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The U.S. Housing Market: Where We Stand

January 16, 2019

Making Sense of the Latest Slowdown

What Gives?

- When it comes to ascribing blame for the latest slowdown in housing, there are a lot of factors to consider and a vast amount of data to interpret. The aim of this report is to assess the housing market's character across a broad array of dimensions spanning demographics, mobility, affordability and inventory availability. We also seek to put monetary and tax policy into context since they've served to stir up some powerful crosscurrents. Tax policy has incrementally hurt the case for homeownership, but we think mortgage rates probably represent the bigger challenge.
- The prime home buying cohort is growing, but Millennials have been slow to form families and even slower to bear children. Boomers meanwhile account for nearly 30% of all homeowners, but they're half as likely to move as the average person. The result has been declining mobility rates. That's not an entirely new phenomenon, but it's no longer being offset by falling mortgage rates. Now that the prevailing mortgage rate has crossed above that for the average loan on the books, we're more apt to see the effects of reduced mobility play out.

The Generational Handoff

- Many parts of the economy are seeing a generational handoff with the Boomers passing the baton to Millennials. This shift has been underway in the labor market for nearly a decade and it's modestly depressed wage growth in the process. There's a similar dynamic at work in the housing market. While Gen Xers represent equal shares of the buyer and seller populations, Millennials account for 35% of buyers but only 20% of sellers. Boomers on the other hand are net sellers of premium properties.
- We're seeing some imbalances across the market. For example, the price of a 3-bedroom home is now half the price of one with five or more bedrooms. That ratio stood just above 40% a handful of years ago. Along the same lines, the number of buyers in the starter home market far outnumbers the sellers while the opposite is true in the premium end of the market. There's reason to fear that as Boomers age and downsize, buyers and sellers won't find common ground. Thus far inventory seems to be clearing without getting stale and prices have generally remained firm across most categories.

Is the Tax Legislation to Blame?

- By limiting the deductibility of property taxes the Tax Cuts and Jobs Act reduced what had been a $34 billion benefit of homeownership, particularly at the higher-end of the market where supply may already be outstripping demand. Mortgage interest deductibility has also been reduced. The latter is a bigger nut but it's less compromised, since the legislation affects fewer filers. Researchers have estimated the combination of the two provisions could have as much as a (6)% impact on home values. We'd expect something closer to (2)% using the Joint Committee on Taxation's estimates as a guide.
- In order to determine whether the tax changes have already affected the housing market, we've analyzed zip-code level data that depicts what share of tax returns claim a property tax deduction. We've done the same for mortgage interest. In areas with high property taxes we examined the recent trends in both home sales and prices and came away thinking that changes to the tax code have not been playing a leading role in the softening of the market.

Conclusion: Housing Remains Investable, Especially if Rates Prove to Be Self-Normalizing

- Housing can often serve as a canary in the coal-mine. As such, it tends to inform our understanding of the economy's overall interest rate sensitivity. So far it's been higher than many have expected despite a deep well of pent-up demand. Housing activity, including turnover and new construction has borne the brunt of rising rates while prices have held up better. Our view is that housing remains an attractive arena, but it might be best to back stories that are more closely tied to values as opposed to construction, including home improvement retailers.
- Large-capitalization homebuilders have bounced from their lows, but they're still trading at less than half the market's multiple. Builders face a more binary outcome than other home-related stocks, but cheap valuation, a healthy lending backdrop and a reflexive interest rate environment are positives.

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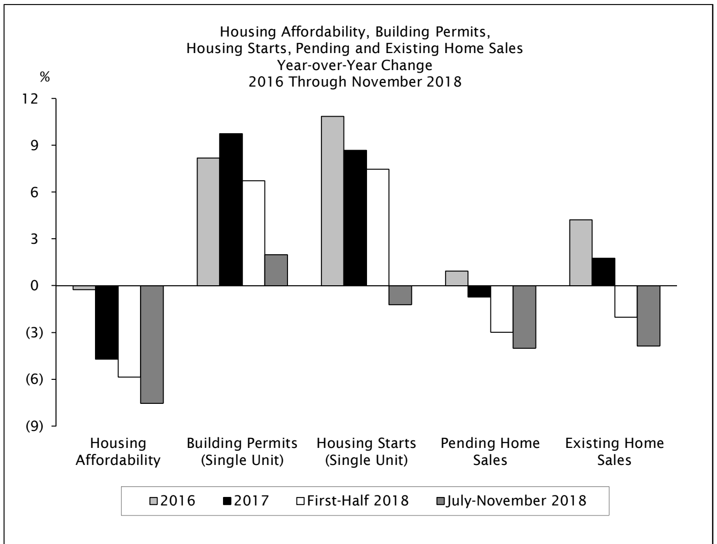
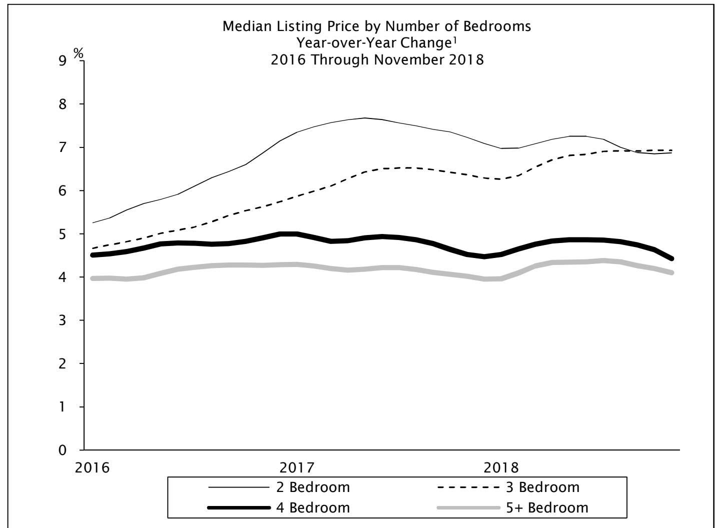
Conclusions in Brief

- Housing activity has hit a wall:



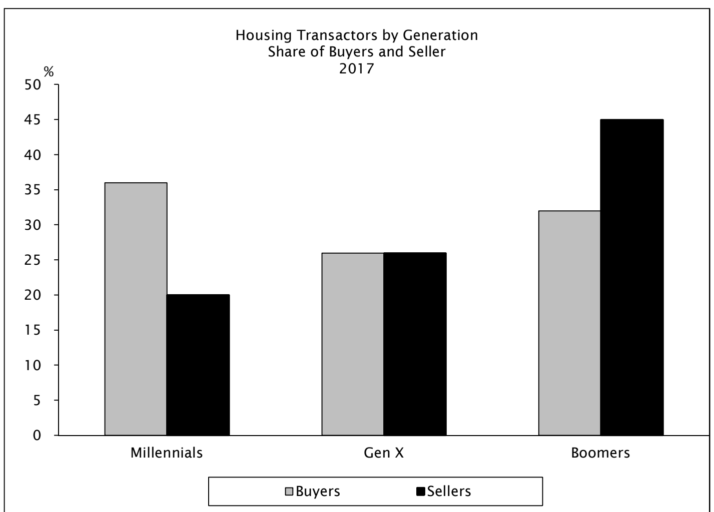
Source: Census Bureau, National Realtor Association, Empirical Research Partners Analysis.

- Prices have so far held up better, but there's some imbalance:



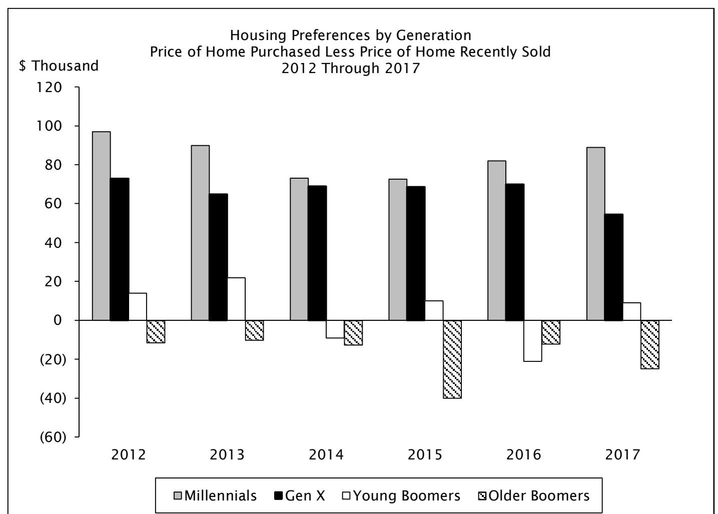
Source: Zillow, Empirical Research Partners Analysis.
[1] Data smoothed on a three-month basis.

- Boomers and Millennials appear to be trading places:



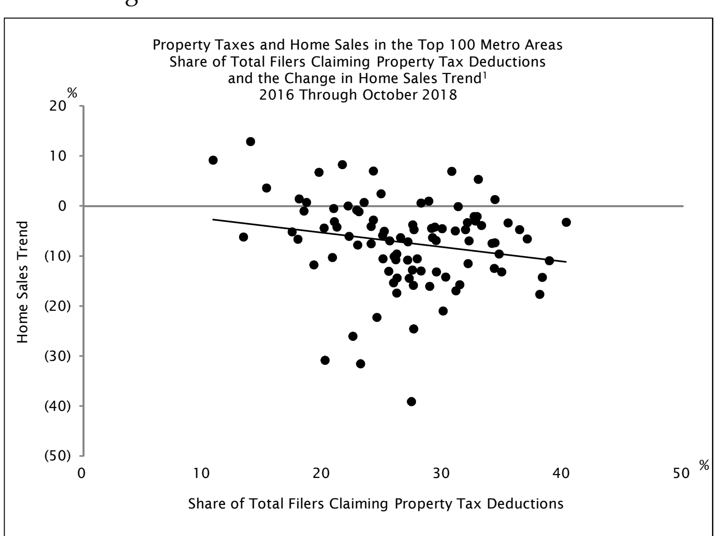
Source: National Associaton of Realtors, Empirical Research Partners Analysis.

