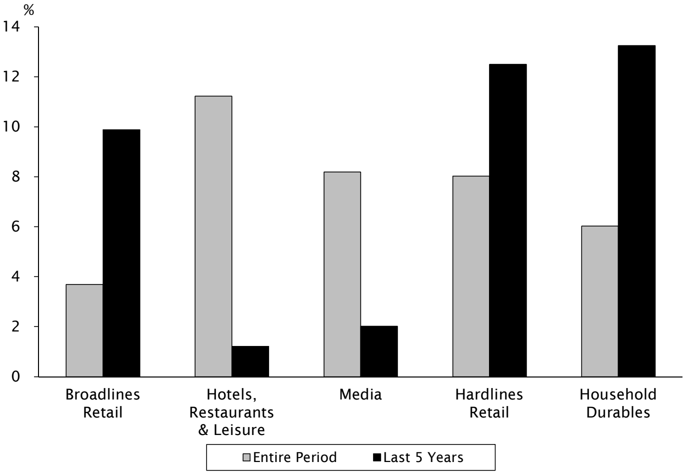
**Exhibit 3: Consumer Stocks Valuation and Fundamental Efficacy**
**Best-Worst Quintile Return Spread by Decade[1]**
**Measured Over One-Year Holding Periods**
**1970 Through August 2017**




Source: Empirical Research Partners Analysis.

[1] Equally-weighted data.; drawn from the largest 1,500 stocks.

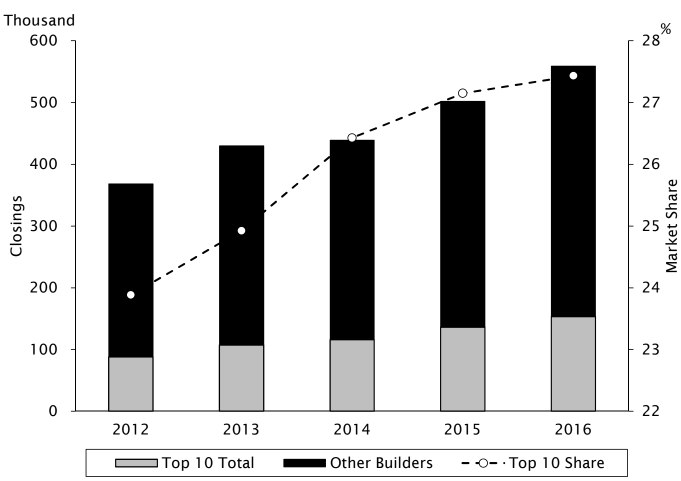
**Exhibit 4: U.S. Consumer Stocks**
**Best-Worst Quintile Return Spread of Capital Deployment by Industry[1]**
**Measured Over One-Year Holding Periods**
**1952 Through August 2017**




Source: Empirical Research Partners Analysis.

[1] Equally-weighted data.; drawn from the largest 1,500 stocks.

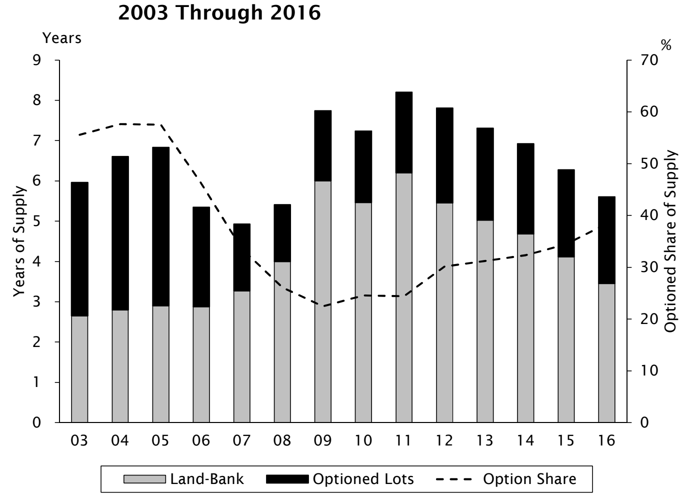
**Exhibit 5: Top 10 Listed Homebuilders[1]**
**Market Share of Total U.S. Closings**
**2012 Through 2016**




Source: National Association of Homebuilders, Corporate Reports, Census Bureau, Empirical Research Partners Analysis and Estimates.

[1] List includes: DRI, PHM, LEN, NVR, KBH, HOV, RYL, BZH, MTH, MDC.

**Exhibit 6: U.S. Homebuilders[1]**
**Years of Supply Controlled with Owned Land and Options[2]**
**2003 Through 2016**




Source: Corporate Reports, Factset, Empirical Research Partners Analysis and Estimates.

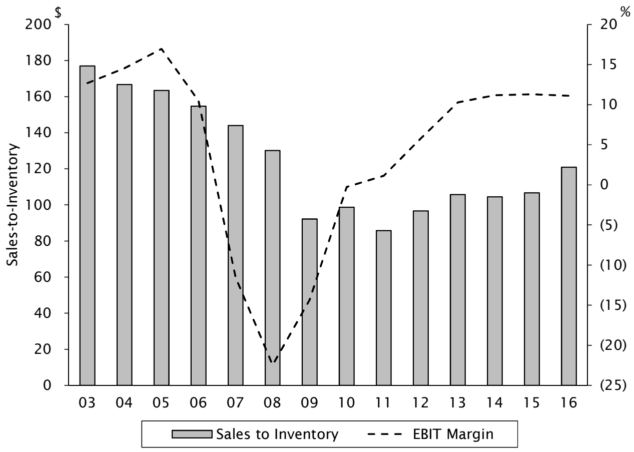
[1] Companies include: DHI, NVR, TOL, LEN, PHM, BZH, KBH, CAA.
[2] Years of supply measured relative to deliveries.

### *More with Less*

Listed builders have actually improved inventory turnover and shrunk supply on-hand by a third from over 8 years in 2011 to 5.5 years in 2016. The amount of capital tied up in land has fallen even more – by nearly (50)% -- as builders have increasingly embraced a more asset-light approach to securing land via options (see Exhibit 6). The numbers now resemble those of the mid-2000's when starts were 50% above the current level. An ability to gain market share with reduced capital deployed is rare in the consumer realm and it has augured well for margins. Builders are essentially doing more with less (see Exhibit 7). Some other consumer sectors such as retail and media seem to be doing less with more.

The broader housing industry is experiencing a similar halcyon. The combination of new and used homes currently on the market is only enough to satisfy 4.5 months of demand (see Exhibit 8). That is one of the lowest levels on record, and it would be lower still if the pace of sales were to reflect the deep well of pent-up demand that is beginning to surface. The current pace of 960,000 new households per annum may have bounced off the bottom, but it still falls short of the 1.2 million average that the U.S. seen over the past 50 years (see Exhibit 9).

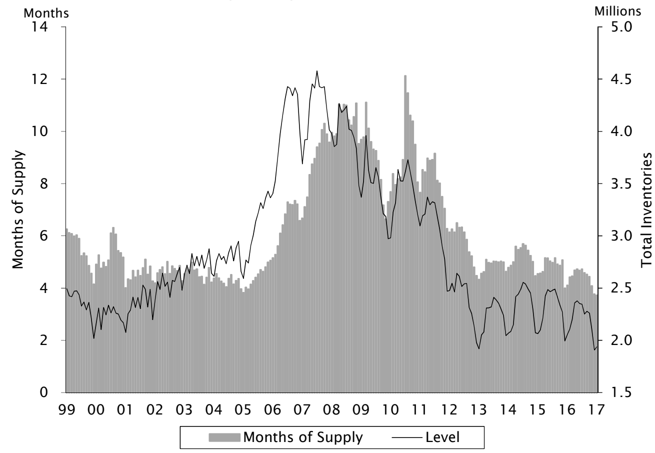
**Exhibit 7: U.S. Homebuilders[1]**
**Inventory Productivity and EBIT Margins**
**2003 Through 2016**




Source: Corporate Reports, Factset, Empirical Research Partners Analysis and Estimates.

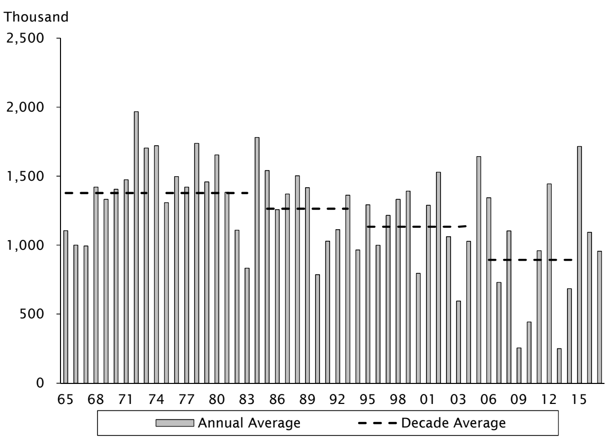
[1] Companies include: DHI, NVR, TOL, LEN, PHM, BZH, KBH, CAA.

