



Don't Be Distracted by the Recent Swings in Household Formation Estimates

Household formation is essential to housing market growth.¹ During recent decades, household formation has accounted for about three-quarters of the demand for new housing units.²

In late 2014, analysts became hopeful that this fundamental market driver had finally broken out of its post-crisis doldrums. In the fourth quarter of that year, the Census Bureau's Housing Vacancy Survey (HVS) estimated that annual household growth more than doubled, reaching nearly 2 million.

More recently, however, optimism faded after two consecutive quarterly estimates from the HVS indicated that annual household growth had retreated to only about half a million per year, a level not far above the worst readings from the Great Recession. Even Federal Reserve Board Chair Janet Yellen recently cited sluggish household formation as a headwind to economic growth.³

This edition of *Housing Insights* explores the factors underlying recent volatility in HVS household growth estimates. It finds that two apparent anomalies – a historically large increase in the HVS housing unit occupancy rate during late 2014 and a divergence during the last two years between the survey's housing stock growth estimates and independent data on new housing construction – have contributed to the recent swings in the survey's household formation estimates. This *Housing Insights* creates an alternative household growth series that is based on smoothed housing occupancy rates and a new set of housing stock estimates. The new series suggests that, rather than surging and then plummeting in recent quarters, household growth has continued on a path of gradual recovery from the severe downturn of the Great Recession.

Household Growth Skyrockets in 2014...

The HVS is a quarterly sample survey designed to measure basic metrics of housing stock utilization, including housing vacancy rates and homeownership rates. Despite being widely cited as a source of household formation estimates, the HVS does *not* directly measure the total number of U.S. households. Rather, it measures the housing unit occupancy rate – the proportion of housing units that are occupied by households. The HVS housing unit occupancy rate is applied to an independent estimate of the total number of housing units (sometimes referred to as “housing control totals”) to derive an estimate of occupied housing units, or households.⁴ Estimates of household growth are then derived by calculating the difference between household estimates at any two points in time.

In the fourth quarter of 2014, the HVS annual household growth estimate suddenly surged to 1.9 million, up from only 783,000 in the preceding quarter. A key factor behind this sudden burst of household formation was a jump in the HVS

¹ In this *Housing Insights*, “household formation” and “household growth” are used interchangeably to describe the net increase in the total number of U.S. households between two points in time.

² Between 1980 and 2010, the ratio of household growth to total new private housing unit production (privately owned housing units completed plus manufactured homes placed for residential use) was 0.72. In addition to household growth, the other factors that generate demand for new housing units are net removals of units from the existing housing stock (e.g., through demolition or natural disasters) and the change in the number of vacant housing units.