- Millennials with means have been stepping up, consistent with their Gen X peers:



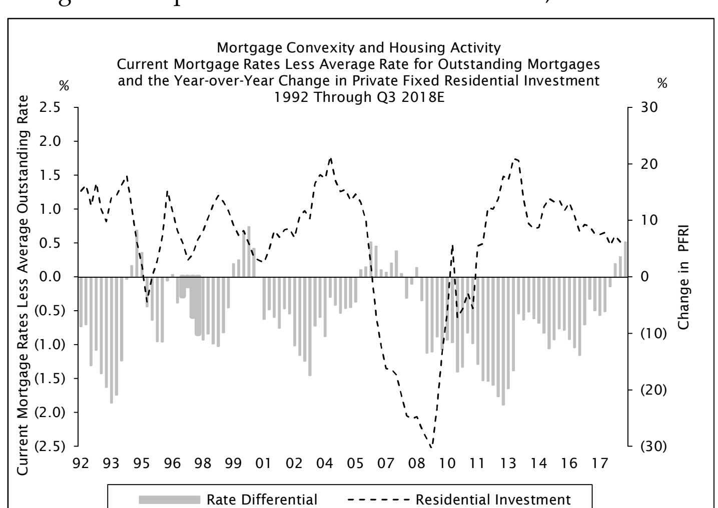
Source: National Association of Realtors, Empirical Research Partners Analysis.

- Tax policy has not helped matters, but it's probably not played a leading role in the slowdown:



Source: Zillow, IRS, Empirical Research Partners Analysis.
[1] Home sales trend reflects 2018 growth less the average of the preceeding two years.

- We think mortgage rates are the bigger factor. When prevailing rates eclipse the rate for loans on the books, it's mattered:



Source: Freddie Mac and NBER, Bureau of Economic Analysis, Berger, D. W., Milbradt, K., Tourre, F. and Joseph Vavra, 2018. "Mortgage Prepayment and Path-Dependent Effects of Monetary Policy," NBER Working Paper 25157, Empirical Research Partners Analysis.

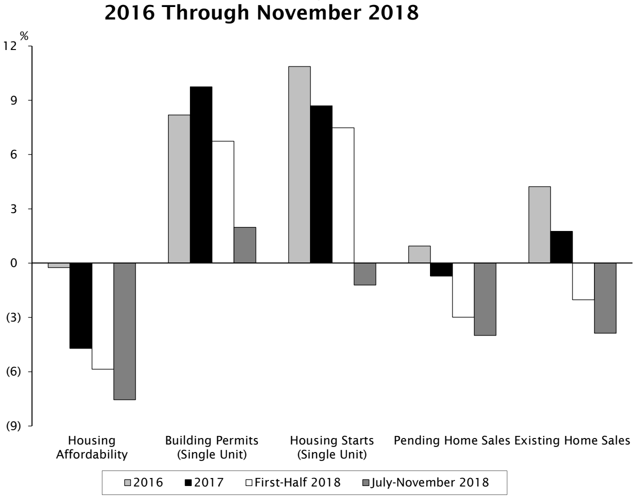
The U.S. Housing Market: Where We Stand

What Gives?

The U.S. housing market has hit a wall. Prices have held up well in most segments of the market but activity has rolled over (see Exhibit 1). This comes despite the fact that homeownership rates are still depressed. There are a lot of forces at work and myriad data sets to consider. The aim of this report is to assess the housing market across a broad array of dimensions spanning demographics, mobility, affordability and inventory availability. We also seek to put monetary and tax policy into context, since they've served to stir up powerful cross currents. Tax policy has incrementally hurt the case for homeownership, but we think interest rates represent the bigger challenge.

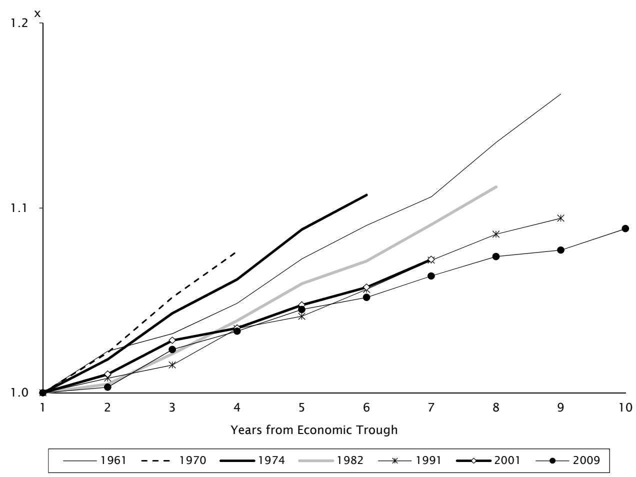
Housing is a tempting investment opportunity since the lending environment has remained tame and there's still a fair amount of pent-up demand in the system, but it's proven to be price sensitive. With that in mind, we'd advocate investing in stocks that are tied to home values as opposed to construction. Investment in homebuilders may be a bit more binary, but we're not averse to them entirely as their valuations on recent fundamentals aren't demanding and the stocks have begun to brace for recession. So long as the Fed is paying attention, feedback from housing activity back to rates can prove to be self-normalizing, leaving mortgage rates range bound.

Exhibit 1: Housing Affordability, Building Permits, Housing Starts, Pending and Existing Home Sales
Year-over-Year Change
2016 Through November 2018



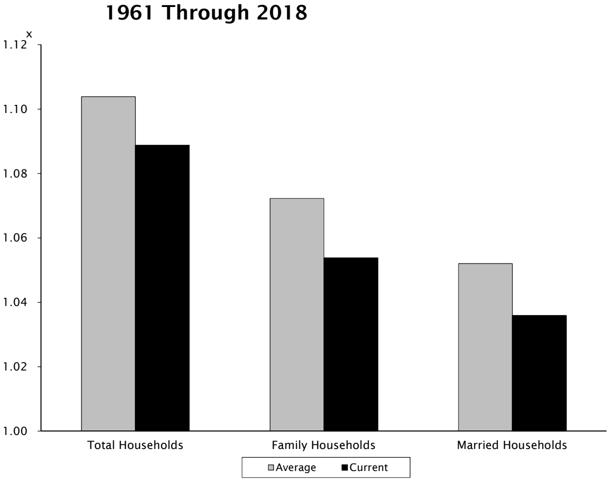
Source: Census Bureau, National Association of Realtors, Empirical Research Partners Analysis.

Exhibit 2: Household Formation by Economic Cycle
Indexed to Economic Trough
1961 Through 2018



Source: Census Bureau, Empirical Research Partners Analysis.

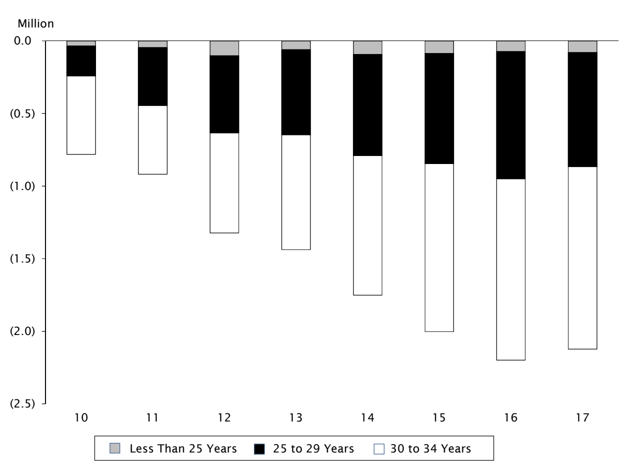
Exhibit 3: Household Formation
Growth in the Current Cycle Compared to Those in Past Recoveries[1]
1961 Through 2018



Source: Census Bureau, Empirical Research Partners Analysis.

[1] Past recoveries reflect on average of 1961, 1970, 1974, 1982, 1991, 2001.

Exhibit 4: Homeownership Deficit by Age
Owner Households Compared to Baseline[1]
2010 Through 2017



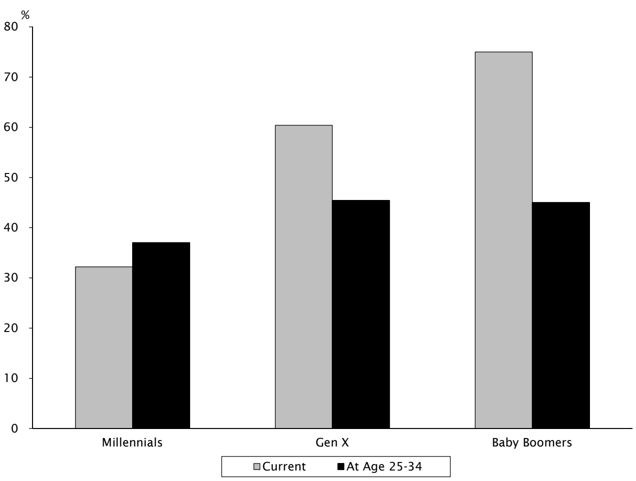
Source: Federal Reserve Bank of New York: Survey of Consumer Expectations, Empirical Research Partners Analysis.

[1] Baseline uses 2000 ratio of homeowners-to-population.

