Moody's ANALYTICS

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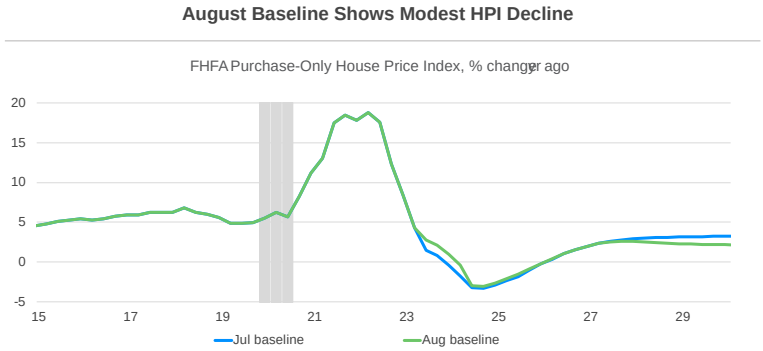
Housing Market Scenario Update: A Theory of House Prices

Lack of available homes is propping up U.S. house prices as high mortgage rates weigh on affordability.

- House prices have moved upward in recent months as the inventory of homes available for sale fell to near record lows.
- But high mortgage interest rates will limit the pool of potential buyers, causing price growth to moderate or fall in parts of the country.
- Here, we summarize the broad underpinnings of our econometric model of house price growth and tie the model to current market conditions.

The August edition of the Moody's Analytics baseline scenario featured a modest increase in the short term outlook for U.S. house prices with a peak-to-trough decline of 4.5% versus 5% in previous months.



Sources: FHFA, Moody's Analytics

While house prices have moved upward in recent months as the inventory of homes available for sale fell to near record lows, high mortgage interest rates will limit the pool of potential buyers, causing price growth to moderate or fall in parts of the country. The outlook can best be described as a modest correction rather than a crash as occurred during the Great Recession. To help users of our scenarios better understand our rationale, we summarize the broad underpinnings of our econometric model of house price growth in the sections that follow. In the final section we tie the model to current market conditions.

Estimating equilibrium house prices

The specification of our econometric model for house price growth is motivated by the idea that the price of a house can be deconstructed into two fundamental parts: the value of the structure and the value of the land underneath it. Given this framework, equilibrium annual house price growth equals the weighted sum of the growth of construction costs and the growth of land prices. Under the assumption that land is ultimately developed for its best and most productive use, land prices can be reasonably expected to grow at the rate of nominal gross domestic product or personal income when the economy is growing at its potential with full employment and stable interest rates.

$$\% \Delta HPI = \alpha * \% \Delta \text{construction costs} + (1-\alpha) * \% \Delta \text{GDP/income}$$

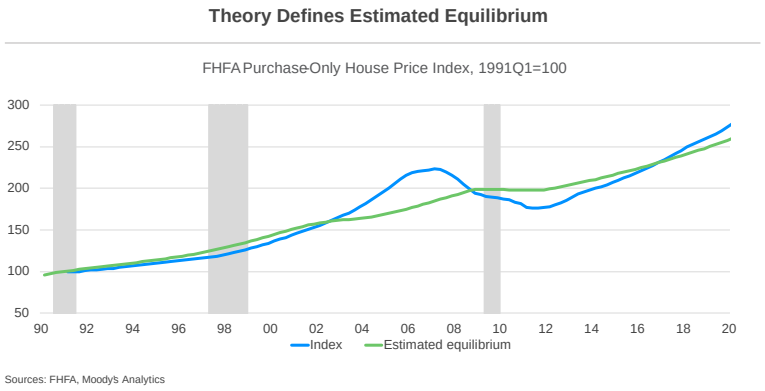
The relative weights on the growth of structure (α) and land (1-α) values varies considerably across the country with areas that are landlocked or with strict zoning regulations that inhibit development such as San Francisco having a higher relative weight on the growth of land values. Areas where land is abundant or with fewer restrictions on development such as Pittsburgh have a higher relative weight on construction costs.

Weights for the U.S. as a whole are roughly balanced at 50% for both structure and land values. Assuming construction costs grow at their historical average of 2% to 3% and nominal GDP/income grows at 4% to 5% then house prices would be expected to grow at approximately 3% to 4%. (Supporting this claim, we note that the FHFA purchase-only index grew at 3.7% on average from 1975-2020.)

This theoretical construct forms the basis for the first stage of our error-correction model employed to forecast house prices. We estimate the historical relationship between house prices, income and construction costs as follows. Demographic shifts are accounted for by normalizing by population.

$$\text{FHOFHOPIPOTQ\_US} = \exp\left(\beta_1 * \log\left(\text{@MOVAV}\left(\text{FYPEWSQ\_US} / \text{FPOPQ\_US}, 12\right)\right) + \beta_2 * \log\left(\text{FENRCC\_US}\right) + \beta_3\right)$$

As expected, realized house prices have snaked around the estimated equilibrium consistent with the booms and busts in the housing cycle.