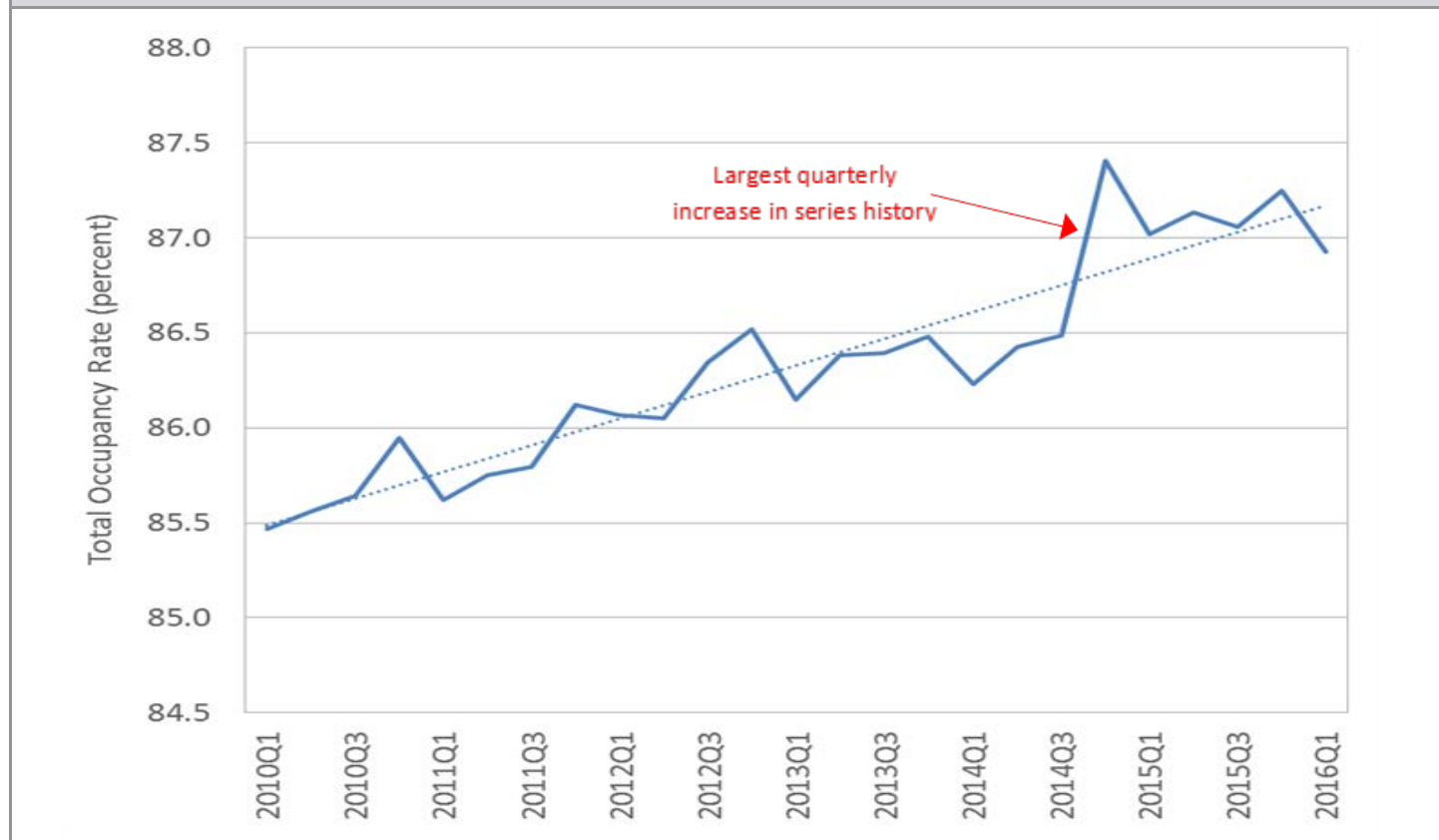
³ In a speech to The Economic Club of New York, Chair Yellen stated, “Looking beyond the near term, I anticipate that growth will also be supported by a lessening of some of the headwinds that continue to restrain the U.S. economy, which include weak foreign activity, dollar appreciation, a *pace of household formation that has not kept up with population and income growth and so has depressed homebuilding*, and productivity growth that has been running at a slow pace by historical standards since the end of the recession [emphasis added].” Although Yellen did not cite the HVS as her source of household formation estimates, her statement came only two months after the HVS first reported the dramatic retrenchment in household growth. See Janet L. Yellen, “The Outlook, Uncertainty, and Monetary Policy,” remarks before The Economic Club of New York, March 29, 2016. (<http://www.federalreserve.gov/newsevents/speech/yellen20160329a.htm>)

⁴ McCue, Masnick, and Herbert describe the HVS household estimation procedure as follows: “The HVS and ACS [the Census Bureau's American Community Survey] both use a stock-based weighting methodology. They also take account of various aspects of sampling methodology in assigning weight to each unit in a sample. Ultimately, though, the weighted total number of housing units in each survey is forced to equal an independent estimate of the total number of units in the US housing stock. That estimate is produced by the Population Estimates Program (PEP), a separate department at the Census Bureau. The number of occupied units – and so the number of households – is essentially derived by applying the survey's estimated vacancy rate [sic; occupancy rate] to the PEP's estimate of the total housing stock. As a result, the estimate of the housing stock is itself a key component of the estimated number of households.” See Daniel McCue, George Masnick, and Chris Herbert, *Assessing Households and Household Growth Estimates with Census Bureau Surveys*, Joint Center for Housing Studies of Harvard University, W15-5, July 2015.



housing unit occupancy rate. Between the third and fourth quarters of 2014, the HVS occupancy rate increased by nearly a full percentage point, the largest quarterly increase in the 50-year history of the series (see Exhibit 1).