Demographic Headwinds and Tailwinds

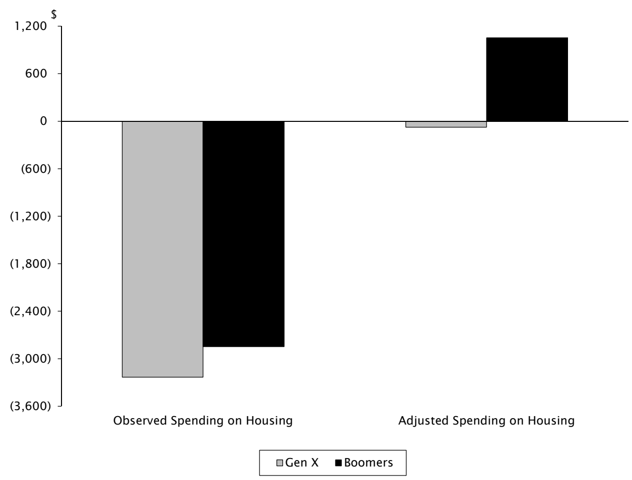
Household formation has been lackluster this cycle even though it's gone on longer than nearly all other post-war recoveries. The trajectory of the current recovery, depicted in Exhibit 2 (overleaf) has been fairly flat, and it would've been even flatter if we look at households with families (see Exhibit 3 overleaf). It's tempting to pin the blame on Millennials for not pulling their weight as they alone might account for a 2 million-unit shortfall in aggregate homeownership (see Exhibit 4 overleaf). Only 37% of 25-34 years olds owned a home in 2015, well short of the 45% rate seen for Boomers and Gen Xers when they were of similar age, though differences in the economy had a lot to do with that (see Exhibit 5). The Fed recently released a study that tracked Millennials' home buying patterns and found them to be quite similar to those of Boomers and Gen Xers. Exhibit 6 shows that Millennials currently spend $3,000 less on housing per annum, but when they held age and other variables constant, the researchers found that Millennials spend as much Gen Xers do on housing and more than Boomers. This is consistent with our long-held view that the Millennial apple will not fall far from the proverbial Boomer tree. Catching up however, will take time.

Exhibit 5: Homeownership Rates by Generation
Current and Age Equivalent Rates
1990 Through 2015



Source: Urban Institute, Empirical Research Partners Analysis.

Exhibit 6: Spending on Housing by Generation
Millennials Compared to Other Generations
Before and After Adjustments[1]
2016



Source: Kurz, C., Li, G. and Daniel Vine, 2018. "Are Millennials Different?," Finance and Economics Discussion Series 2018-080, Empirical Research Partners Analysis.

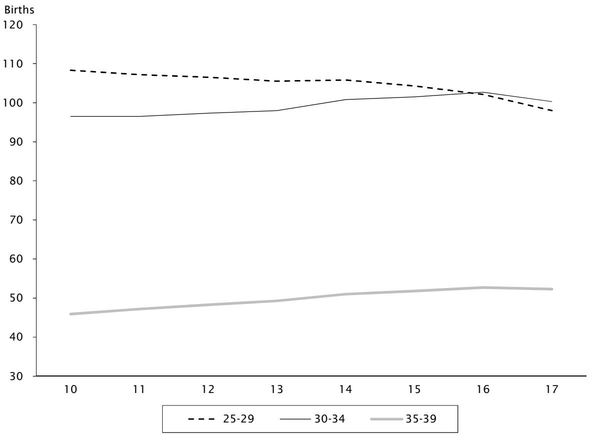
[1] Adjustments made to normalize for age, economic and demographic variables.

According to the Center for Disease Control, the birth rate in the U.S. hit a new low in 2018. Fertility rates of women aged 25-29 have fallen by (10)% since 2010. The rate for women aged 20-24 is down by twice that amount, and it's only been modestly offset by the childbearing of older women (see Exhibit 7). Of course, births can only be delayed for so long. Mother Nature will ultimately have her say … so will Father Time (see Exhibit 8). The prime home buying age cohort is growing, but having children is an important catalyst. And since Millennials appear to be having fewer of them, the demand for housing might be slow to develop. This is not a new phenomenon. Exhibit 9 shows that marriage rates have been steadily declining for 30 years -- since the Boomers were coming of age. The same is true for mobility rates, or the tendency to move that's been declining across most age cohorts, including the younger ones (see Exhibit 10). What's changed is that interest rates are no longer falling, and until recently that favorable dynamic helped to counteract this force.

Pent-Up Demand Appears to Be Price Sensitive

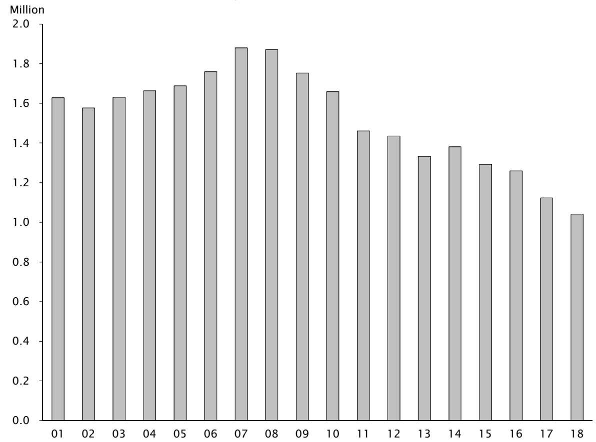
For the last 10 years -- and much of the last 20 -- mortgage rates have been below the average outstanding rate of the stock outstanding (see Exhibit 11). This helped to spur activity through refinancing and housing turnover, offsetting some of the drag that's been associated with reduced mobility and an aging population. Mortgage rates are now in flux. It's hard to know where they'll be in a year's time, but we think they're likely to be range-bound owing to the economy's reflexivity. The system seems to be operating with an efficient feedback loop that should allow the interest rate environment to be self-normalizing. Weaker home sales may themselves serve as a natural upper bound for rates. In the past, residential activity has been sensitive to mortgage rates when they're at or above the average rate for the installed base (see Exhibit 12). Consumers could be less sensitive this time around given the sheer amount of pent-up demand of first-time home buyers in the system, but that's not proven to be the case lately.

Exhibit 7: Birth Rate by Age of Mother
Births per 1,000 Women
2010 Through 2017



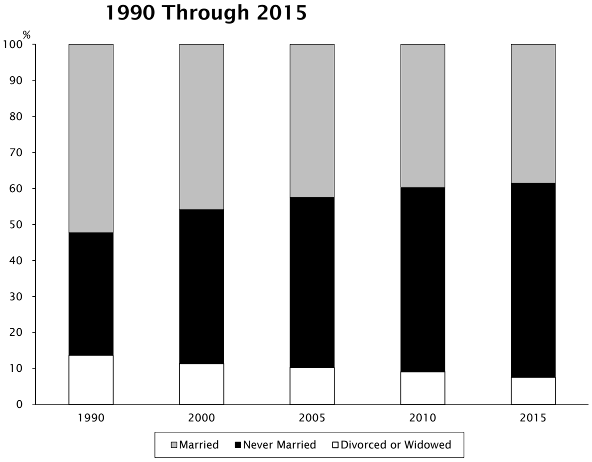
Source: Center for Disease Control, Empirical Research Partners Analysis.

Exhibit 8: Natural Population Change
Births Less Deaths
2001 Through 2018



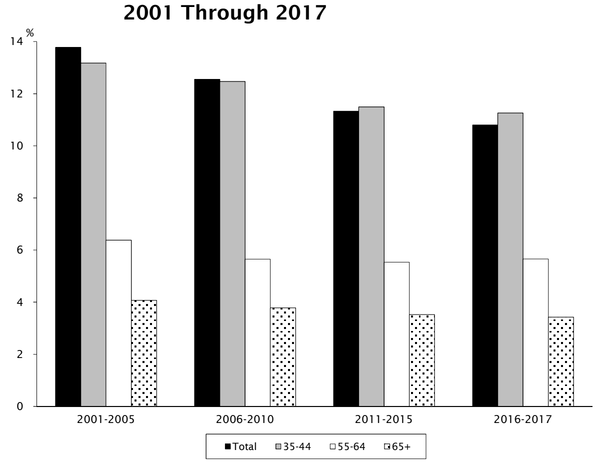
Source: Center for Disease Control, Empirical Research Partners Analysis.

Exhibit 9: Marital Status for Household Heads Ages 18-34
Share of Total Cohort Households
1990 Through 2015



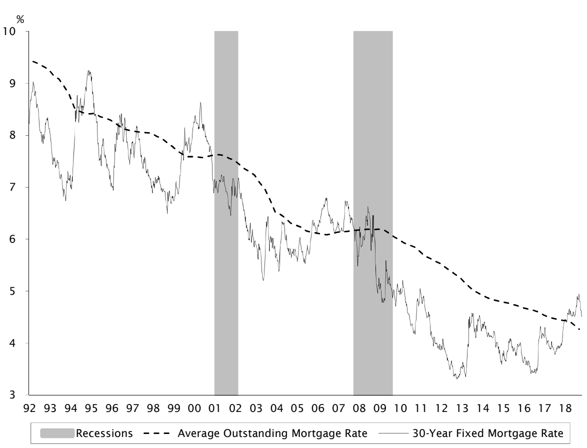
Source: Urban Institute, Empirical Research Partners Analysis.

Exhibit 10: Mobility Rate by Age
Movers as a Share of Cohort
2001 Through 2017



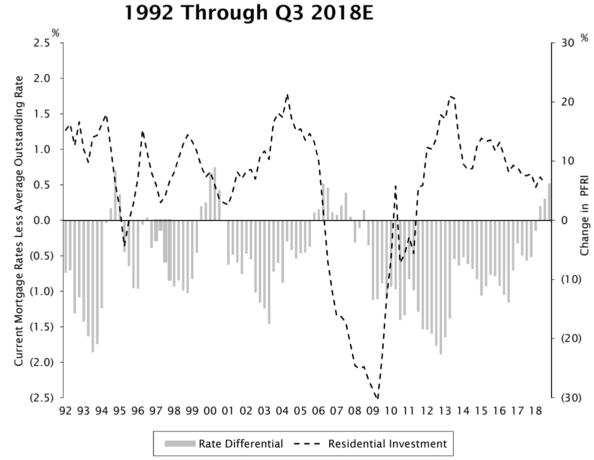
Source: Census Bureau, Empirical Research Partners Analysis and Estimates.

