

BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM
DIVISION OF RESEARCH AND STATISTICS

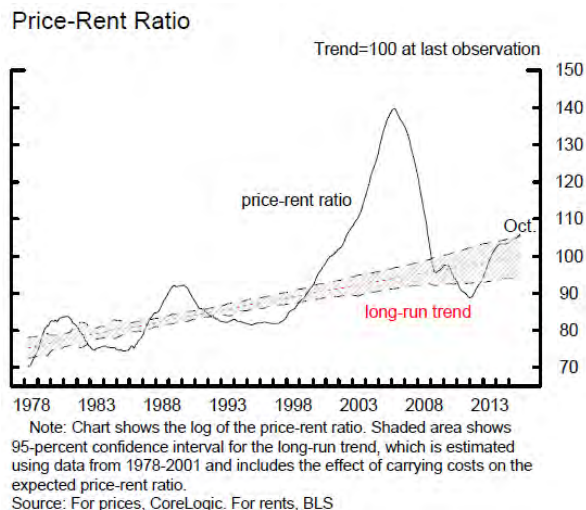
Date: January 8, 2016
To: David Wilcox
From: Steve Laufer
Subject: Staff Assessment of Housing Overvaluation

Overview

This memo describes the staff's approach to measuring overvaluation for residential real estate. Our current assessment is that house prices are only slightly elevated with respect to their historical relationship with rents and that a significant downward correction in house prices is unlikely.

Comparing Prices and Rents

House prices have climbed rapidly in recent years with several leading indexes rising to within 10 percent of their 2006 nominal peaks. In measuring the degree to which house prices seem overvalued, the staff's preferred approach is to consider the ratio of house prices to rents, analogous to the price-dividend ratio for equities.¹ In the figure below, we show the ratio of prices, as measured by the CoreLogic House Price Index, to rents, as measured by the BLS's Consumer Price Index for rent of primary residence.



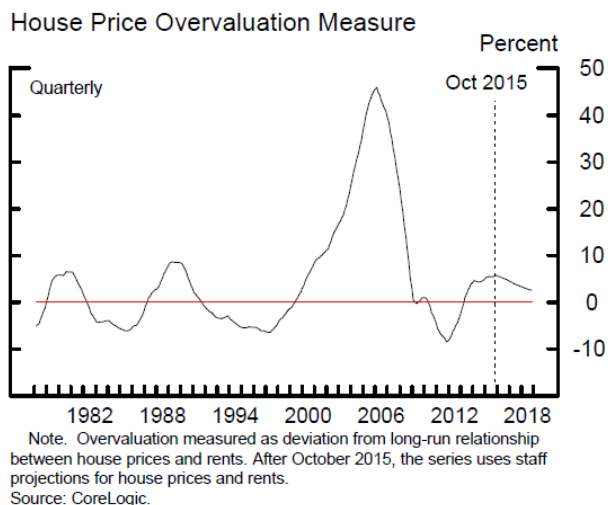
¹ For an empirical study of the relationship between house prices and rents, see Gallin (2008), "The Long-Run Relationship between House Prices and Rents," *Real Estate Economics*, vol. 36, no. 4, pp. 635-658.

We observe two patterns in the historical relationship between prices and rents. First, the price-rent ratio has generally increased over time. There are several reasons that could explain the existence of such a trend. For example, a gradual shift in the location of owner-occupied properties towards locations with more rapid price growth would produce a trend in the ratio (absent a similar shift in the location of rental properties). Also, the measures of both house prices and rents imperfectly control for changes in the quality of housing units. In particular, by measuring changes in the prices of the same units across time, both measures implicitly ignore the effects of depreciation and improvements, both of which are generally unobserved. If owner-occupied properties are renovated more than rental properties or experience less depreciation, then the price of owner-occupied housing would tend to rise relative to rents.