Exhibit 1. The HVS Housing Unit Occupancy Rate Has Been Trending Up, But Spiked in Q4 2014



Source: U.S. Census Bureau, Housing Vacancy Survey.

During the four years prior to the late-2014 jump, the HVS occupancy rate had not changed by more than 0.4 percentage points in any single quarter and had increased by an average of less than 0.1 point per quarter.⁵ Had the occupancy rate increased by this average amount during the fourth quarter of 2014, year-over-year household growth in that quarter would have been only 736,000 – far below the nearly 2 million leap actually estimated in the HVS.

...Before Plunging Back to Earth in 2015

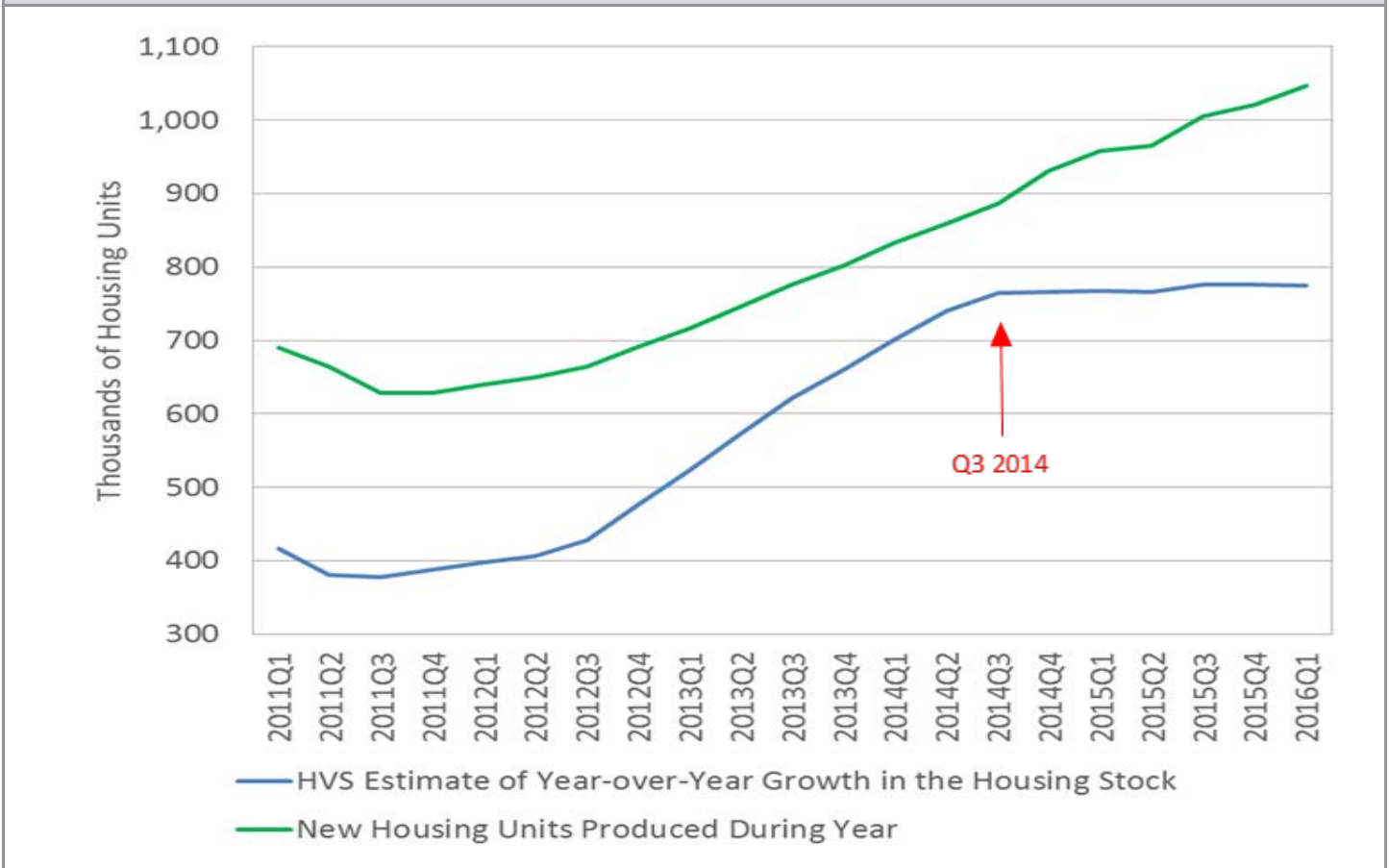
The late-2014 spike in the HVS household formation estimate generated excitement that pent-up Millennial housing demand was finally being released, and that the housing market recovery was shifting into higher gear. Optimism was short-lived, however, as HVS annual household growth estimates gradually receded from the Q4 2014 high, and then suddenly plummeted to less than half a million in the fourth quarter of last year.