**Exhibit 8: New and Existing Home Inventories**
**Level and Months of Supply**
**1999 Through August 2017**



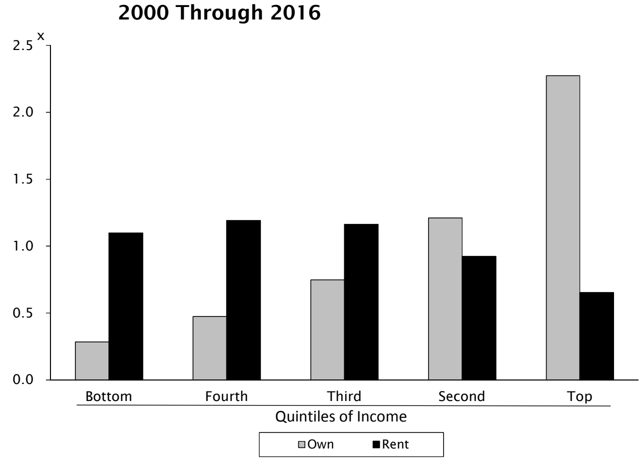

Source: U.S. Census Bureau, National Association of Realtors, Empirical Research Partners Analysis.

**Exhibit 9: U.S. Household Formation**
**Averages by Year and Decade**
**1965 Through Q2 2017**




Source: Census Bureau, Empirical Research Partners Analysis.

**Exhibit 10: Homeownership and Rentership**
**Average Annual Spending on Owned and Rented Dwellings Relative to All Households**
**by Income Quintile**
**2000 Through 2016**

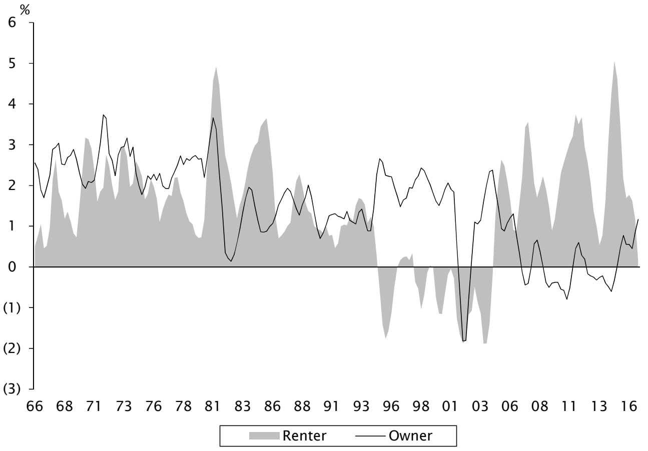



Source: Bureau of Labor Statistics, Empirical Research Partners Analysis.

In an expanding economy, homeownership has historically been an aspirational good. Rent on the other hand, has historically acted like a regressive good. Exhibit 10 highlights the degree to which lower-income households over-index to rent. Homeownership grows monotonically as incomes rise, a relationship we expect to persist. Recent progress is evident from Exhibit 11, which shows the quarterly growth in households from the Census Bureau. After years of under-punching their weight, owner households have recently begun to outpace the growth in renter households. The data also indicate that families with incomes below the median are beginning to participate more equitably (see Exhibit 12). This is consistent with our work on the consumer, which finds that wage and aggregate income growth are beginning to favor those in the middle of the economic pyramid.

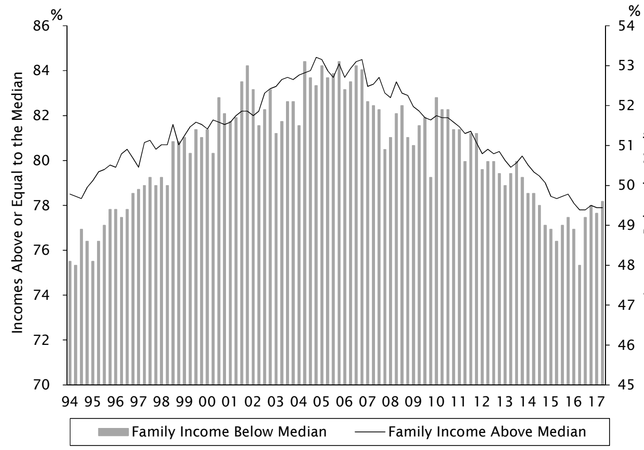
The age profile of the housing market is also favorable, though it has not felt that way in recent years. Millennials, which are well represented in the 25-34 year-old cohort, should technically more than offset Boomer's reduced needs as that group turns 65-74 (see Exhibit 13). That has not been the case so far. In fact, young adults have accounted for a disproportionate share of the homeownership deficit. The gap may be starting to narrow (see Exhibit 14). When it comes to household formation, the 35-44 year old group has made small strides in each of the past two years (see Exhibit 15). Their younger 25-34 year-old peers have yet to make progress in part due to a later marrying age. This trend has intensified with the median age to marry rising by 2 months per year over the past decade compared with a gain of only 1 month per year in the preceding 20 years (see Exhibits 16). This is a surmountable factor. Ultimately, the pace of progress will depend on three factors – attitudes, employment and affordability.

**Exhibit 11: Owner and Renter Households**
**Year-Over-Year Growth**
**1966 Through Q2 2017**



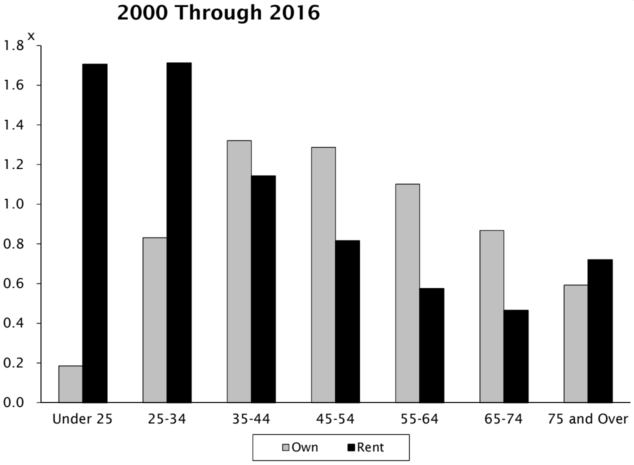

Source: Census Bureau, Empirical Research Partners Analysis.

**Exhibit 12: Homeownership Rate by Family Income**
**1994 Through Q2 2017**



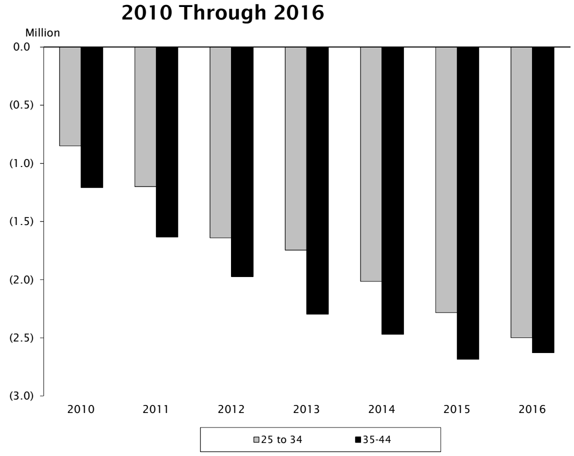

Source: Census Bureau, Empirical Research Partners Analysis.

**Exhibit 13: Homeownership and Rentership**
**Average Annual Spending on Owned and Rented Dwellings Relative to All Households by Age Cohort**
**2000 Through 2016**



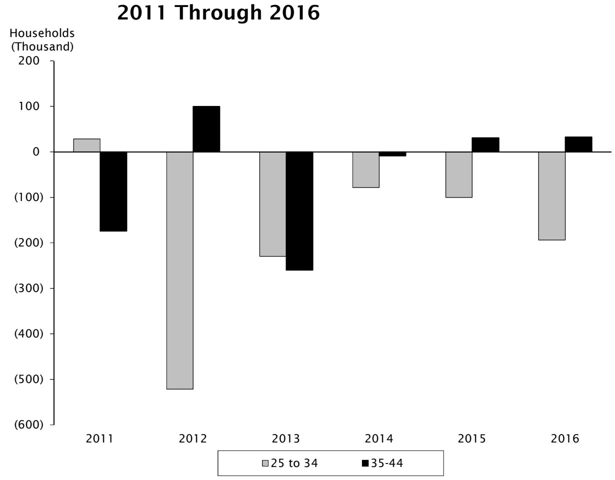

Source: Bureau of Labor Statistics, Empirical Research Partners Analysis.

