Projecting Changes Home Prices

Light at the end of the Tunnel

RANGEMARK

September 2009

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Light at the End of the Tunnel?

After having dramatically under-predicted the fall in housing prices in 2007, many researchers and analysts now forecast steep and perpetual declines in HPA, or cessation of the falling trend only in the event of a strong economic rebound. It is our belief, however, that we have reached the trough and look forward to the return the natural upward trend in average house values.[1] After falling for eleven consecutive quarters – house prices 38% lower on average than their peak in Q3 2006— the fundamentals for a rebound, if tepid, have now coalesced. Does this signal the end of mortgage loan defaults and widespread upgrades for troubled RMBS? No… The damage has been done with respect to expected defaults on loan pools originated at the height of the bubble. However, stabilization will serve to give lenders and investors some confidence in their analysis and outsized *liquidity premium* embedded in prices of down-graded legacy assets will likely evaporate. What are the key factors that effect house prices and what gives us confidence the worst is over?

HPA and Mortgage Credit Modeling

HPA is one critical variable in loan performance forecasting models. Consider an individual borrower. Let's say he pledges his house worth $200,000 against a loan $180,000. The value of his house subsequently falls to $160,000. Notwithstanding concerns over shelter replacement or the impact on his FICO score, it is in this borrower's economic interest to hand over the keys to his home rather than continuing to make payments. In fact, the statistical relationship between HPA and loan performance is quite strong and stable. To the extent RangeMark under-predicted delinquencies or defaults over the past three years, errors were almost entirely due to not-bleak-enough HPA forecasts. For purposes of developing our current baseline national HPA forecast we made four studies.

1) Affordability Effect - relating home price to trends in Personal Income.
2) Trend Reversion - review of historical HPA index movements (FHFA and S&P Case-Shiller)
3) Futures Market as Predictor - near-term HPA forecasts implied by CME contract.
4) Econometric Model - developed a statistical regression model for national HPA movement.

Summary of results: The studies combine to suggest the period of rapid home price decline is over, and modest home price appreciation over the near to medium term can be expected, largely due to the tremendous change in housing affordability.

Affordability

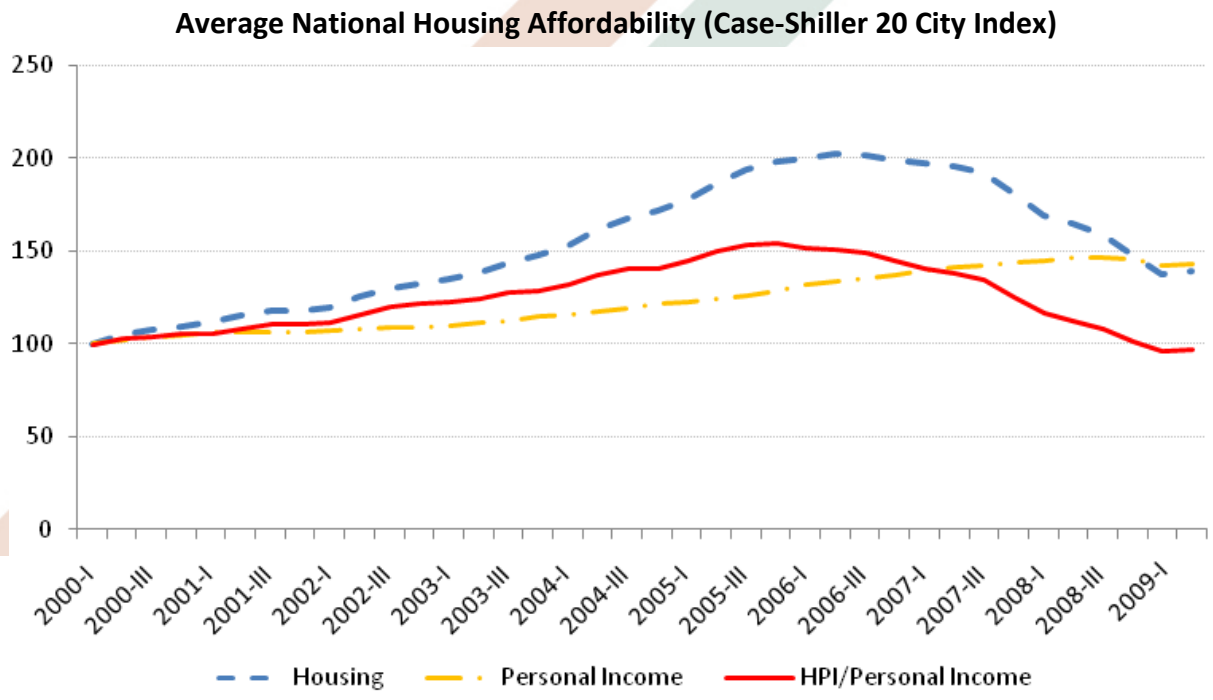
During the 2002-2006 period, home prices increased much more rapidly than incomes, causing homes to become far less affordable. From 2002 through the second quarter of 2008, nominal Personal Income rose steadily at a 4.95% average annual rate. From the third quarter of 2008 through the first quarter of 2009, nominal Personal Income fell 2.8%, resuming positive growth in the second quarter of 2009. The crash in housing prices that began as a modest slide in 2006 but accelerated dramatically and continued to slide through the second quarter of 2009, resulted in a significant realignment of housing prices relative to incomes.