In estimating the long-run relationship between prices and rents (the red line in the figure on the previous page), we include both a linear time trend and adjustments for the effect of changes in the costs of homeownership, such as mortgage rates, property taxes, and the size of the tax deduction for mortgage interest payments. As expected, higher carrying costs for homeowners decrease the demand for homeownership and generate lower price-rent ratios, though the estimated effect is small. (We estimate this relationship using changes at a quarterly frequency—if the long-run correlation is larger than the correlation at the quarterly frequency, it is possible that the gradual decline in these costs since the early 1980s could have contributed to the long-term rise in the price-rent ratio discussed above.)

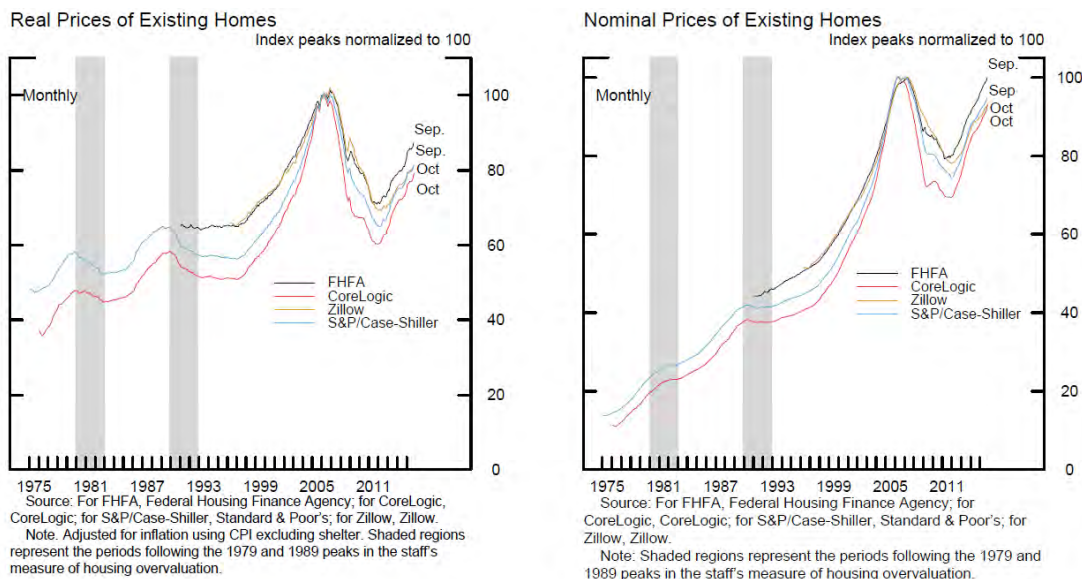
Measuring Housing Overvaluations

The difference between the price-rent ratio and our estimate of its long-run trend is the staff’s preferred measure of house price overvaluation (below). Using this measure, we estimate that prices are currently overvalued by approximately 7 percent, similar to the peaks in this series reached in 1979 and 1989.



In both of these previous instances, house price growth subsequently slowed and real house prices did decline somewhat (as shown in the shaded regions in the left-hand figure on the top of the next page). However, in neither case was there any significant drop in nominal prices (top of next page, right). Current valuations remain well below the 2006 peak, when prices were overvalued by 45 percent and subsequently plunged. Therefore, comparing the current situation to previous episodes, we would

expect nominal house prices to decelerate over the next few years, as they did in the early 1980s and 1990s, but not to fall as they did in the late 2000s.



It is important to note that the staff's measure of housing valuation depends on our estimate of the long-run trend in the price-rent ratio. Based on the amount of uncertainty in our estimate of this trend (the shaded region in the figure on the first page), our measure is consistent with valuations being as high as 13 percent above their historical levels.² An overvaluation of 13 percent would be high by historical standards but still well below the 2006 peak. If we were to ignore the trend and instead compare the price-rent ratio to its average level over the pre-boom period, we would conclude that prices are currently about 25 percent above their historical average. However, as described above, there are several reasonable explanations for the trend. Regardless, because the price-rent ratio has exhibit a pronounced trend for nearly 40 years, it seems unlikely that it will return to its historical average during the projection period.