**Exhibit 14: Pent-Up Demand**
**Cumulative Household Formation by 25-44 Year-Olds Versus Expected[1]**
**2010 Through 2016**




Source: Census Bureau, Empirical Research Partners Analysis.
[1] Expected gap based on holding homeowner-to-population constant by age cohort from pre-recession levels (1998 - 2007).

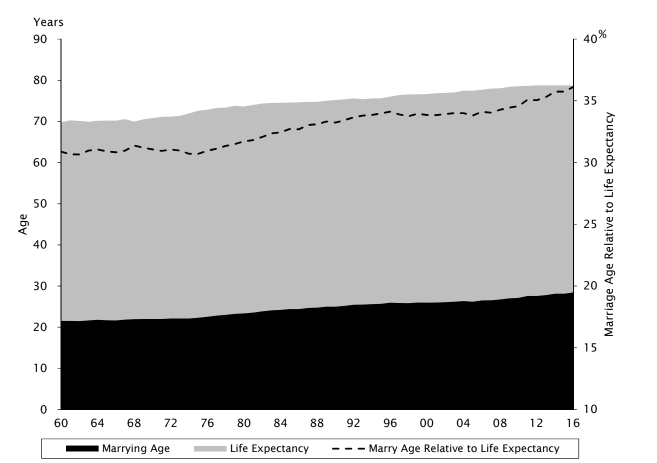
**Exhibit 15: Pent-up Demand for Household Formation by Age Cohort**
**Change in Cumulative Gap Between Observed and Expected Households[1]**
**2011 Through 2016**




Source: Census Bureau, Empirical Research Partners Analysis.

[1] Expected headship based on 10-year average prior to the recession.

**Exhibit 16: Age of First Marriage**
**Median Marriage Age Relative to Life Expectancy**
**1960 Through 2016**



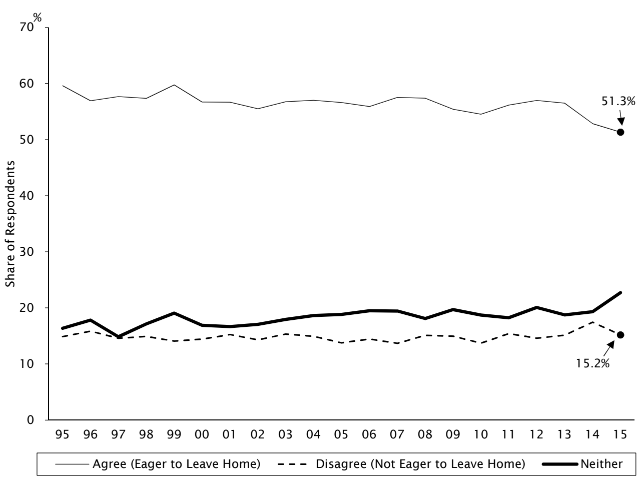

Source: Census Bureau, World Bank, Empirical Research Partners Analysis and Estimates.

### *Attitudes, Employment and Home Prices*

As it relates to attitudes, many have questioned whether today's young adults value the American Dream of home-ownership anywhere near as dearly as their predecessors did. Some have postulated that living at home (with their parents) is simply the new normal. According to an annual University of Michigan study, high-school seniors have become more accepting of living in their parent's home for longer, but more than half of all respondents are still eager to live on their own (see Exhibit 17). This compares with only 15% that are eager to remain in their parent's home.

The media can be quick to label Millennials, but generational characteristics often need to be taken with a grain of salt, especially when they are skewed by cyclical factors. Exhibit 18 breaks down the employment status of 18-34 year-old men that live in their parent's home. Fully half of the unemployed segment of this cohort lives with parents. Aside from a one-decade dip, this reading seems to be consistent with its long history. The tendency to live with parents shrinks dramatically when we look at 18-34 year-olds with jobs. Young adults that are gainfully employed are 40% less likely to live with parents. Importantly, the employment-to-population ratio for young adults is beginning to improve and household formation should follow suit. This in turn, should also bode well for home-ownership.

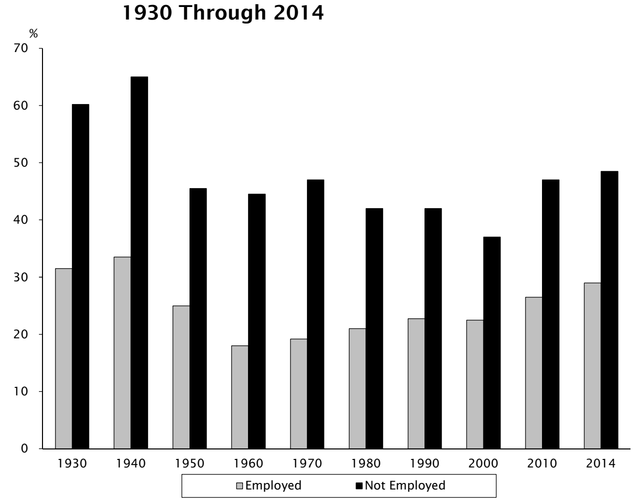
**Exhibit 17: Attitude of Young Adults Towards Living with Parents**
**Share of Responses by High-School Seniors[1]**
**1995 Through 2015**




Source: University of Michigan, Empirical Research Partners Analysis.

[1] Response to the question: "I am eager to leave home and live on my own—independent from my parents."

**Exhibit 18: Young Adults Living with Parents**
**Share of Employed and Unemployed 18-34 Year-Old Men Living in Parent's Home**
**1930 Through 2014**



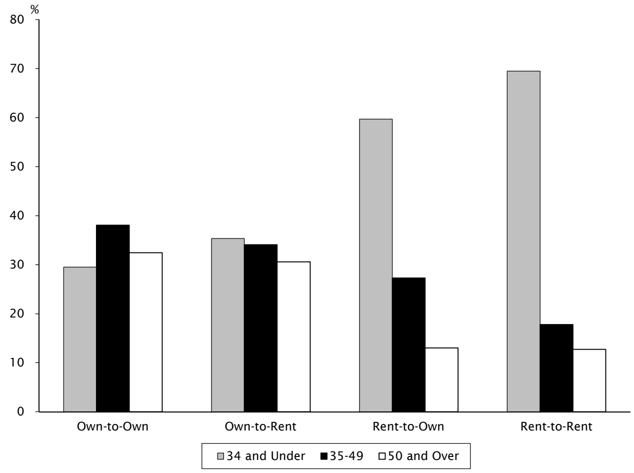

Source: Pew Research Center, Census Bureau, Empirical Research Partners Analysis.

According to research from the Boston Federal Reserve Bank, households headed by those under 34 years of age account for 70% of the movement inside the rental market and 60% of the movement from rentership to ownership (see Exhibit 19). In other words, they are a critical factor in understanding the logjam that is homeownership. Their choice to own or rent says a lot about the broader economy as well. Movement into and within the rental market is counter-cyclical with low or inverse correlations with overall consumption and housing prices. Movement into and within the ownership market is pro-cyclical. It has exhibited a 70% correlation with consumption over a 40 year-year period of time and a 60% correlation with changes in home prices (see Exhibit 20). Greater demand tends to lead home prices, but too much demand might turn into a problem if home prices follow suit.

### *Too Much of a Good Thing?*

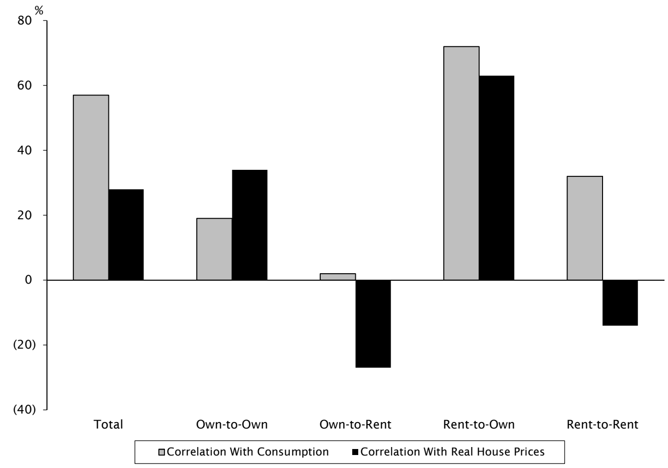
At the top of this report, we noted that many areas of the consumer economy are in states of over-supply. The housing market is at the opposite end of the spectrum. Over the past six months houses have been staying on the market for only 65 days. This is down from 78 days for all of 2016 and 82 days for 2015 (see Exhibit 21). Not surprisingly, this has created upward pricing pressure. The pressure has been greatest at the low-end of the market for the past two years, reversing a long-standing trend favoring bigger and higher-end homes (see Exhibit 22). This is consistent with a dynamic that has followed Boomers all their lives. Specifically, when big segments of the population look to do the same thing at the same time, the proverbial python has a tough time digesting the pig. The same phenomenon might be haunting Millennials as they move into a tight entry-level housing market.