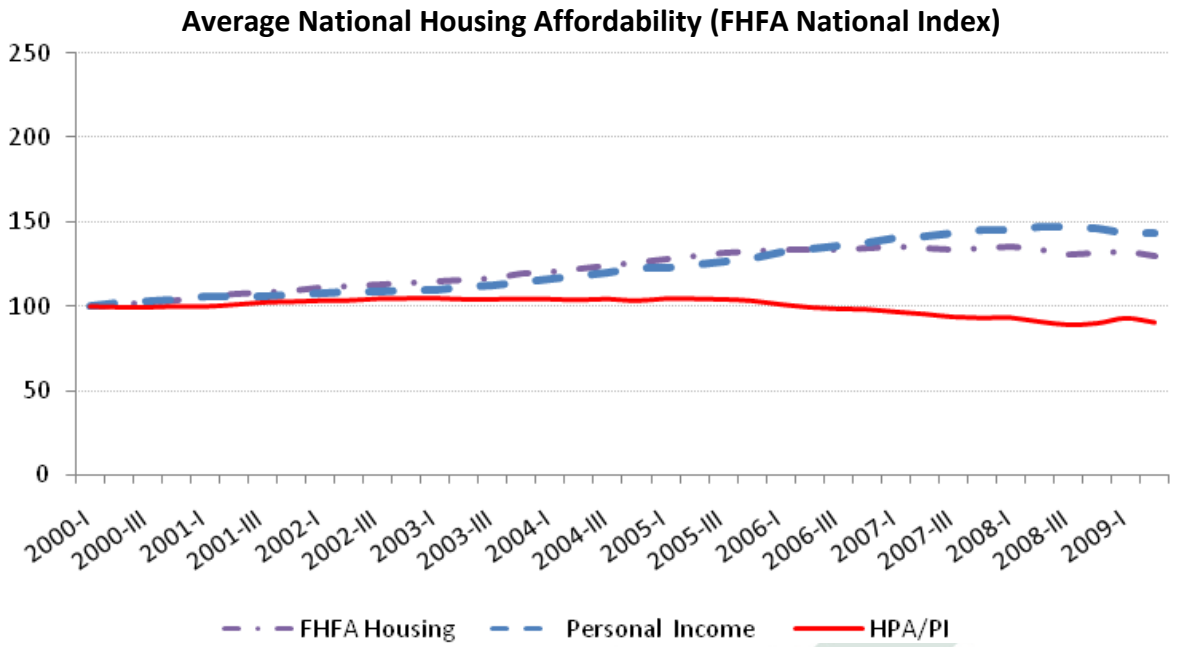
[1] J.P. Morgan predicts further 13% and 9.3% declines in the Case-Shiller and FHFA national averages respectively. (*July 2009 Home Price Update*, J.P. Morgan Securities, September 9, 2009)

The two most popular indicators of national home price change are the S&P Case-Shiller 20 City Index and the home price index prepared by the Federal Housing Finance Agency. Both measure price change using same-home resale data to control for home quality. The scope of the Case-Shiller index is both narrower and broader. It is narrower than the FHFA index because it uses only price changes from large urban centers. It is broader in that the FHFA index uses information connected only with purchases financed by Fannie Mae and Freddie Mac conforming conventional mortgages.

For purposes of this report, affordability is measured simply as the value of the home price index divided by a Personal Income index created by making the aggregate Personal Income as reported by the Bureau of Economic Analysis as of some start date a numeraire and dividing subsequent reported values by such numeraire.