Exhibit 11: Average Rate on Outstanding Mortgages
and the 30-Year Fixed Mortgage Rate
1992 Through Early-January 2019



Source: Berger, D. W., Milbradt, K., Tourre, F. and Joseph Vavra, 2018. "Mortgage Prepayment and Path-Dependent Effects of Monetary Policy," NBER Working Paper 25157, Freddie Mac, NBER.

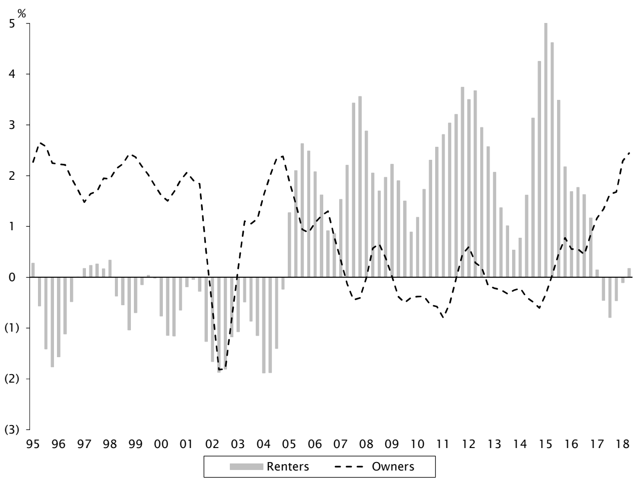
Exhibit 12: Mortgage Convexity and Housing Activity
Current Mortgage Rates Less Average Rate for Outstanding Mortgages
and the Year-over-Year Change in Private Fixed Residential Investment
1992 Through Q3 2018E



Source: Freddie Mac, NBER, Bureau of Economic Analysis, Berger, D. W., Milbradt, K.,Tourre, F. and Joseph Vavra, 2018. "Mortgage Prepayment - and Path Dependent Effects of Monetary Policy," NBER Working Paper 25157, Empirical Research Partners Analysis.

In the wake of the last recession, newly-formed households gravitated to renting for a variety of reasons. As a result, the rental stock of housing is +17% higher than it was in 2010, even as owner-occupied housing has grew by only +4% (see Exhibit 13). After a long drought, owners are currently growing faster than renters, but this demand can be fungible. An elevated rental stock – particularly for single-family units – can serve as a buffer by creating home sales without necessitating construction (see Exhibit 14). Single-family rentals rose from the ashes of the last downturn, and they account for nearly 12% of the housing stock, or 16 million units. Researchers have found that this phenomenon could serve to limit new construction. Inventory of single family rentals – especially those that are fairly newly-built – could allow the housing stock to transition from rentals to owned homes and act like a vacancy rate that expands and contracts with only minimal economic activity.[1] A transition from renting to owning is already playing out, though not necessarily within the same house. Roughly 1.7 million households transitioned from renting to ownership in 2017 alone, an effect that was almost entirely driven by younger households (see Exhibits 15 and 16).

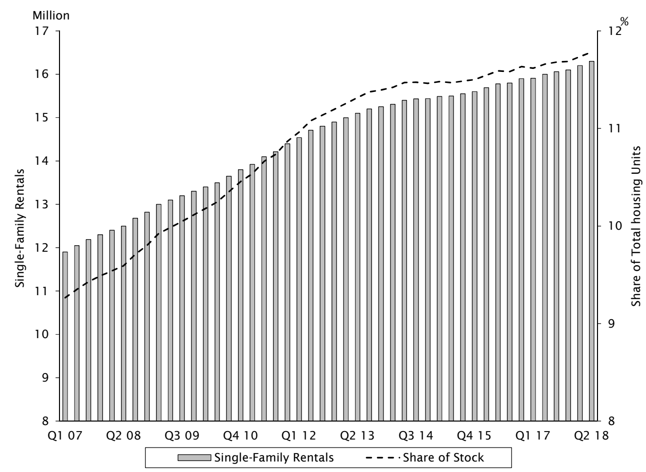
Exhibit 13: Owner and Renter Households
Year-Over-Year Growth[1]
1995 Through Q3 2018



Source: Census Bureau, Empirical Research Partners Analysis.

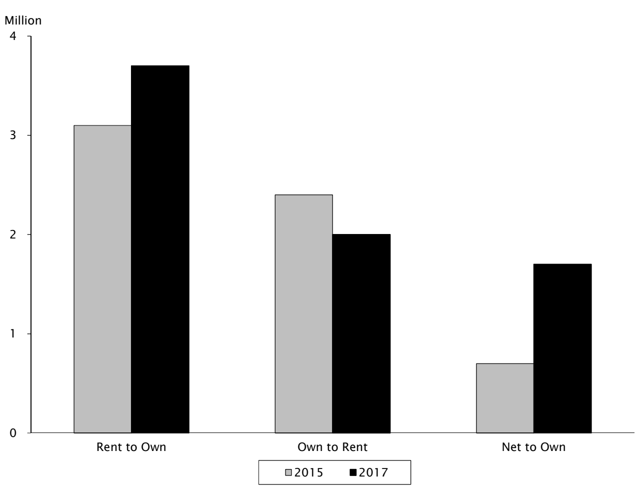
[1] Data smoothed nine months.

Exhibit 14: Single-Family Rentals
Units and Share of the Housing Stock
2007 Through Q2 2018



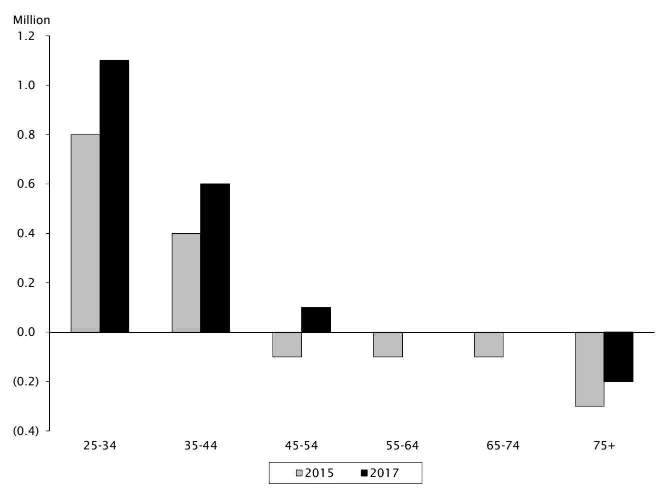
Source: Census Bureau, American Homes for Rent, 2019. *Investor Highlights* November 2018

Exhibit 15: Owners and Renters
Number of Households Transitioning
from Renters to Owners
2015 and 2017



Source: Joint Center for Housing Studies at Harvard University, Empirical Research Partners Analysis.

Exhibit 16: Housing Tenure Changes by Age
Net Rent-to-Own Transitions
2015 and 2017



Source: Joint Center for Housing Studies at Harvard University, Empirical Research Partners Analysis.

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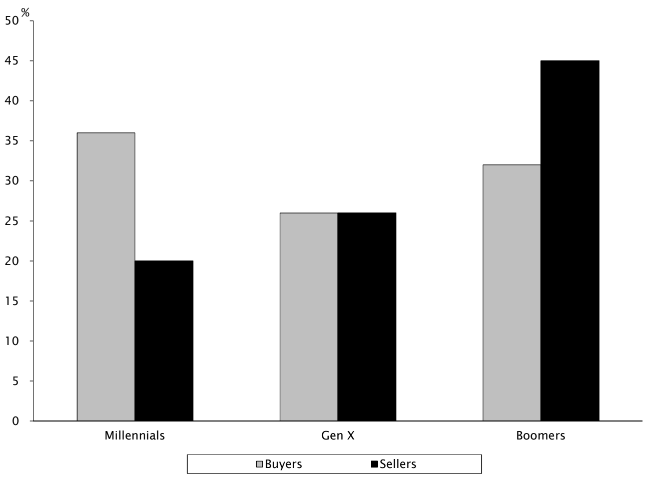
[1] Rosenthal, Stuart, 2018. "Owned Now, Rented Later? Housing Stock Transitions and Market Dynamics," Syracuse University, Research Institute for Housing America.

The Generational Handoff

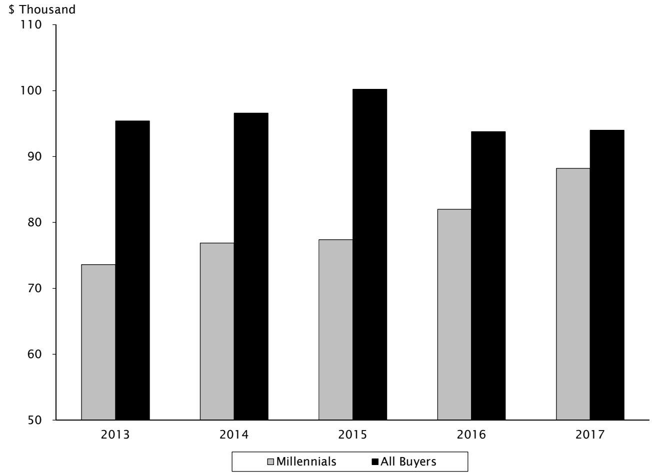
Gen Xers are the most self-sufficient demographic cohort, representing an equal number of home buyers and sellers. Millennials are net buyers and the demand they represent will somehow need to be reconciled with the Boomers that are net sellers (see Exhibit 17). This is likely to create a mismatch at some level, but data from the National Association of Realtors seems to suggest that the differences may be reconcilable. Millennial home buyers have seen their income rise over time and nearly match that of other generations, so they're buying homes of equal size and value to what the Boomers might be selling (see Exhibits 18 through 20). They've also been trading up as we'd expect for a group that's still entering the market (see Exhibit 21). The key variable will be how those that haven't yet entered the housing market will behave.