**Exhibit 19: Housing Turnover**
**Composition of Movement by Age Cohort**
**1970 Through 2009**




Source: Bachmann, R. and Daniel Cooper, 2014. "The Ins and Arounds in the U.S. Housing Market," Working Paper, Empirical Research Partners Analysis.

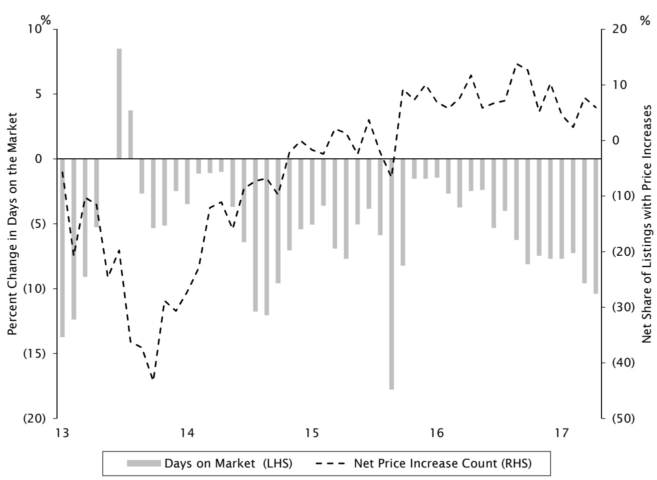
**Exhibit 20: Housing Turnover**
**Correlation With Consumption and Real House Prices**
**by Type of Turnover**[1]
**1970 Through 2009**




Source: Bachmann, R. and Daniel Cooper, 2014. "The Ins and Arounds in the U.S. Housing Market," Working Paper, Empirical Research Partners Analysis.

[1] One-year lead.

**Exhibit 21: Housing Inventory Situation**
**Year-Over-Year Change in Days on the Market**
**and Price Performance**[1]
**2013 Through September 2017**




Source: National Association of Realtors, Empirical Research Partners Analysis.

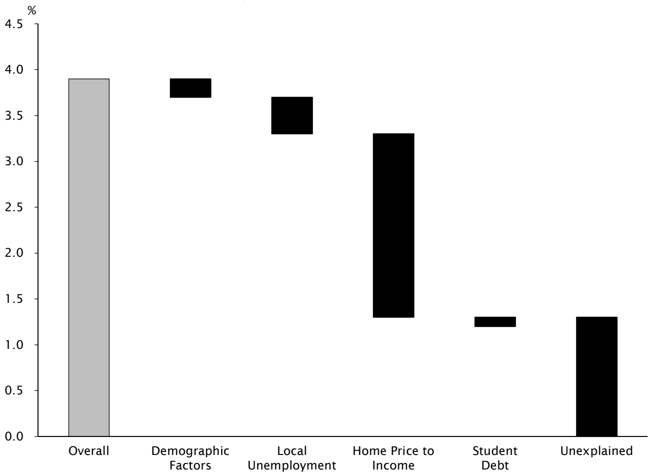
[1] Price performance reflects the dispersion of inventory with price increases relative to decreases.

**Exhibit 22: Median Home Values by Tier**
**Year-Over-Year Change for Median, Bottom**
**and Top Tier Single-Family Homes**
**1997 Through August 2017**


Source: Zillow, Empirical Research Partners Analysis.

A separate study from the Boston Fed posits that housing affordability is likely to limit turnover. Their research suggests that affordability is by far the biggest determinant in whether or not young adults flee the nest (see Exhibit 23). First-time buyer affordability has already begun to fall as a result of higher prices and rising mortgage rates (see Exhibit 24). The math behind the National Association of Realtor's calculation assumes a 10% down payment for a starter home with mortgage interest factored in at the prevailing rate. The estimate at the far right of Exhibit 25 depicts the added burden a 50 basis-point increase in mortgage rates would have on affordability holding other variables constant. This alone would cost potential homeowners an additional 1.5% of income relative to renting. Rising mortgage rates off an exceptionally-low base have been a looming threat for years, but only recently following years of price increases have they begun to weigh on the home buying decision (see Exhibit 26).

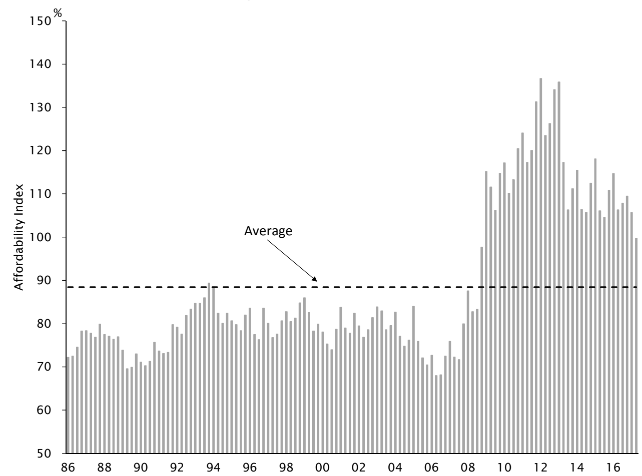
**Exhibit 23: Young Adults Living With Parents[1]**
**Factors Explaining Change in Living Arrangement**
**1997 Through 2013**




Source: Cooper, D., and Maria Jose Luego-Prado, "Household Formation over Time: Evidence from Two Cohorts of Young Adults", 2017, Boston Fed, Longitudinal Survey of Youth, Empirical Research Partners Analysis.

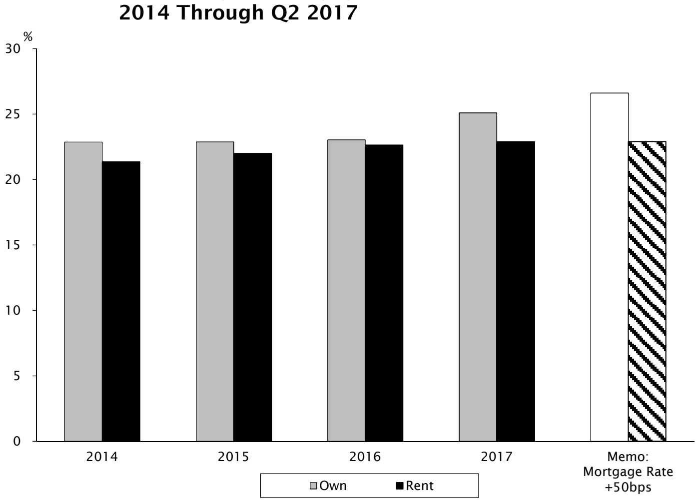
[1] 23-33 year olds in 1997 cohort compared to 1979 cohort.

**Exhibit 24: Housing Affordability for First-Time Buyers**
**Index Level and Historical Average**
**1986 Through Q2 2017**




Source: National Association of Realtors, Empirical Research Partners Analysis.

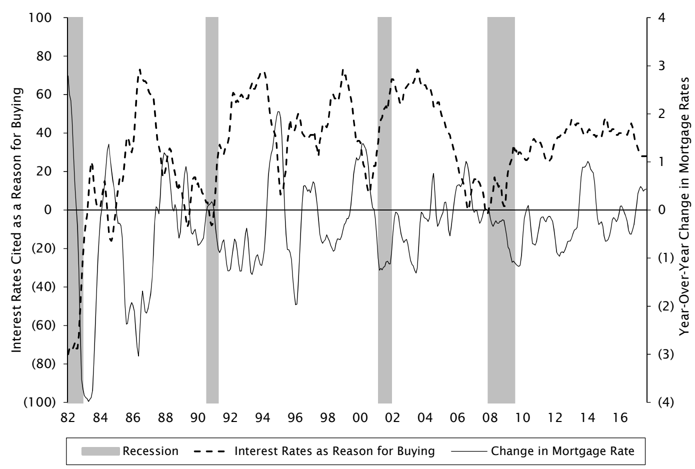
**Exhibit 25: Cost of Homeownership and Renting[1]**
**Share of First-Time Buyer Income**
**Depending on Mortgage Rates**
**2014 Through Q2 2017**




Source: National Association of Realtors, Federal Housing Administration, Empirical Research Partners Analysis and Estimates.