Sources: FHFA, Moody's Analytics

Long-run equilibrium is a useful theoretical construct for understanding where prices may land eventually, but markets are seldom in equilibrium. They're constantly adjusting to shocks both positive and negative as they converge towards an equilibrium. This period of adjustment may be long or short depending on the magnitude of each shock and other factors affecting the economy simultaneously such as high levels of unemployment or shifting interest rates.

For example, house prices boomed during the pandemic as Federal Reserve actions drove mortgage rates below 3% and wide acceptance of remote work incentivized homebuyers to bid up prices nearly 25% above their estimated equilibrium values. Prices declined (or moderated) over the past year as interest rates rose to more than 7% and businesses began to rethink their liberal remote work policies.

We estimate an adjustment equation in the second stage of our house price model to capture these effects. Essentially the objective of this equation is to forecast the path that home prices will take to go from their current levels toward their long-run equilibrium values while accounting for short-term forces and shocks. Specifically, the equation considers recent changes in prices (or the "momentum" of house price growth and construction costs) as well as user costs (including the outlook for mortgage rates and property taxes), the share of distressed properties for sale, and lending standards:

$$\text{DLOG(FHOFHOPIPOQ\_US)} =$$

β_1 +

β_2*LOG(FHOFHOPIPOQ_US(- 1)/FHOFHOPIPOTQ_US(- 1)) +

β_3*DLOG(FHOFHOPIPOQ_US(- 1)) +

β_4*DLOG(FHOFHOPIPOQ_US(- 2)) +

β_5*D(FUSERCOSTQ_US) +

β_6*DLOG(FENRCC_US(- 1)) +

β_7*DLOG(FENRCC_US(- 2)) +

β_8*D(FDISTRESSSHARE_US) +

β_9*D(FXSLASHMQ_US)

An economic shock that led to a sharp increase in unemployment would feed into the forecast predominantly through the last two factors. Rising unemployment would lead to an increase in foreclosures and distressed sales as occurred during the Great Recession. In addition, mortgage lenders would tighten their standards dramatically out of fear of rising losses and the need to preserve capital. The reduction in available credit would limit the number of eligible buyers, further reducing demand and house prices.

The structure of the equation ensures that house prices will return to their equilibrium level conditional on all of these other factors settling into their long-run steady state. Similar equations are estimated at the subnational level to capture local nuances. Some housing markets will adjust more quickly than others depending on how fast their labor markets and populations adjust. Differences in regulations surrounding foreclosures and new construction will also impact the speed and duration of adjustment to a new equilibrium.

The August baseline outlook

The key assumption underlying this house price framework in the current environment is that housing affordability ultimately needs to be restored. This can occur in one of three ways:

1) Interest rates could fall causing monthly mortgage payments to decline.

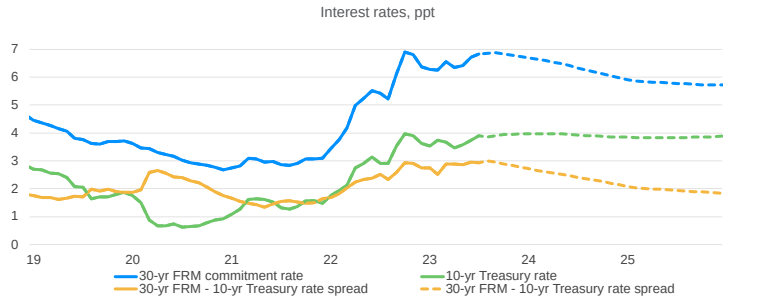
2) Incomes of prospective homebuyers could rise making existing payments more affordable.

3) House prices could fall lowering the balances on new mortgages.

We assume that all three adjustments will be made over the next 12 to 24 months leading to a gradual return to equilibrium in our baseline scenario.

We forecast mortgage interest rates to decline from nearly 7% today to 5.5% to 6% as the mortgage rate spread (the difference between the interest rate on a 30-year fixed rate mortgage and that on 10-year Treasury bond) falls from 300 basis points today toward its pre-pandemic level. The spread is elevated today as investors account for heightened mortgage prepayment risk and interest rate volatility. As financial markets normalize, increased demand from global investors should return the spread closer to its historic level.