⁵ According to Census Bureau staff, no data collection or tabulation changes were implemented at the time of the Q4 2014 jump in the HVS housing occupancy rate, other than the continuation of a gradual phase-in of a new survey sample. Some analysts believe that introduction of the new sample might have been related to the 2014 increases in HVS occupancy rates and household formation. (See Tom Lawler's posting on the Calculated Risk blog on April 6, 2016: "Yellen on Household Formations 'Not Keeping Up;' What Is Her Data Source?" <http://www.calculatedriskblog.com/2016/04/lawler-yellen-on-household-formations.html>). Others point to the HVS' sample size and its lack of conformity with decennial census household counts as reasons for skepticism of its household growth estimates. (See Will Randow, Scott Schrier, and Kenneth Ling, "Delving into the Housing Vacancy Survey", *Citi Research – North America Homebuilding*, April 28, 2016.)



One reason for the household formation retreat was that HVS estimates of the housing unit occupancy rate flattened at around 87 percent after the Q4 2014 surge (see Exhibit 1). But another reason is that the housing stock estimates used in the HVS, which are the other key component of HVS household estimates, have not been increasing very rapidly. Since Q3 2014, growth in the housing stock has flattened at about 770,000 units per year, but new housing production (i.e., single-family and multifamily housing unit completions and manufactured home shipments) has continued to accelerate from 900,000 units per year to more than 1 million units (see Exhibit 2).⁶ Because the HVS housing occupancy rate has stagnated over the past year, and because the independent housing stock estimates aren't increasing very rapidly, HVS-based estimates of household growth have dropped substantially in recent quarters.

Exhibit 2. Estimates of Housing Stock Growth and Housing Construction Have Been Diverging Since Q3 2014



Source: U.S. Census Bureau, Housing Vacancy Survey and Survey of Construction; Institute for Building Technology and Safety, Shipments of New Manufactured Homes. Note: New housing units produced equals the sum of new privately owned housing units completed and new manufactured home shipments.

Alternative Estimates Suggest that Household Growth Remains On a Gradual Ascent

The preceding sections showed that recent HVS household growth estimates are based on two underlying components – occupancy rates and housing stock estimates – that have exhibited puzzling behavior during the past two years. By

⁶ Growth in the housing stock is less than the number of units added via new construction because units are lost from the existing stock due to natural disasters, demolitions, and other factors.