[1] Cost of homeownership reflects 10% down payment and includes insurance.

**Exhibit 26: Home Buying and Mortgage Rates**
**Interest Rates Cited as Reason for Home Buying**
**and the Change in 30-Year Mortgage Rates[1,2]**
**1982 Through September 2017**




Source: University of Michigan, St. Louis Fed, NBER, Empirical Research Partners Analysis.

[1] Net respondents indicating interest rates as a reason for buying a home.
[2] Smoothed three months.

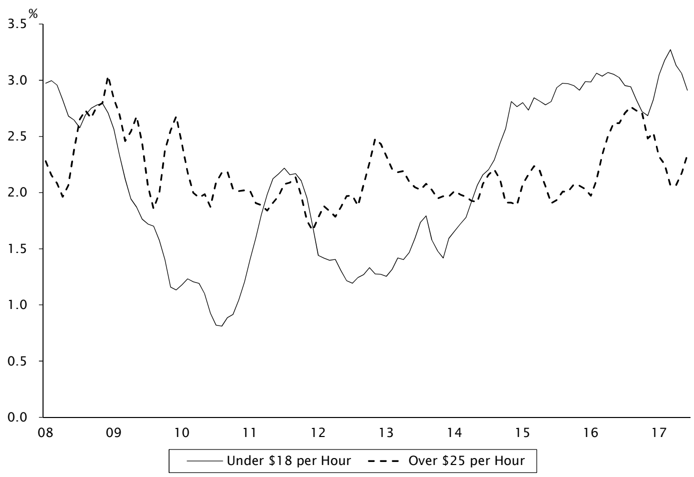
## *No Clear and Present Danger*

We are relatively sanguine about the outlook for housing in part because we expect the income dynamic for the middle of the economic pyramid to remain constructive. Using the NAR's framework, it would take a +6% increase in median incomes to offset a 50 basis point uptick in mortgage rates. Our calculations show that workers making less than $18 per hour have seen wages rise faster than average and data from the San Francisco Fed show that wages for people that have continuously been in the full-time workforce for longer than one-year are seeing wages rise close to +5% (see Exhibits 27 and 28). If this continues, it could help support affordability even in the face of rising mortgage rates.

According to the Federal Reserve's recently-issued Survey on Consumer Finances, renters have seen their debt load fall and their equity rise (see Exhibit 29). Digging deeper, we can see that renters under the age of 35 have rebuilt their discretionary financial asset base to exceed prior peaks. On average, these liquid assets amount to 25% of a starter home price (see Exhibit 30).

It is possible that the current balance of supply and demand for homes ends up being too much of a good thing, but with favorable income dynamics and so much pent-up demand in the system we do not see that as a clear and present danger.

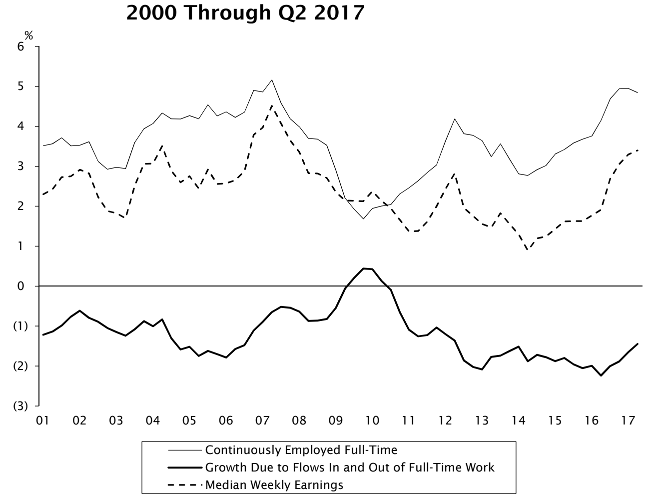
**Exhibit 27: Wage Growth[1]**
**Hourly Wage Growth for Workers Earning Less Than $18 and More Than $25 Per Hour**
**2008 Through August 2017**




Source: Bureau of Labor Statistics, Empirical Research Partners Analysis.

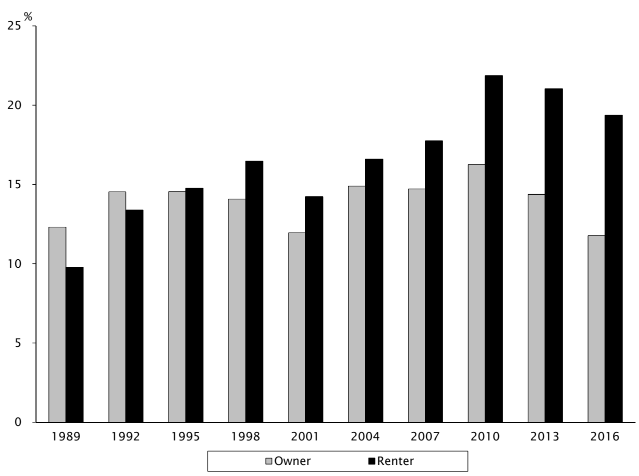
[1] Data smoothed on a trailing 3-month basis.

**Exhibit 28: Median Wage Growth**
**Contribution from Continuously Employed Full-Timers and from Flows Into and Out of Full-Time Work**
**2000 Through Q2 2017**




Source: San Francisco Fed, Empirical Research Partners Analysis.

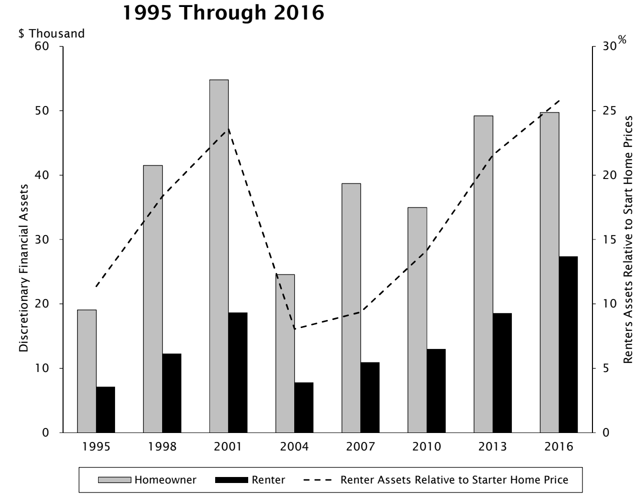
**Exhibit 29: Leverage Ratio by Housing Status[1]**
**Owners Versus Renters**
**1989 Through 2016**




Source: Survey of Consumer Finances, Federal Reserve, Empirical Research Partners Analysis.

[1] Debt as a share of assets.

**Exhibit 30: Households Headed by Those Under 35**
**Discretionary Financial Assets for Homeowners and Renters and Relative to Starter Home Prices[1]**
**1995 Through 2016**




Source: Survey of Consumer Finances, Empirical Research Partners Analysis.

[1] Assets exclude pension and cash value of life insurance.

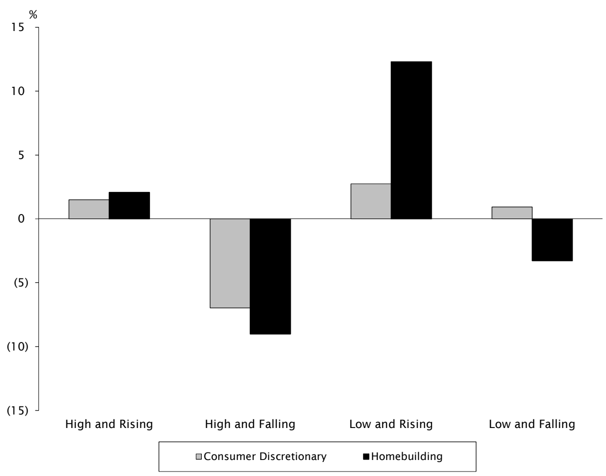
### *Fundamentals Should Drive Performance*

The challenge for investors is to capitalize on these favorable trends without over-staying their welcome. No one wants to be the last one in the pool, especially when memories of the housing crash are still fresh. As is often the case, a historical perspective might help guide the investment decision. Since 1974 homebuilders as a group have fared best when mortgage rates are low and rising (see Exhibit 31). They have fared worse when mortgage rates were falling. This is intuitive to us since falling rates can signal weaker demand ahead. The only concerning scenario seems to be when rates are falling from high levels, but that is not likely to arise in the near future. Perhaps it is best not to overstate the role of mortgage rates. The same is true of housing supply dynamics. The group's best and worst months of performance don't seem to depend on these factors (see Exhibit 32).