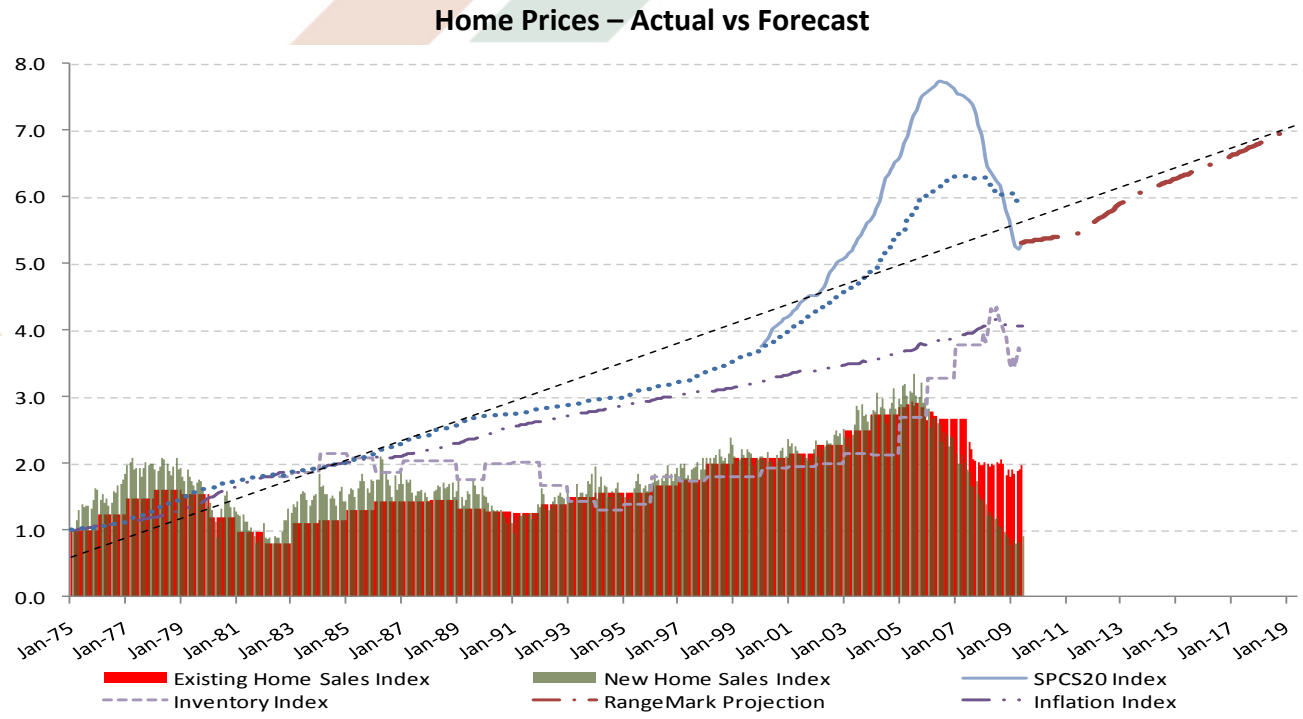
The Case-Shiller series begins in 2000 and is more volatile than the FHFA series. From the beginning of 2002 through the middle of 2006, average home prices, as measured by the Case Shiller index, grew at an average annual rate of 12%. The following 3 years, home prices fell at an 8.6 % average annual rate. By mid-2009, the movement of home prices as calculated by Case-Shiller, relative to the movement of Personal Income had created a condition in which average affordability in the 20 large cities that comprise the index had become better than at any time in the history of the index. The FHFA series shows affordability was essentially stable until 2006 when rising personal income combined with falling prices to make housing dramatically more affordable.





HPA MOVEMENTS AND THE HISTORICAL TREND

It is useful to consider home price trends in an historical perspective. In the graph below, the FHFA and Case-Shiller 20 city indices are plotted against inflation (the Consumer Price Index), and indices of home sales and inventories. To illustrate co-movements during the bubble-crash epoch, the Case-Shiller index that starts in 2000 was calibrated to start at the same level as the FHFA index. Using thirty-four years of FHFA home price data, the average annual rate of growth of home prices over the period was 5.2%; the average annual inflation rate was 4.1%. Regressing the FHFA levels on time creates a trend for indexed home prices. This is portrayed on the graph below by the black dotted line.