**Exhibit 17: Housing Transactors by Generation
Share of Buyers and Seller
2017**



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

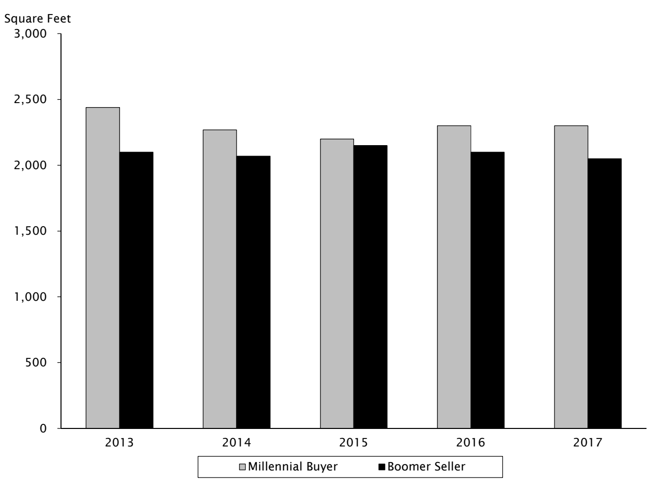
**Exhibit 18: Median Income of Home Buyers
Millennials and All Buyers
2013 Through 2017[1]**



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

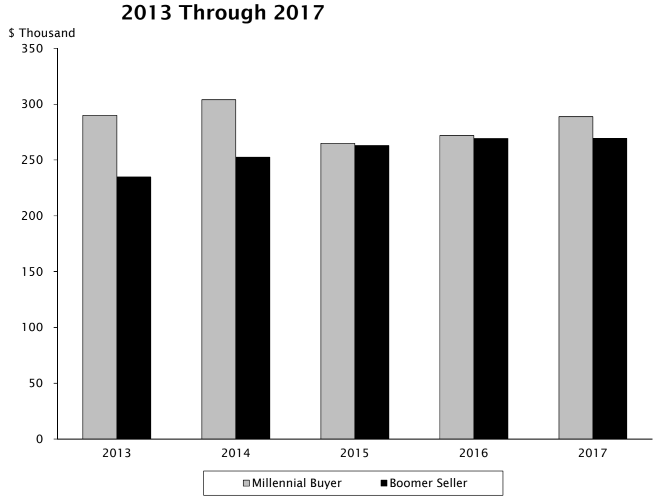
[1] Income is for the preceding year.

**Exhibit 19: Size of Homes Sold and Bought by Generation
Millennial Buyers and Boomer Sellers
2013 Through 2017**



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

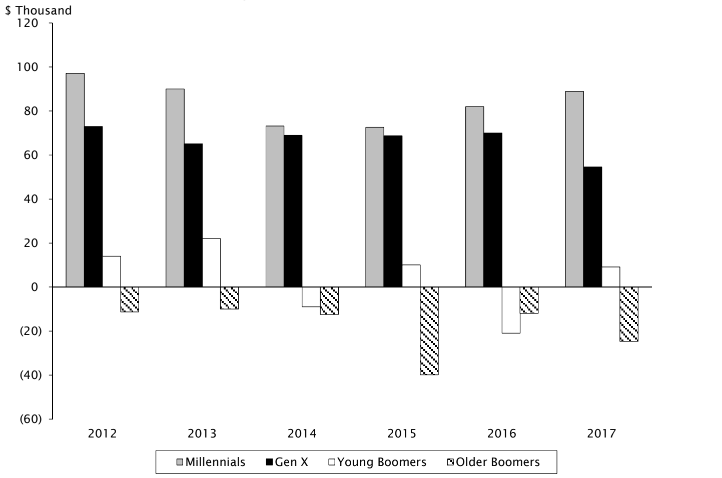
**Exhibit 20: Average Price of Homes Sold and Bought
by Generation
Millennial Buyers and Boomer Sellers
2013 Through 2017**



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

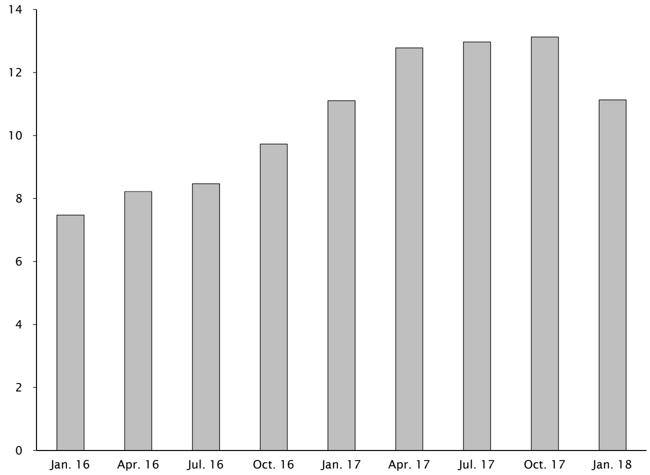
Other data suggests the market isn't in equilibrium. Trulia, an online real estate site, calculates a mismatch score based on supply and demand for homes at the local level. As of the last reading, the mismatch seemed to be pronounced (see Exhibit 22). The condition is especially clear when we compare starter homes and premium ones (see Exhibit 23). Starter homes for example, account for only 22% of total listings, a proxy for supply. But when it comes to demand, this tier of home has been attracting nearly 30% of home visits. Premium homes are also attracting 30% of home visits, but they're not as well positioned given that they represent 50% of reported listings. We've begun to see this show up in inventory trends. Inventory of starter homes is tight and they're not seeing as much discounting as higher tiers (see Exhibits 24 and 25). This has altered the pricing dynamic a bit, but price trends are still fairly healthy across the board (see Exhibit 26).

Exhibit 21: Housing Preferences by Generation
Price of Home Purchased Less Price of Home Recently Sold
2012 Through 2017



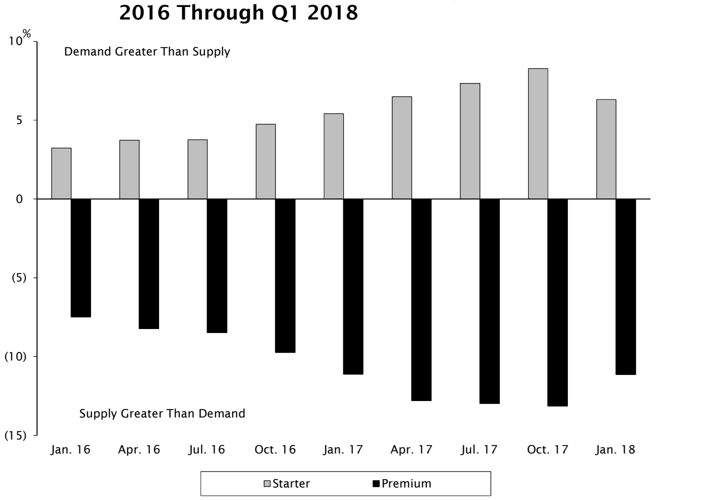
Source: National Association of Realtors, Empirical Research Partners Analysis.

Exhibit 22: Housing Supply and Demand
Mismatch Score
2016 Through Q1 2018



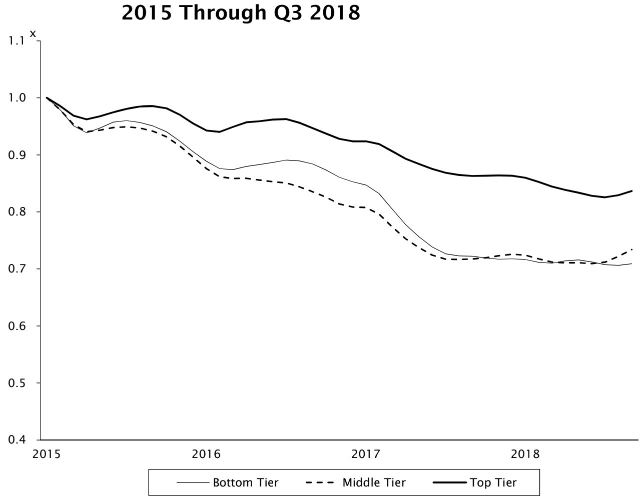
Source: Trulia, Empirical Research Partners Analysis.

Exhibit 23: Housing Demand and Supply by Tier
Share of Home Visits Less Listings
2016 Through Q1 2018



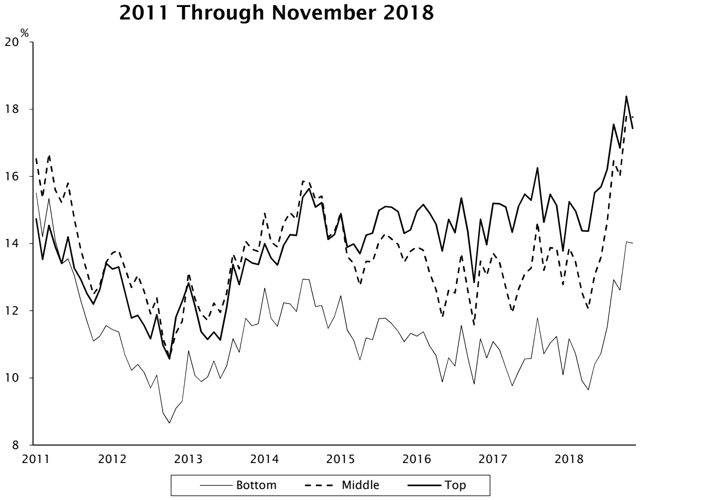
Source: Trulia, Empirical Research Partners Analysis.