Exhibit 33 makes the point in a different way by depicting the correlation of large-capitalization homebuilder stocks to the total return of the 10-year Treasury bond over 35-year period. Correlations have dipped into negative territory, indicating that the group has become an anti-bond proxy as of late. This is also not bothersome to us at this point of the cycle. Our best advice is to forge ahead and follow the fundamentals with a particular focus on three factors: controversy as measured by arbitrage risk, capital deployment and valuation (see Exhibit 34). These have been the best guide for stock selection over both the long and shorter-term.

We provide a list of housing-related stocks that have high ROEs, attractive valuations and deploy capital mindfully in Appendix 1 on page 14.

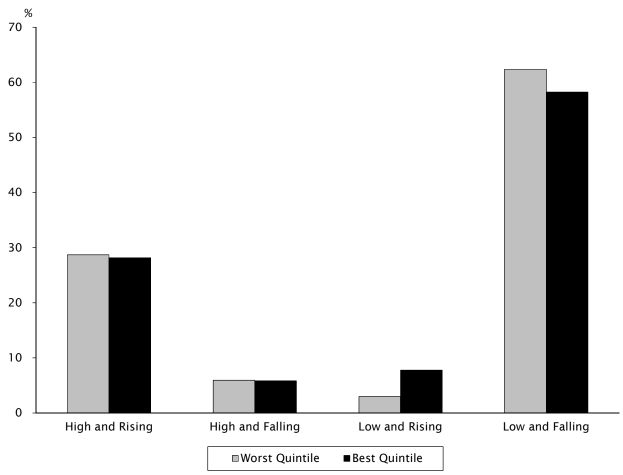
**Exhibit 31: Large-Capitalization Homebuilder Stocks Forward 12-Month Relative Return Depending on Mortgage Rate Dynamic[1] Measured Over One-Year Holding Periods 1974 Through September 2017**




Source: Empirical Research Partners Analysis.

[1] Level of rates compare 30-year mortgage on a trailing three-month average to trailing three-year average.

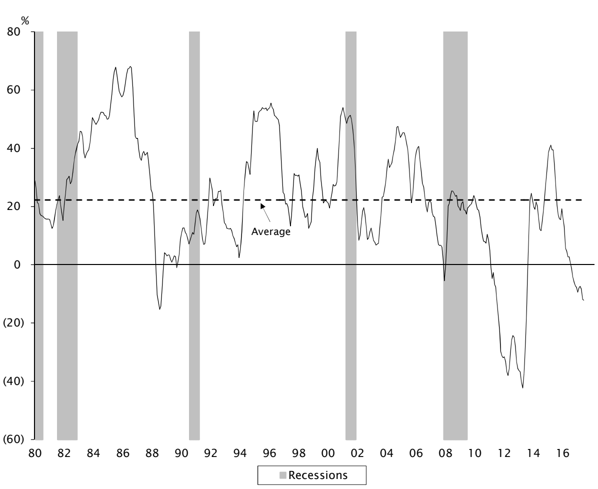
**Exhibit 32: Large-Capitalization Homebuilder Stocks Share of Months in the Best and Worst Quintiles of Forward 12-Month Relative Returns Dependent on the Mortgage Rate Dynamic[1] Measured Over One-Year Holding Periods 1974 Through September 2017**




Source: Empirical Research Partners Analysis.

[1] Level of rates compares trailing three month average to trailing three year average.

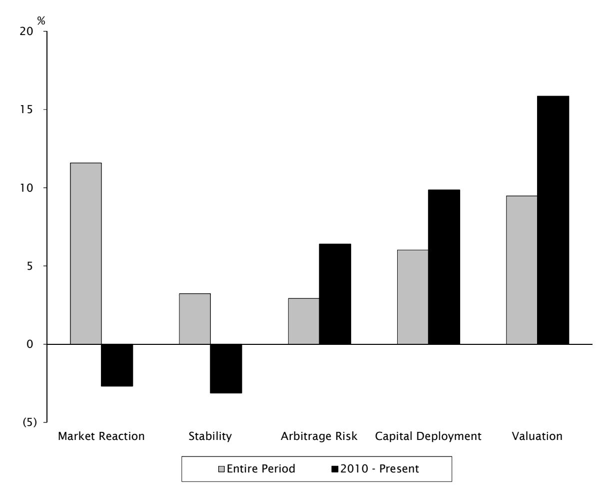
**Exhibit 33: Large-Capitalization Homebuilder Stocks Correlation of Relative Returns with the Total Return of Treasury Bonds[1] 1980 Through September 2017**




Source: National Bureau of Economic Research, Ibbotson Associates, Bloomberg LP, Empirical Research Partners Analysis.

[1] Constructed using trailing two-year data; smoothed on a trailing three-month basis. Returns are capitalization weighted.

**Exhibit 34: Household Durables[1] Relative Returns to Various Factors by Decade Measured Over One-Year Holding Periods 1952 Through August 2017**

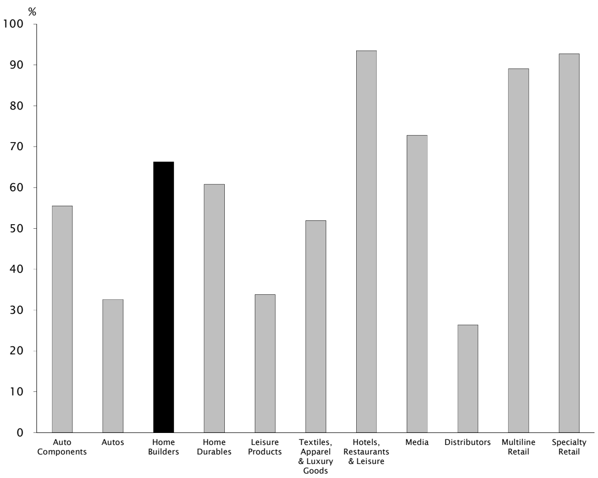



Source: Empirical Research Partners Analysis.

[1] Equally weighted data. Drawn from the largest 1,500 stocks.

When it comes to valuation, we do not think price-to-book is the best gauge. Strategies are increasingly centered on optioned land as opposed to owned land. This should reduce the amount of capital at-risk and the resulting book value of these businesses. NVR is a case in point. It has been the industry's most consistent outperformer and the greatest proponent of an options-based acquisition strategy. Other methods of valuation are more telling. Builders look to be relatively cheap on free cash flow, at least compared to other industries (see Exhibit 35). The only cheaper sectors are retail and media, which are battling disruption. The builders are not. Builders also have experienced P/E compression, leaving them at a discount to the market even despite increased financial stability (see Exhibits 36 and 37). With ROEs improving and strong demand, the market is pricing the stocks to reflect unremarkable growth prospects. This might be a conservative set of expectations (see Exhibit 38).

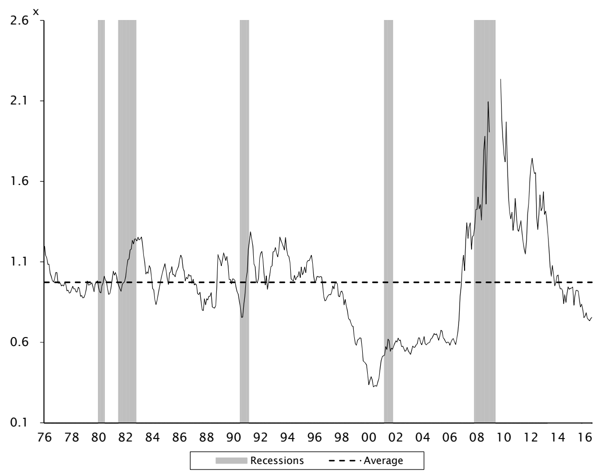
**Exhibit 35: U.S. Consumer Discretionary Stocks Relative Free Cash Flow Yields by Industry Percentile Rank (100=Cheapest)[1] 1983 Through September 2017**




Source: Corporate Reports, Empirical Research Partners Analysis.

[1] Capitalization-weighted data.

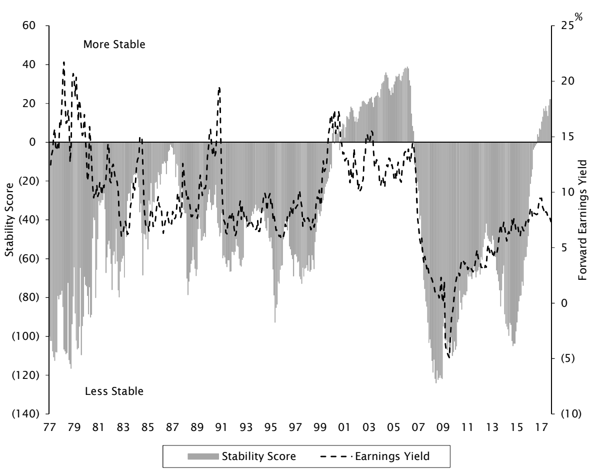
**Exhibit 36: Homebuilders and Other Housing-Related Stocks Relative Forward-P/E Ratios[1] 1976 Through October 2017**




Source: Corporate Reports, Empirical Research Partners Analysis.