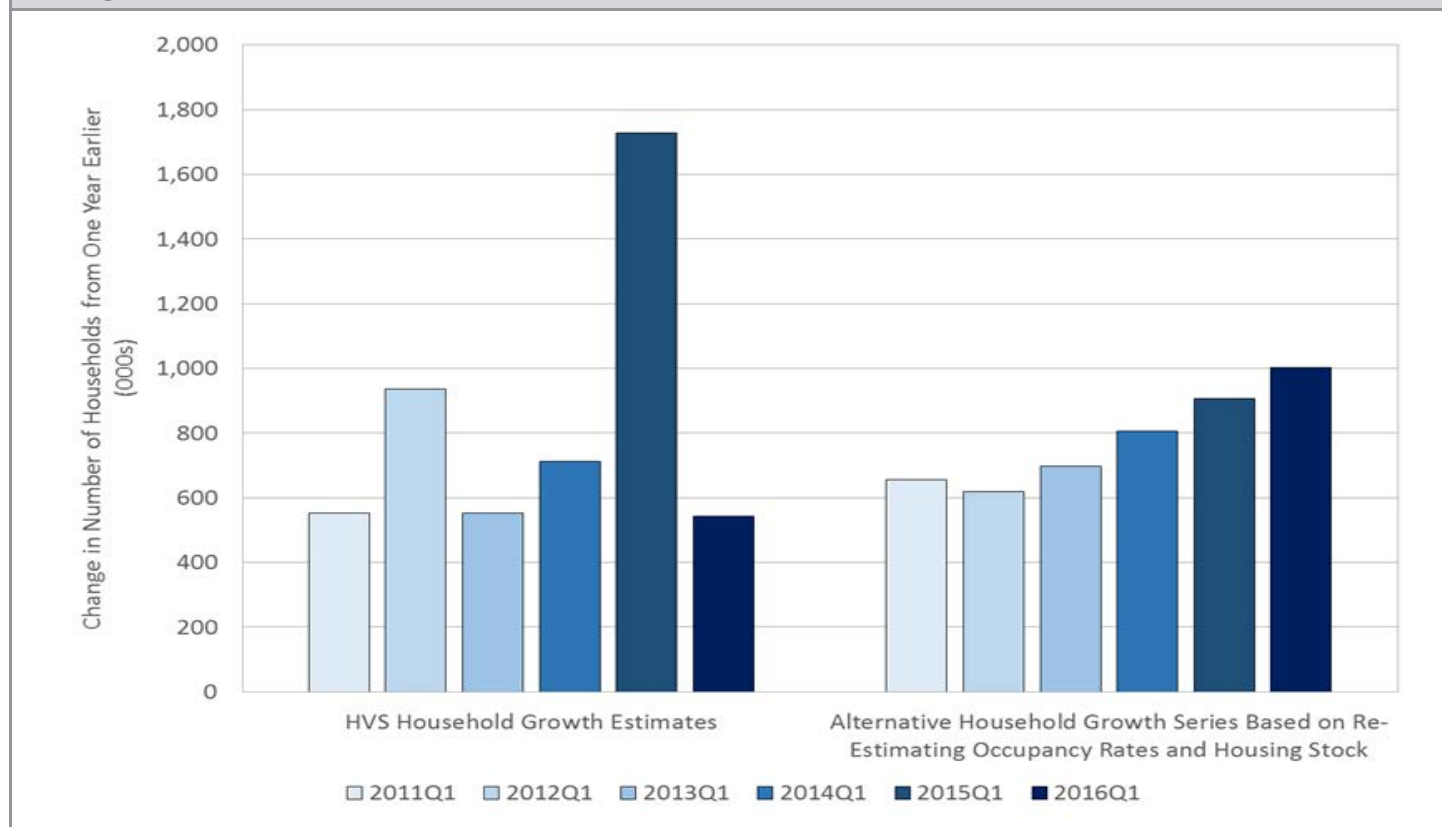


addressing these recent anomalies, we can produce an alternative household formation series. For this *Housing Insights*, we developed an alternative household growth series by smoothing the volatility in the HVS' occupancy rate data and by creating a new set of housing stock estimates that are built up from new housing construction data (green line in Exhibit 2) and estimates of net removals from the existing housing stock. The methodology is described more fully in the Appendix.

The alternative household growth series and the HVS estimates are presented in Exhibit 3. The left panel of Exhibit 3 shows the bounce in HVS-estimated household growth between Q1 2014 and Q1 2015, which was driven largely by the jump in the housing occupancy rate in the fourth quarter of 2014. The HVS data also show household formation plummeting in the latest year, falling to a level not far above the lows witnessed during the Great Recession.