Exhibit 24: Housing Inventory by Tier
Inventory Level Indexed to Q1 2015
2015 Through Q3 2018



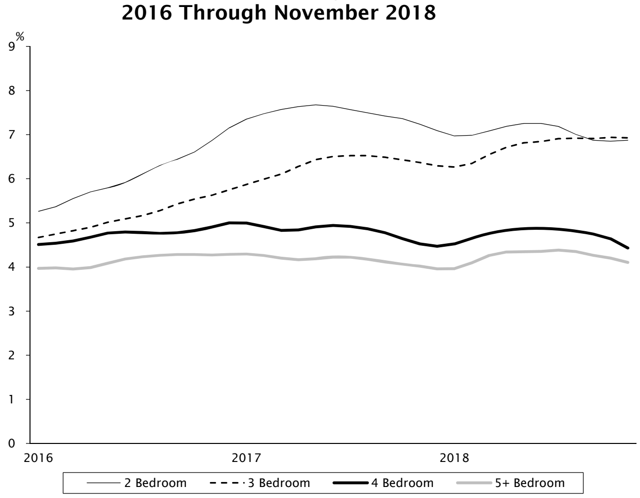
Source: Zillow, Empirical Research Partners Analysis.

Exhibit 25: Home Price Change by Tier
Share of Listings with Price Cuts
2011 Through November 2018



Source: Zillow, Empirical Research Partners Analysis.

Exhibit 26: Median Listing Price by Number of Bedrooms
Year-over-Year Change[1]
2016 Through November 2018



Source: Zillow, Empirical Research Partners Analysis.

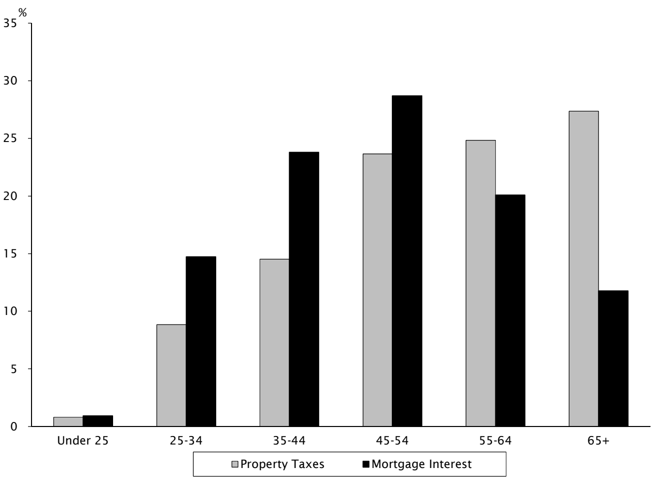
[1] Data smoothed on a three-month basis.

Measuring the Effects of Tax Policy

Tax policy has added to the uncertainty. The Tax Cut and Jobs Act of 2017 (TCJA) was a bounty for corporate America and for some consumers, but it was not as kind to homeowners. At a high level, falling tax rates tend to hurt the value of assets that've historically been shielded from taxes, like housing. The bill also targeted housing explicitly by reducing the deductibility of property tax and mortgage interest payments. Exhibit 27 shows how property taxes and mortgage interest payments scale with age. Not surprisingly, mortgage payments are more front-end loaded. Older households are more likely to have paid down balances, but they're still apt to own property. According to the Office of Tax Analysis, the U.S. Treasury forgoes approximately $34 billion per year in tax revenue by allowing homeowners to deduct state and local property taxes. That is less than the $65 billion that's forgone each year to allow for mortgage deductibility, but the property tax provision in the TCJA should have a greater effect on the housing market since it'll affect far more filers.

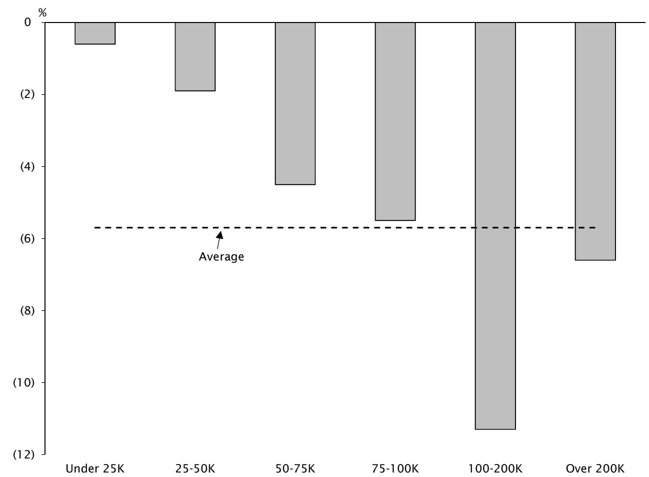
The Federal Reserve has tried to estimate what the combined effects on housing might look like. The researchers suggest that the changes in the tax code could detract an average of (6)% from the home price trajectory. This seems high considering that the Joint Committee on Taxation put the total onus of repealing itemized deductions at less than 3% of aggregate home value. The Fed analysis could therefore be characterized as an upper bound. The analysis however, is still helpful since it illustrates how the effect would scale by income level (see Exhibit 28).

Exhibit 27: Property Taxes and Mortgage Interest by Age
Distribution of Aggregate Expense
2017



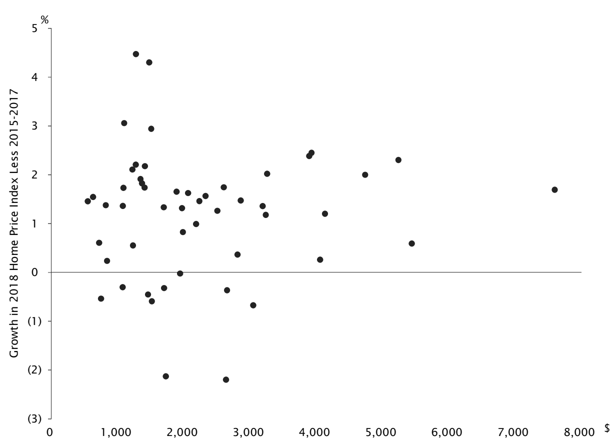
Source: Bureau of Labor Statistics: Consumer Expenditure Survey, Empirical Research Partners Analysis.

Exhibit 28: Home Prices and the Tax Cut by Income Cohort
Simulated Impact of Tax Reform on Home Values
As of 2018



Source: Martin, H., 2018. "The Impact of the Tax Cuts and Jobs Act on Local Home Values," Federal Reserve Bank of Cleveland, Working Paper No. 18-06., Empirical Research Partners Analysis.

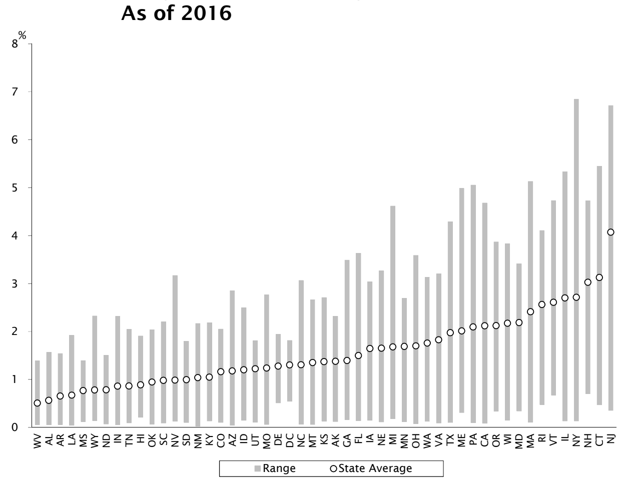
Exhibit 29: Home Price Trends and Property Taxes by State
State-Level Home Price Trend and Median Property Taxes[1]
2015 Through October 2018



Source: Federal Housing Finance Agency, Federal Reserve Bank of St. Louis, The Tax Foundation, Wallethub, Empirical Research Partners Analysis.

[1] Home price trends reflects 2018 change less the rate of change seen in 2015-2017.

Exhibit 30: Property Taxes by State and Zip Code
Range of Property Taxes as a Share of Adjusted Gross Income[1]
Range and State Average
As of 2016

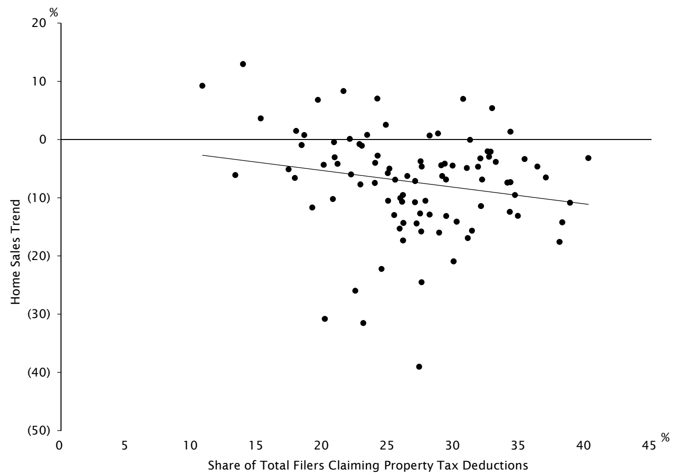


Source: IRS, Empirical Research Partners Analysis.

[1] Excludes zip codes with no property taxes claimed.