[1] Drawn from the large-capitalization universe; capitalization-weighted data. Includes homebuilders, building products and home furnishings.

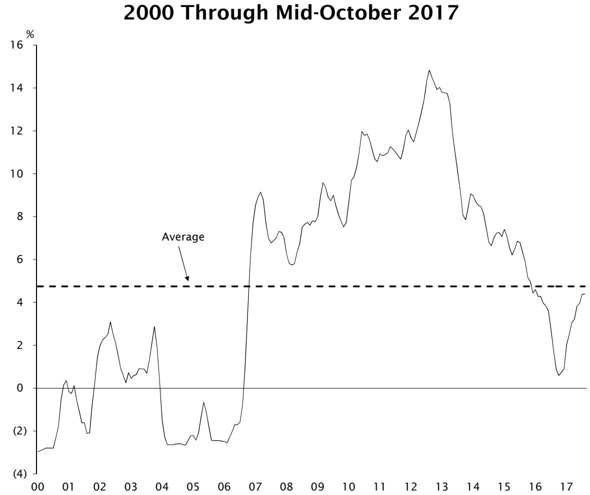
**Exhibit 37: Large-Capitalization Homebuilder Stocks[1] Earnings Stability Score and Forward Earnings Yield 1977 Through Early-October 2017**




Source: Empirical Research Partners Analysis.

[1] Equal-weighted data.

**Exhibit 38: U.S. Large-Capitalization Homebuilder Stocks Five-Year Forward Implied Earnings Growth Rates[1] 2000 Through Mid-October 2017**



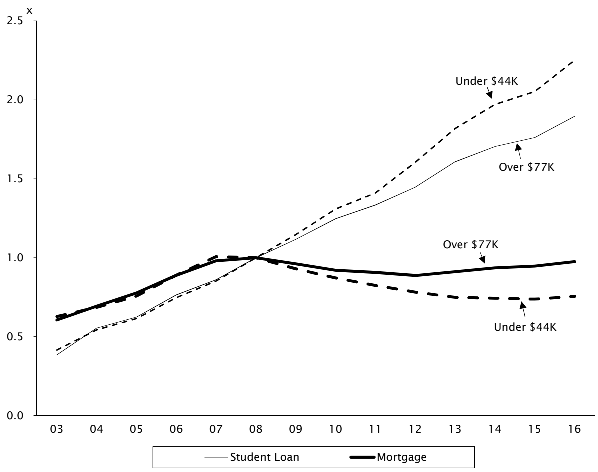

Source: Corporate Reports, Empirical Research Partners Analysis.

[1] Equally-weighted data.

### *What About Student Debt?*

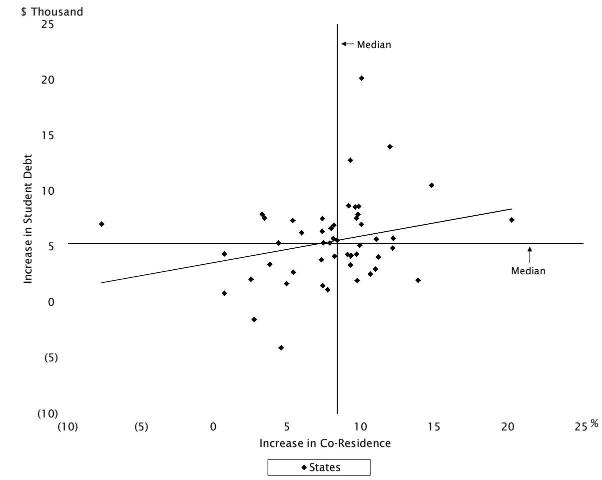
The topic of student debt has been widely researched in the academic realm, but it gets less attention in investment research since investment implications can be limited. The $1.4 trillion "elephant in the room" however, cannot be ignored in the context of a broader housing discussion. That is especially true given the important role young adults are expected to play. According to the New York Fed, student debt and mortgage debt have traded places since the recession ended. Mortgage debt has fallen relative to its peak while student debt has surged. The trend is even more pronounced for lower income borrowers (see Exhibit 39). While research from the Boston Fed found little linkage between student debt and delayed household formation, Exhibit 40 evidenced a small positive relationship between the two. The graph shows the increase in average student per graduate plotted against the percentage increase in parental co-residence by state.

**Exhibit 39: Student Debt and Mortgage Debt Balance Relative to Peak by Income Cohort 2003 Through 2016**




Source: NY Fed/Equifax, Empirical Research Partners Analysis.

**Exhibit 40: Parental Co-Residence and Student Debt by State[1,2] Change in Average Student Debt Per Graduate and Incidence of Parental Co-Residence 2013 Versus 2008**

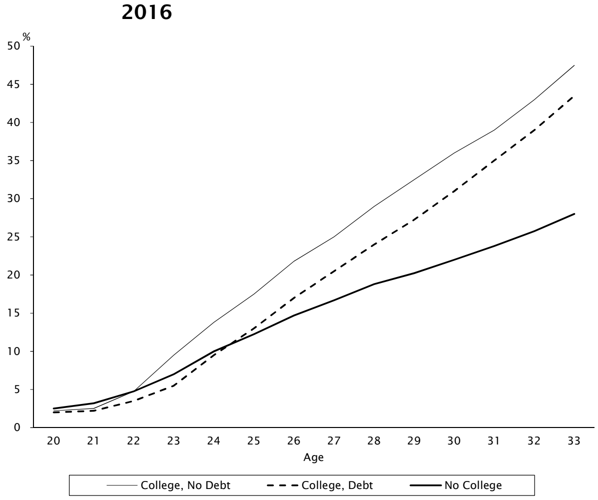



Source: NY Fed/Equifax, Empirical Research Partners Analysis.

[1] Increase in average student debt per graduate.
[2] Increase in parental co-residence for 25 year-olds.

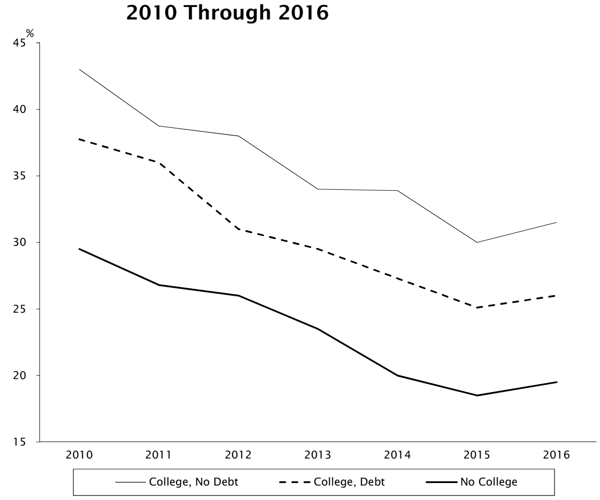
Despite the adverse impacts of student debt, it may still be better than the alternative – no college. Exhibit 41 plots homeownership rates by age of borrower. The best condition for homeownership is to have a college education with no student debt. The presence of student debt delays homeownership early on, but eventually weighs only modestly on the homeownership rate. Having student debt is – as they say – better than the alternative. Those without a college education are far less likely to own homes with or without student debt.

**Exhibit 41: Homeownership Rate and Student Debt College Attendance and Student Debt Status 2016**




Source: NY Fed/Equifax, National Student Clearninghouse, Empirical. Research Partners Analysis

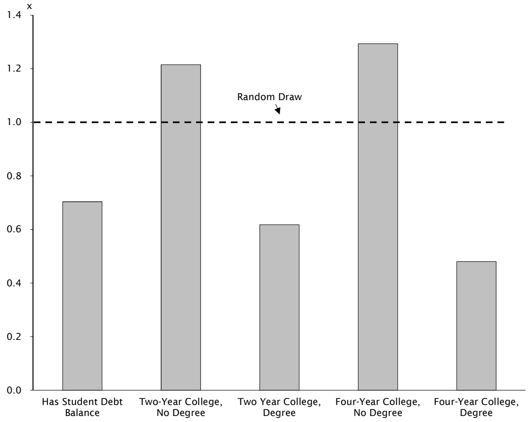
**Exhibit 42: Homeownership Rate by Age 30 College Attendance and Student Debt Status 2010 Through 2016**




Source: NY Fed/Equifax, National Student Clearinghouse, Empirical Research Partners Analysis.