CME Implied Near-Term Case-Shiller Forecasts

The Chicago Mercantile Exchange created a futures contract based upon S&P Case-Shiller home price index designed to enable participants to hedge or speculate on housing prices. Contracts are offered on 10 individual city indices and the 10 city Case-Shiller composite. Although transaction volumes are thin, quotes give an indication of investor forecasts for near-medium term HPA trends. On September 29, the latest 10 city index was for month-end July was 155.85. The futures quote stack at end of the day was:

November 2009	158
February 2010	155
May 2010	157
August 2010	159
November 2010	160

The forecast implied in these quotes a modest positive price appreciation of approximately 3% over the course of the next year.

Econometric Model of Home Price Changes

For the econometric model, the dependent variable is the percentage change in the Case-Shiller 20 city index. There are four independent variables: 1) real interest rates, 2) vacancy rate (from the Census Bureau, the proportion of the US housing stock vacant for other than temporary reasons), 3) percentage change in real Personal Income, and 4) percentage change in the number of households. The vacancy rate captures supply effects while real income, real interest, and household growth capture demand factors.

Goodness of fit statistics are remarkably strong. The R-squared is 0.84, high considering no auto-regressive terms are used and the relationships are specified for change rather than levels. The F-statistic is 42, and the t-statistics for the explanatory variables are high except for the household variable. Even for the household variable t-statistic is greater than 1, implying that introducing this variable serves to raise the adjusted R- squared. The Durbin-Watson score of 1.36 lands in the indeterminate zone, meaning the hypothesis of the presence of autocorrelation cannot clearly be accepted or rejected. This outcome is not unusual for specifications estimated with time series data.

The model tracks history quite well. As illustrated in the graph below, it "predicted" the peak growth rate to the quarter, the trough growth rate to the quarter, and led the turning point (when HPA changed from positive growth to negative) by only one quarter. High real interests forced HPA change from its peak growth rate in 2005 and a rapidly rising vacancy rate pushed HPA change deeply into negative growth throughout 2006 and 2007.

The model captures the timing, though underestimates the preliminary trough in HPA growth rates that occurred in the first quarter of 2008. Rapidly falling real interest rates in the first three quarters of 2008 helped temper briefly the rate of home price declines.

A sudden jump in real interest rates associated with a rapid general decline in prices in the forth quarter of 2008 and first quarter of 2009 brought a sudden reversal of the improving trend, forcing home prices sharply lower. The recovery in the second quarter has been supported by a rapid decline in the vacancy rate and an end to deflation, with an associated decline in real interest.

In-Sample and Forecasted Changes in Home Prices

The reported positive growth rate for the Case-Shiller index in June, July, and August support the expectation of a modest growth rate for home prices in the third quarter. Using estimates of real interest rates, Personal Income growth, and Household Formation based on data already available and applying the trend in the vacancy rate over the last two quarters, the RangeMark model generates a forecast of very modest positive growth for home prices for the third quarter.

Regression Statistics	
Multiple R	0.91789104
R Square	0.842523961
Adjusted R Square	0.822839456
Standard Error	0.01399674
Observations	37

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	0.03354	0.00839	42.80138	2.07115E-12
Residual	32	0.00627	0.00020		
Total	36	0.03981			

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.09552	0.03520	2.71350	0.01063
Real Interest Rates	-0.00277	0.00094	-2.93900	0.00607
Vacancy Rates	-0.05657	0.00508	-11.13663	1.52717E-12
% Δ Personal Income	0.87614	0.33432	2.62062	0.01332
% Δ Households	14.65128	13.65258	1.07315	0.29123

Currently, real interest, Personal Income growth, and the rate of Household Formation are all below historical trend while the vacancy rate in the US housing stock is still well above its pre-bubble norm. It is reasonable to expect real interest, real income and household formation to be pro-cyclical. Vacancy rates should be countercyclical but the current foreclosure overhang suggests a rapid movement to historical norms cannot be expected to continue much further.

Using a very slow projection of the pro-cyclical variables from their current levels to their historical trends over the next two and half years (consistent with a scenario of slow and weak recovery) and a small drop and then stagnation in the level of the vacancy rate over the same period, combines to generate a forecast of 3-4% annual growth for home prices from the beginning of 2010 through early 2012. This projection is consistent with the CME futures quotes.

To be conservative for purposes of credit modeling, RangeMark is now using for its baseline scenario a growth rate of 1.13% per annum for a two-year period before returning the projection to historical trend line growth. The key risk to the forecast is the trend in the vacancy rate that may be affected by changes in the rate of repossessions. A mitigating factor to the foreclosure overhang that will likely keep vacancy rates from returning to historically high levels is the unusual affordability of homes that was been created by the price trend over the last two years relative to the trend of income.

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