It's possible that the trend will take time to rear its head, but we don't see strong signs emerging just yet. In Exhibit 29 (overleaf) we plot median property taxes by state to see if it's correlated with the trend in home prices. There's no clear signal, but this state-level analysis has limitations since property tax rates vary widely within a state and even within metropolitan areas (see Exhibit 30 overleaf). With that in mind, we dug a bit deeper and analyzed zip-code level data to see what share of tax filers claim property taxes on their Form 1040s. We've graphed that ratio against the trend line for home sales at the metro-area level in Exhibit 31. The share of filers tends to cluster at around 25%, but the data suggests we've seen only a modest influence on the trend in home sales. The pattern however, is downward sloping as we might expect. We perform the same analysis for filers that claim mortgage interest on their returns in Exhibit 32. There's a slight downward slope to the line here as well, suggesting that a change in mortgage interest deductibility may have played a role in dampening home sales, but probably not a leading one. We further adjust the analysis in Exhibit 33 to look at the dollars of property taxes claimed relative to adjusted gross income, but this relationship is even harder to detect. The data that we've analyzed seems to indicate that neither property taxes nor mortgage interest deductibility has yet to represent a deterministic force for home sales or prices (see Exhibit 34). In Exhibits 35 and 36 we apply the analysis to the trajectory of home prices to a similar end.

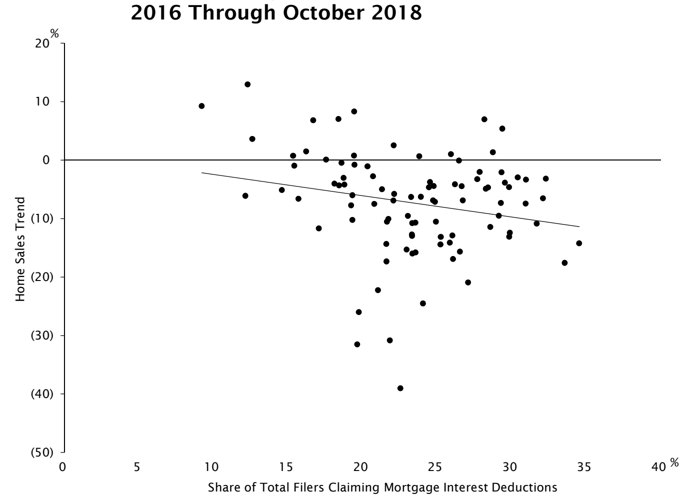
Exhibit 31: Property Taxes and Home Sales in the Top 100 Metro Areas
Share of Total Filers Claiming Property Tax Deductions
and the Change in Home Sales Trend[1]
2016 Through October 2018



Source: Zillow, IRS, Empirical Research Partners Analysis.

[1] Home sales trend reflects 2018 growth less the average of the preceding two years.

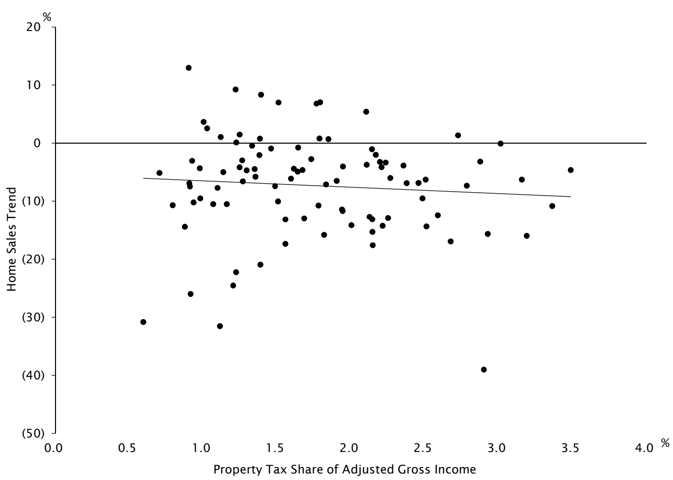
Exhibit 32: Mortgage Interest and Home Sales in the Top 100 Metro Areas
Share of Total Filers Claiming Mortgage Interest and the Change in Home Sales Trend[1]
2016 Through October 2018



Source: Zillow, IRS, Empirical Research Partners Analysis.

[1] Home sales trend reflects 2018 growth less the average of the preceding two years.

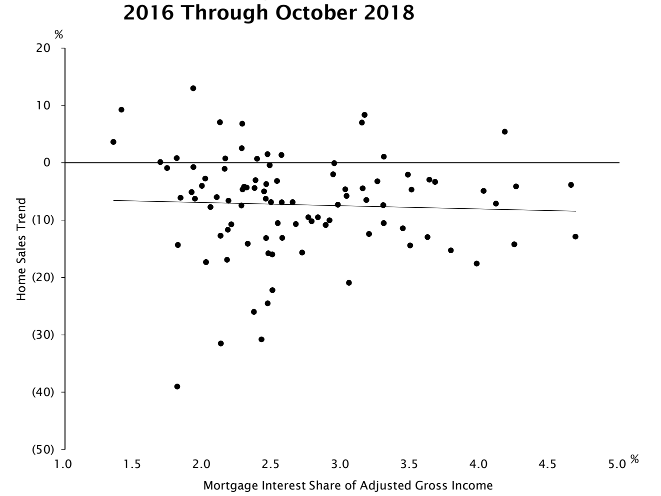
Exhibit 33: Property Taxes and Home Sales in the Top 100 Metro Areas
Property Tax Share of Adjusted Gross Income
and the Change in Home Sales Trend[1]
2016 Through October 2018



Source: Zillow, IRS, Empirical Research Partners Analysis.

[1] Home sales trend reflects 2018 growth less the average of the preceding two years.

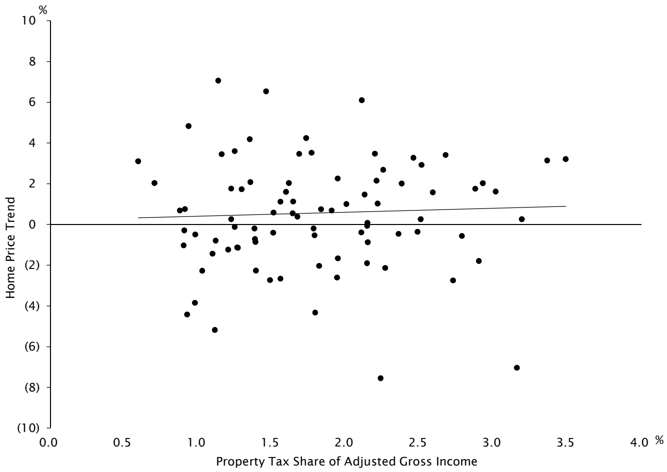
Exhibit 34: Mortgage Interest and Home Sales in the Top 100 Metro Areas
Mortgage Interest Share of Adjusted Gross Income and the Change in Home Sales Trend[1]
2016 Through October 2018



Source: Zillow, IRS, Empirical Research Partners Analysis.

[1] Home sales trend reflects 2018 growth less the average of the preceding two years.

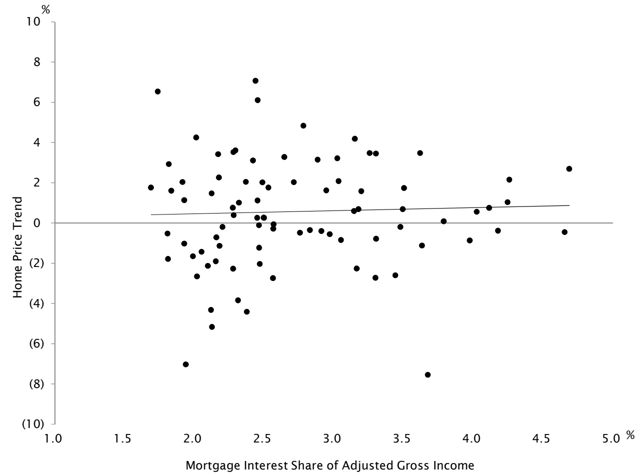
Exhibit 35: Property Taxes and Top Tier Home Prices in the Top 100 Metro Areas Property Tax Share of Adjusted Gross Income and the Change in Top Tier Home Price Trend[1] 2016 Through October 2018



Source: Zillow, IRS, Empirical Research Partners Analysis.

[1] Home sales trend reflects 2018 growth less the average of the preceding two years.

Exhibit 36: Mortgage Interest and Top Tier Home Prices in the Top 100 Metro Areas Mortgage Interest Share of Adjusted Gross Income and the Change in Top Tier Home Price Trend[1] 2016 Through October 2018



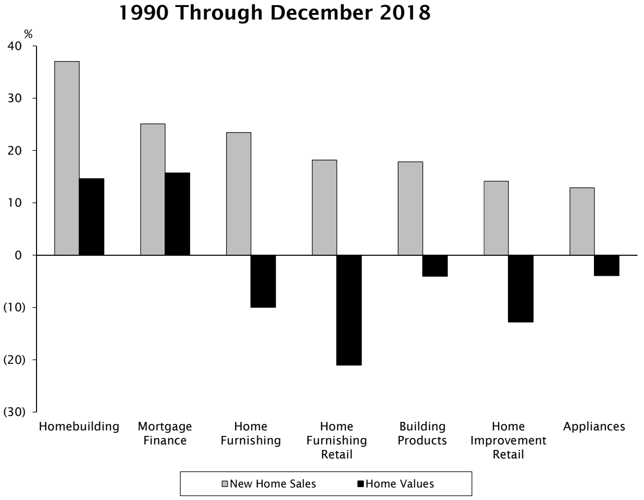
Source: Zillow, IRS, Empirical Research Partners Analysis.

[1] Home sales trend reflects 2018 growth less the average of the preceding two years.