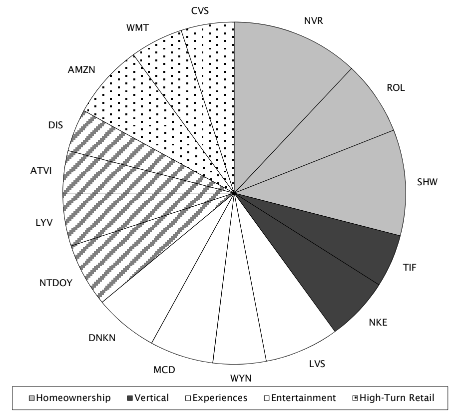
This relationships have held steady over time. We can see that homeownership rates fell for each of these three cohorts since 2010, but surprisingly, the decline has been ratable (see Exhibit 42). The presence of student debt is not as important as whether or not the student actually graduates. The old adage "stay in school" rings true. Researchers at Dartmouth College have determined that when it comes to kids that "boomerang" back into their parent's home, graduation rates matter more than the presence of student debt (see Exhibit 43).

**Exhibit 43: Boomeranging**
**Factors Determining Whether College Students Return Home**
**Incidence of Return Indexed to Sample Size**
**1997 Through 2013**




Source: Warner, C., Jason Houle, 2017. "Into the Red and Back to the Nest?: Student Debt, College Completion and Returning to the Parental Home among Young Adults", Empirical Research Partners Analysis.

**Exhibit 44: Consumer Lens Portfolio**
**Weighting by Theme**
**As of Late-August 2017**




Source: Empirical Research Partners Analysis.

**Appendix 1: Consumer Durables (ex-Autos) and Other Housing-Related Stocks**
**Ranked by Valuation, Capital Deployment and Return on Equity**
**Sorted by the Average of the Three Factors**
**As of Mid-October 2017**

| | | | Quintile Ranks (1=Best; 5=Worst) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Symbol | Company | Price | Valuation Super Factor | Capital Deployment Super Factor | Return on Equity | **Average of the Three** | Forward P/E-Ratio | YTD Returns | Market Capitalization ($ Million) |
| LOW | LOWE'S COMPANIES INC | $81.21 | 1 | 1 | 1 | **1.0** | 15.1 x | 15.8 % | $67,964 |
| WHR | WHIRLPOOL CORP | 176.77 | 1 | 1 | 2 | **1.3** | 11.0 | (1.0) | 12,904 |
| URI | UNITED RENTALS INC | 142.16 | 1 | 3 | 1 | **1.7** | 13.6 | 38.1 | 12,325 |
| PHM | PULTEGROUP INC | 27.11 | 1 | 1 | 3 | **1.7** | 11.4 | 49.1 | 8,233 |
| HD | HOME DEPOT INC | 165.25 | 4 | 1 | 1 | **2.0** | 19.1 | 24.7 | 193,944 |
| NVR | NVR INC | 2,945.56 | 3 | 2 | 1 | **2.0** | 20.1 | 76.5 | 11,040 |
| OC | OWENS CORNING | 79.85 | 2 | 1 | 3 | **2.0** | 16.9 | 55.6 | 8,853 |
| TOL | TOLL BROTHERS INC | 42.76 | 2 | 1 | 3 | **2.0** | 12.3 | 38.8 | 6,929 |
| PII | POLARIS INDUSTRIES INC | 103.45 | 2 | 2 | 2 | **2.0** | 21.0 | 28.1 | 6,472 |
| TPX | TEMPUR SEALY INTL INC | 65.23 | 3 | 2 | 1 | **2.0** | 18.8 | (4.5) | 3,521 |
| NWL | NEWELL BRANDS INC | 42.75 | 2 | 2 | 3 | **2.3** | 13.4 | (3.0) | 20,952 |
| HAS | HASBRO INC | 97.13 | 4 | 2 | 1 | **2.3** | 18.7 | 27.0 | 12,149 |
| CAA | CALATLANTIC GROUP INC | 37.85 | 2 | 2 | 3 | **2.3** | 10.1 | 11.7 | 4,171 |
| TUP | TUPPERWARE BRANDS CORP | 61.58 | 2 | 4 | 1 | **2.3** | 12.5 | 20.8 | 3,133 |
| MAS | MASCO CORP | 38.96 | 4 | 3 | 1 | **2.7** | 18.4 | 24.6 | 12,412 |
| ROL | ROLLINS INC | 47.48 | 5 | 2 | 1 | **2.7** | 52.1 | 42.4 | 10,392 |
| GRMN | GARMIN LTD | 55.15 | 3 | 3 | 2 | **2.7** | 19.5 | 17.1 | 10,372 |
| FBHS | FORTUNE BRANDS HOME & SECUR | 66.06 | 3 | 3 | 2 | **2.7** | 20.2 | 25.1 | 10,211 |
| LII | LENNOX INTERNATIONAL INC | 180.29 | 4 | 3 | 1 | **2.7** | 21.4 | 19.2 | 7,639 |
| TTC | TORO CO | 62.35 | 4 | 3 | 1 | **2.7** | 24.5 | 12.0 | 6,706 |
| LEG | LEGGETT & PLATT INC | 47.79 | 3 | 4 | 1 | **2.7** | 18.4 | (0.1) | 6,323 |
| BC | BRUNSWICK CORP | 57.59 | 3 | 3 | 2 | **2.7** | 13.2 | 6.5 | 5,113 |
| USG | USG CORP | 33.07 | 3 | 2 | 3 | **2.7** | 17.7 | 14.3 | 4,733 |
| AWI | ARMSTRONG WORLD INDUSTRIES | 52.85 | 5 | 2 | 1 | **2.7** | 18.6 | 27.6 | 2,822 |
| AOS | SMITH (A O) CORP | 60.65 | 5 | 2 | 2 | **3.0** | 27.2 | 30.3 | 10,569 |
| ALLE | ALLEGION PLC | 88.15 | 5 | 3 | 1 | **3.0** | 22 | 38.6 | 8,372 |
| MAT | MATTEL INC | 15.75 | 2 | 4 | 3 | **3.0** | 18.1 | (40.5) | 5,398 |
| SHW | SHERWIN-WILLIAMS CO | 383.04 | 5 | 4 | 1 | **3.3** | 23.2 | 44.0 | 35,876 |
| SWK | STANLEY BLACK & DECKER INC | 156.49 | 4 | 4 | 2 | **3.3** | 20.4 | 40.2 | 24,298 |
| DHI | D R HORTON INC | 41.37 | 4 | 4 | 2 | **3.3** | 13.4 | 52.8 | 15,484 |
| LEN | LENNAR CORP | 55.86 | 3 | 4 | 3 | **3.3** | 12.4 | 30.4 | 13,142 |
| HDS | HD SUPPLY HOLDINGS INC | 34.95 | 5 | 4 | 1 | **3.3** | 13.3 | (16.5) | 6,709 |
| HELE | HELEN OF TROY LTD | 95.60 | 2 | 5 | 3 | **3.3** | 18.2 | 13.2 | 2,607 |
| TREX | TREX CO INC | 85.22 | 5 | 4 | 1 | **3.3** | 27.3 | 34.5 | 2,547 |
| UFPI | UNIVERSAL FOREST PRODS INC | 99.04 | 2 | 5 | 3 | **3.3** | 17.5 | (2.2) | 2,031 |
| DOOR | MASONITE INTERNATIONAL CORP | 67.30 | 3 | 4 | 3 | **3.3** | 18.4 | 2.8 | 2,002 |
| VSTO | VISTA OUTDOOR INC | 20.74 | 1 | 4 | 5 | **3.3** | 13.1 | (43.8) | 1,183 |
| MHK | MOHAWK INDUSTRIES INC | 257.18 | 4 | 5 | 2 | **3.7** | 18.1 | 28.8 | 19,118 |
| BECN | BEACON ROOFING SUPPLY INC | 52.25 | 3 | 4 | 4 | **3.7** | 20.4 | 14.5 | 3,569 |
| SSD | SIMPSON MANUFACTURING INC | 49.28 | 4 | 5 | 3 | **4.0** | 22.8 | 15.4 | 2,345 |
| TPH | TRI POINTE GROUP INC | 14.71 | 4 | 4 | 4 | **4.0** | 10.4 | 28.1 | 2,226 |
| JCI | JOHNSON CONTROLS INTL PLC | 41.35 | 5 | 5 | 5 | **5.0** | 14.3 | 3.2 | 38,928 |

Source: Empirical Research Partners Analysis.