Regional House Prices

The conclusion that house prices are slightly overvalued is consistent with data for 22 metropolitan areas for which we have sufficiently long history of both CoreLogic house prices and BLS rents.³ The figure on the next page compares the price-rent ratios in these metropolitan areas to their historical averages.⁴ In 10 of these 22 areas, we estimate that house prices are either undervalued or are overvalued by less than 10 percent (the green and blue regions). In only 4 of these metropolitan areas do house prices appear to be more than 20 percent above their historical levels compared to rents (the

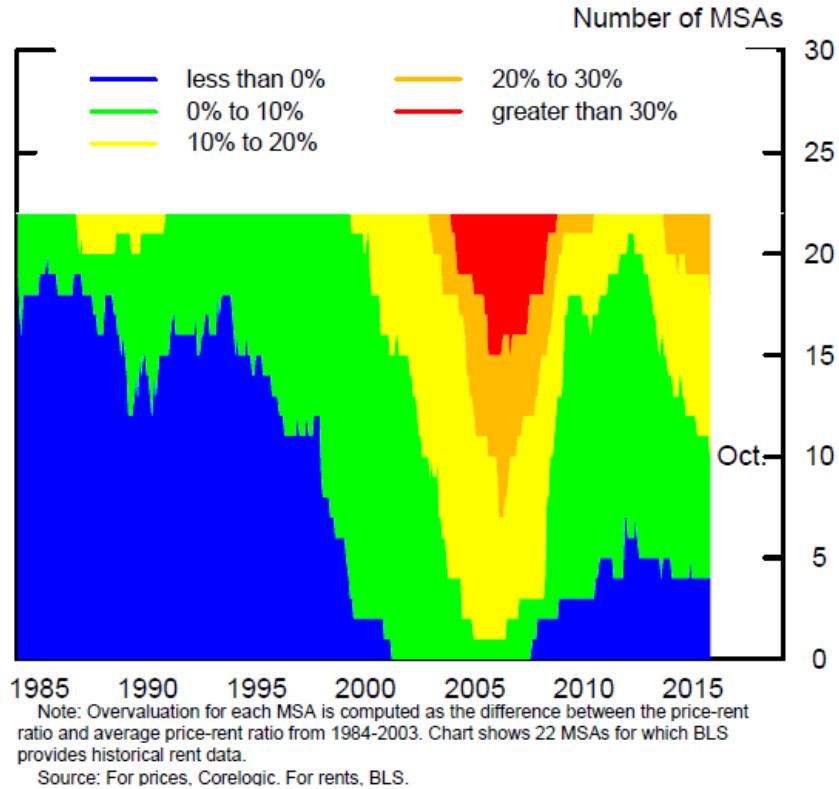
² This upper bound can be computed as the difference between the price-rent ratio and the bottom of the shaded region, which shows the uncertainty around our estimate of the long-run trend.

³ These 22 metropolitan areas contain approximately 40 percent of the nation's housing units.

⁴ Because there is not as much history available for the regional measures, we do not estimate long-run trends for the regional price-rent ratios as the uncertainty around such estimates would be large. The price-rent ratios in many MSAs do appear to have positive trends so including these trends in the analysis would tend to lower our estimates of housing overvaluation.

orange region). This distribution is comparable to that seen in 2003. Finally, in none of these metropolitan areas do prices appear to be overvalued by more than 30 percent (the red region), as they were in several metropolitan areas in the years leading up to the 2006 peak.

Distribution of MSA Overvaluations



House Prices in the Staff Projection

Looking ahead, we project that prices will continue to rise through the medium term, though at a slower pace than we have seen over the past two years. Meanwhile, we expect that rents will continue to rise briskly, so that the ratio of prices to rents is expected to decline modestly, bringing the price-rent ratio closer to its historical average. This projection is consistent with the tendency for house prices to exhibit strong momentum in the short run and mean reversion over longer periods. As always, there remains considerable uncertainty around our forecasts and turning points in house prices are especially difficult to predict. However, the analysis presented above suggests that a substantial decline in house prices during the projection period is unlikely.