Conclusion: Stocks Tied to Activity Feel Like a Rate Call. Those Tied to Values Have More Ways to Win

It's too soon for the academic research community to opine on the subject, but our early read is that changes in the housing market have less to do with fiscal policy and more to do with monetary policy. Said another way, we're probably in the midst of a classic, interest-rate induced slowdown. There's still plenty of demand under the surface, but its price sensitive. If mortgage rates dip back below the average outstanding rate, it could make sellers more willing to move, but that's a hard call to make so we're not sure betting on increased mobility, construction or other activity is the best approach. We think that exposure to housing is a good idea in general, but it might make sense to center the thesis on stocks tied to home values as opposed to turnover. These would include home improvement retail stocks (see Exhibit 37). Building products stocks don't rank as well in our core model framework, but they appear to be braced for recession (see Exhibit 38). Homebuilders are more dependent on housing activity, but we're not opposed to them. They too have baked in recession fears (see Exhibit 39). And so long as the Fed is paying attention, it's more likely than not that the interest rate environment will be self-normalizing. Late last year we added Home Depot to our Consumer Lens portfolio in place of NVR. That together with a long-standing position in Sherwin-Williams rounds out our exposure to housing (see Exhibit 40). In Appendix 1 on page 12 we show how stocks in the housing complex rank in our core model framework.

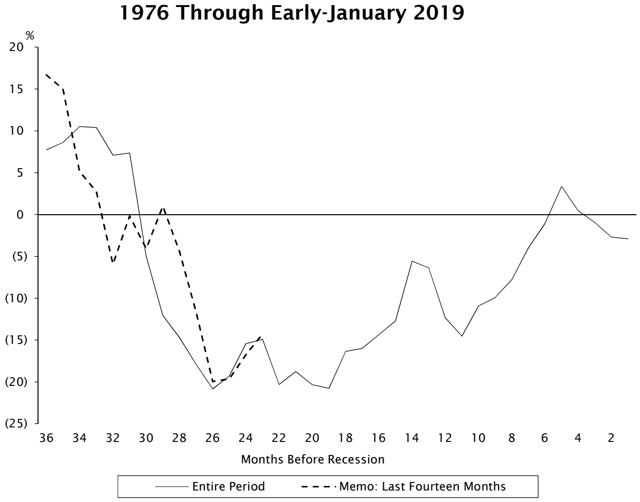
Exhibit 37: Housing-Related Stocks[1] Correlation of Returns to the Year-over-Year Change in New Home Sales and Home Prices[2] 1990 Through December 2018



Source: Census Bureau, CoreLogic, Empirical Research Partners Analysis.

[1] Drawn from the largest 1,500 stocks.
[2] Home price defined as the S&P / Case-Shiller U.S. national home price index.

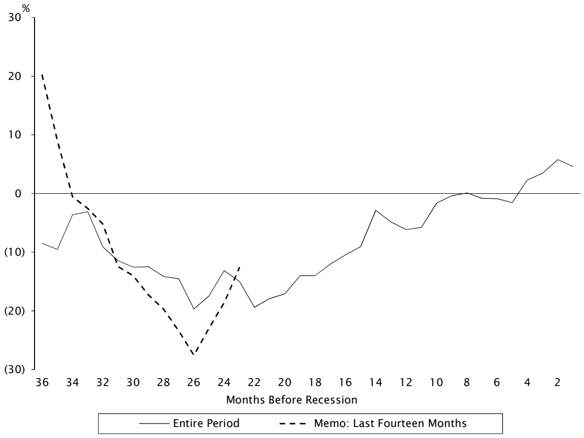
Exhibit 38: Building Products Stocks[1] Relative Returns Prior to Recessions Forward Twelve-Month Returns 1976 Through Early-January 2019



Source: NBER, Empirical Research Partners Analysis.

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

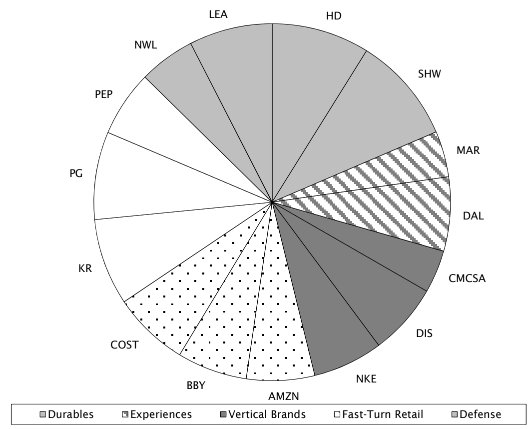
**Exhibit 39: Household Durables Stocks[1]
Relative Returns Prior to Recessions
Forward Twelve-Month Returns
1976 Through Early-January 2019**



Source: NBER, Empirical Research Partners Analysis.

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

**Exhibit 40: Consumer Lens Portfolio
Weighting by Theme
As of Mid-January 2019**



Source: Empirical Research Partners Analysis.

**Appendix 1: Housing-Related Stocks
Core Model Ranking Report
Sorted by Industry and Core Model Rank
As of Mid-January 2019**

			Quintile Ranks (1=Best; 5=Worst)							
			Super Factors							
Symbol	Company	Price	Valuation	Capital Deployment	Earnings Quality and Trend	Market Reaction	**Core Model Rank**	Forward P/E-Ratio	YTD Return	Market Capitalization ($ Million)
Homebuilders										
PHM	PULTEGROUP INC	$27.86	1	3	1	2	**1**	7.6 x	7.2 %	$7,858
TOL	TOLL BROTHERS INC	35.70	1	1	3	2	**1**	7.8	8.7	5,218
NVR	NVR INC	2,545.82	3	2	1	2	**2**	13.3	4.5	9,203
TMHC	TAYLOR MORRISON HOME CORP	17.91	1	4	3	5	**2**	7.0	12.6	2,141
LEN	LENNAR CORP	45.20	1	5	4	4	**3**	7.7	15.5	14,929
DHI	D R HORTON INC	38.42	3	3	3	2	**3**	9.1	10.8	14,456
Home Furnishings & Appliances										
NWL	NEWELL BRANDS INC	$20.30	1	2	1	4	**1**	9.6 x	9.2 %	$9,476
WHR	WHIRLPOOL CORP	123.93	1	1	3	3	**2**	7.8	16.0	7,932
HELE	HELEN OF TROY LTD	112.26	3	5	2	1	**2**	14.0	(14.4)	2,873
LEG	LEGGETT & PLATT INC	38.32	3	3	3	4	**4**	14.8	6.9	4,998
IRBT	IROBOT CORP	83.42	4	5	5	1	**4**	29.4	(0.4)	2,310
MHK	MOHAWK INDUSTRIES INC	126.01	2	5	4	5	**5**	10.8	7.7	9,401
TPX	TEMPUR SEALY INTL INC	48.82	3	5	3	3	**5**	13.3	17.9	2,661
Home-Related Retail										
LOW	LOWE'S COMPANIES INC	$96.91	2	1	1	2	**1**	16.4 x	4.9 %	$78,109
WSM	WILLIAMS-SONOMA INC	53.34	1	1	2	4	**1**	12.0	5.7	4,282
AAN	AARON'S INC	46.16	1	2	4	3	**2**	12.0	9.8	3,166
RH	RH	131.38	2	5	4	1	**2**	13.3	9.6	2,787
HD	HOME DEPOT INC	178.81	3	1	2	3	**3**	17.6	4.1	202,234
FND	FLOOR & DECOR HLDGS	31.13	5	5	4	5	**5**	27.9	20.2	3,030
Building Products										
AWI	ARMSTRONG WORLD INDUSTRIES	$64.65	5	1	1	1	**1**	14.9 x	11.1 %	$3,230
JCI	JOHNSON CONTROLS INTL PLC	32.37	2	3	2	4	**3**	17.5	9.2	29,942
LII	LENNOX INTERNATIONAL INC	224.15	5	3	1	1	**3**	18.4	2.4	9,029
AOS	SMITH (A O) CORP	46.40	3	2	1	5	**3**	16.6	8.7	7,892
SSD	SIMPSON MANUFACTURING INC	58.46	4	2	2	3	**3**	16.2	8.4	2,687
ALLE	ALLEGION PLC	81.77	4	2	5	3	**4**	16.7	2.6	7,773
FBHS	FORTUNE BRANDS HOME & SECUR	42.71	2	2	3	5	**4**	11.3	12.4	6,039
USG	USG CORP	43.07	4	5	1	2	**4**	20.1	1.0	6,019
OC	OWENS CORNING	46.77	1	3	5	5	**4**	8.6	6.9	5,113
TREX	TREX CO INC	66.83	5	5	2	1	**4**	26.2	12.6	3,927
MAS	MASCO CORP	32.44	3	3	4	5	**5**	12.1	11.3	9,910
AAON	AAON INC	35.62	5	5	5	3	**5**	28.1	1.6	1,860
Mortgage Finance										
MTG	MGIC INVESTMENT CORP/WI	$11.05	1	3	na	1	**1**	7.0 x	5.6 %	$4,002
RDN	RADIAN GROUP INC	17.16	1	4	na	1	**1**	6.1	4.9	3,661
ESNT	ESSENT GROUP LTD	36.62	1	4	na	2	**1**	7.1	7.1	3,593
WAFD	WASHINGTON FEDERAL INC	27.91	2	1	na	4	**2**	11.2	4.5	2,308
CFFN	CAPITOL FEDERAL FINL INC	13.34	3	4	na	1	**3**	17.6	4.5	1,884
NYCB	NEW YORK COMMUNITY BANCORP INC	10.17	1	4	na	5	**4**	12.7	8.1	4,987
TFSL	TFS FINANCIAL CORP	16.70	5	2	na	2	**5**	50.6	3.5	4,681
TREE	LENDINGTREE INC	256.52	5	5	na	4	**5**	49.5	16.8	3,321
CLBK	COLUMBIA FINANCIAL INC	14.96	4	3	na	4	**5**	36.4	(2.2)	1,734

Source: Empirical Research Partners Analysis.