The alternative series, on the other hand, shows a gradual acceleration of household growth beginning in 2012 and continuing through last year (see right panel of Exhibit 3). The alternative estimate of roughly 1 million households added during the most recent year is consistent with estimates from other researchers that are based on different methodologies.⁷

Exhibit 3. Alternative Household Growth Series Suggests Gradual Acceleration Rather Than Wild Swings



Source: U.S. Census Bureau, Housing Vacancy Survey; Fannie Mae Economic & Strategic Research estimates.

⁷ Jed Kolko uses a population-based methodology to estimate that recent household formation is in the range of 900,000 to 1.15 million. He develops this estimate by applying headship rates (i.e., the proportion of the population in a given age group that is the head of a household) from the Census Bureau's Current Population Survey to Census Bureau population estimates. See Jed Kolko, "New Census Report Lowballs Household Formation," January 28, 2016 (<http://jedkolko.com/2016/01/28/new-census-report-lowballs-household-formation/>). Shan and Struyven's recent review and analysis of household growth estimates from multiple federal data sources concluded that household growth likely exceeded 1 million in 2015. See Hui Shan and Daan Struyven, "Household Formation Close to Normal," Goldman Sachs Economic Research, *US Daily*, April 5, 2016.



Conclusion

The Census Bureau's HVS provides fundamental, timely information on the U.S. housing market that is unavailable from any other source. However, the HVS data, like information from any other source, have limitations that could lead to misguided conclusions about the health and direction of U.S. housing markets. In the case of recent HVS-based estimates of household growth, these limitations have given quite a few housing market observers a bad case of data-driven whiplash.

The alternative estimates of household growth presented in this *Housing Insights* should temper some of the late-2014 enthusiasm and allay some of the more recent concerns over the trajectory of household formation. They suggest that recent trends in household growth are consistent with a gradual, albeit frustratingly plodding, housing market recovery.

APPENDIX: Methodology for Producing an Alternative Household Growth Series

The alternative household growth series is developed in four steps. First, linear regression is used to smooth the HVS housing unit occupancy rate series, while still capturing the underlying upward trend. The result, which is shown by the dotted line in Exhibit 1, yields a steady increase in the housing occupancy rate of just under one-tenth of one percentage point per quarter during the last several years.

Second, an alternative housing stock series is created from data on new housing units produced and estimates of net losses of units from the existing housing inventory.⁸ Estimates of new housing production are the sum of new privately owned housing units completed from the Census Bureau's Survey of Construction plus new manufactured home shipments from the Institute for Building Technology and Safety. Estimates of net losses of units from the housing inventory are produced by applying housing-type- and age-specific annual loss rates to estimates of the distribution of the stock by these characteristics.⁹

Third, estimates of the total number of households are developed by multiplying the housing stock estimate by the smoothed housing unit occupancy rate.

Finally, the alternative household growth series is created by calculating the difference between total household estimates at different points in time.

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⁸ The housing stock at the end of any given period is equal to the stock at the beginning of the period plus new housing units produced minus net losses from the housing inventory during the period. The net loss component represents the sum of housing unit demolitions, losses from fires and natural disasters, combinations or subdivisions of existing units, and conversions of structures to and from residential use.

⁹ Net loss rates by housing unit type and age are adopted from the 2015 housing unit estimation methodology document from the Census Bureau's Population Estimates Program (<http://www.census.gov/popest/data/housing/totals/2015/index.html>). The distribution of the housing stock by housing unit type and age is derived from the Census Bureau's American Community Survey.

As a check on the stock loss estimation methodology described above, a second approach developed a long-term total annual stock loss rate based on the difference between housing stock growth as reported in the 1980 and 2010 Censuses and new private housing production during the same period. This annual loss rate was assumed to remain constant between 2010Q1 and 2016Q1. This second approach to estimating housing units lost from the stock produced a household growth series similar to the alternative series shown in Exhibit 3.



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