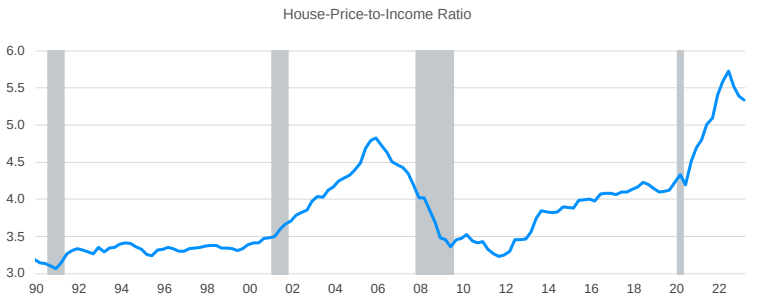
Elevated Mortgage Rates Expected to Ease Slowly



Sources: Freddie Mac, Federal Reserve, Moody's Analytics

Personal incomes are expected to continue to grow by 4% to 5% per year over the next few years assuming the job market remains firm and the economy does not experience a recession. At the same time, the projected 4.5% peak-to-trough decline in house prices over this time will allow the price-to-income ratio to decline to more sustainable levels. Note that while we expect the price-to-income ratio to normalize, we do not expect it to fall all the way back to its pre-pandemic level due to assumed structural shifts in preferences. With more employees working remotely from their homes and individuals placing a higher premium on personal space in the wake of the pandemic, the price-to-income ratio is expected to remain elevated relative to history for the foreseeable future.

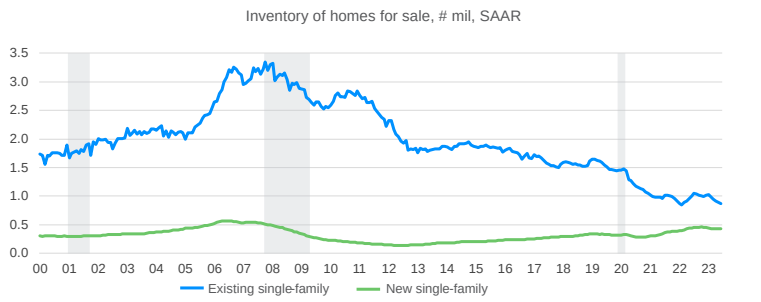
Incomes Need Time to Catch Up With Prices



Sources: NAR, BEA, Census, Moody's Analytics

In the immediate term, the low level of houses available for sale due to the lock-in effect is hampering the return to equilibrium. The sharp decline in interest rates during the pandemic allowed the vast majority of households to refinance their mortgages at ultra-low rates such that more than 90% of borrowers have a mortgage rate below 6% and nearly 70% have a rate below 4% today. As a result, homeowners have no incentive to sell their homes—even if they want to—given the prospect of experiencing a significant increase in their monthly mortgage payments on the next home they purchase.

Lock-In Effect Reduces Number of Homes for Sale

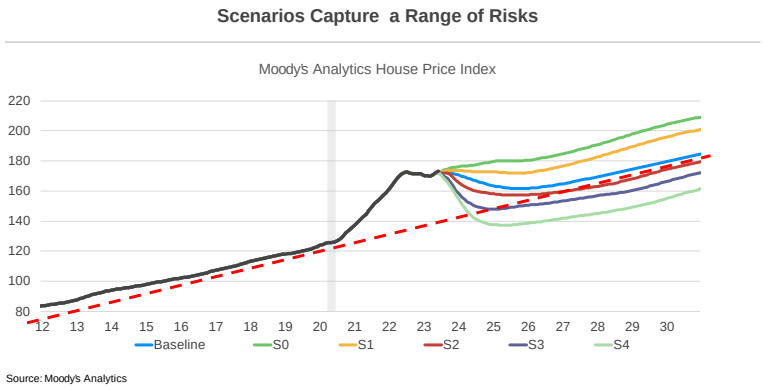


Sources: NAR, Census Bureau, Moody's Analytics

As a result, existing-home sales will remain low in the near term but are expected to rise gradually over time as life events such as the birth of children, divorces, and deaths lead to more home sales. As the inventory of homes for sale rises, prices will gradually adjust downward to restore affordability for the marginal buyer.

The degree of correction in house prices will vary by geography with those areas that experienced higher levels of overvaluation during the pandemic housing boom at greater risk of adjustment than areas that did not experience a house price decline. Other factors such as shifts in preferences for certain areas or styles of homes and higher user costs in the form of higher property insurance premiums will also contribute to variation across markets.

Given the continued strength of the lock-in effect and the low inventory of homes available for sale that has resulted, as well as a marked reduction this month in the odds of a recession over the next 12 months, Moody's Analytics has tempered its outlook for house price declines over the short run in the August update to the baseline forecast. Moody's Analytics now expects that prices will decline 4.5% over the next 18 to 24 months from their current level versus expectations for a 5% decline in July.



Source: Moody's Analytics

Considerable uncertainty surrounds this forecast given the Federal Reserve's commitment to continue raising interest rates until core inflation returns to its long-run target and other economic headwinds. Downside risks include a sharp increase in unemployment causing foreclosures to rise and house prices to fall as a result. However, upside risks are also significant should the lock-in effect prove stronger than anticipated. A persistent lack of inventory available for sale could send prices even higher in the short to medium term. In this case, house price growth would still be expected to moderate in order for affordability to be restored. However, this adjustment may occur over a longer period of time than assumed in our baseline.