Together, you can.

Home Price Appreciation, Interest Rates, and Inflation

Authors:

Matthew O'Hara
Head of Portfolio Management and Research

Michael Tubbs
Quantitative Portfolio Analyst

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Introduction

Owner-occupied residential real estate is the largest asset class in the world and is a foundational piece of the U.S. economy. During the market disruptions of the Covid-19 pandemic, changing consumer preferences, record-low mortgage rates, fiscal stimulus, and other factors drove house price appreciation (HPA) to accelerate at historic levels. Mortgage-backed securities (MBS) and other mortgage-related fixed-income assets tend to perform poorly in rising rate environments, but what happens to home equity? In this paper, we seek to answer the question of what Unison believes will happen to HPA in the current environment of rising interest rates, inflation, and chronic housing supply shortage.

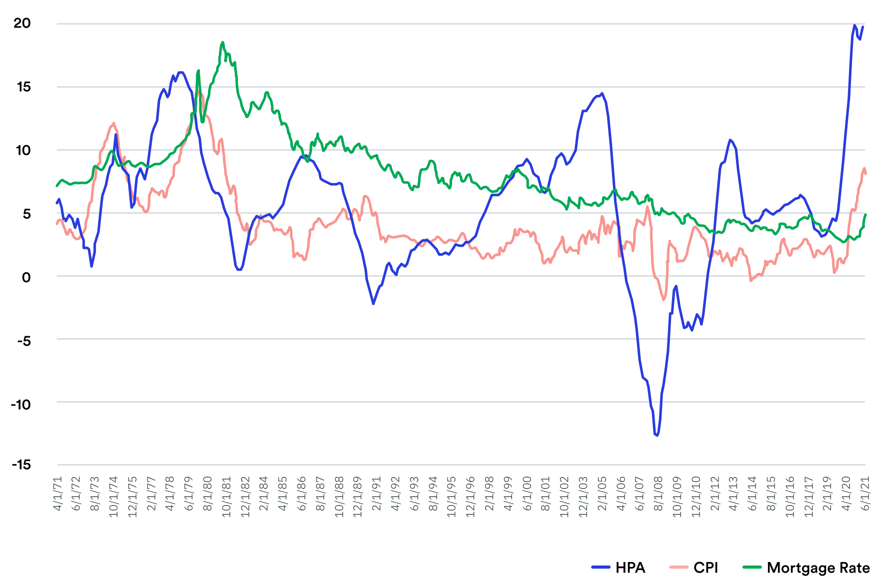
Through an analysis of historical periods and the current environment of high inflation and rising rates, we have found that:

- Generally speaking, there is a low correlation between the 30-year interest rate and HPA, but there is a strong, positive correlation between inflation and HPA
- These macro factors, in conjunction with housing supply and demand, can provide a picture of the future of HPA.
- Growth in housing supply in urban areas is constrained, with no signs of easing.
- Demand has softened from pandemic highs but remains strong by historical standards.

In aggregate, Unison believes that these factors will drive above-average growth in HPA in the medium term with a soft landing to the long-term average of HPA of around 4.5% per year.

FIGURE 1

Historical HPA, Inflation, and Interest Rates



Data: Case-Shiller, U.S. Bureau of Labor Statistics, and Freddie Mac

The Historical Relationship Between Interest Rates, Inflation, and HPA

Due to a confluence of factors, there has recently been significant rising inflation, which deteriorates the real yields investors expect to receive from an asset. Historically, however, there is a tight correlation between house price appreciation and inflation, particularly compared to other asset classes. Perhaps the best example of this trend is during the 1970s when inflation was closest to the levels it is today. Throughout the decade, HPA accelerated with inflation but also mirrored the CPI as policy constricted, providing consistent inflation-protected returns. The 1970s marks the closest circumstance in terms of the rapid price appreciation we are experiencing today, and home prices experienced positive growth during this decade. This can also be seen in the predictive power of inflation in future HPA. As demonstrated by the figures below, current inflation levels are on the x-axis and future home price appreciation is on the y-axis. There is a positive relationship and predictive power of inflation in determining future HPA. Both of these relationships are a testament to the robust nature of the asset class to inflationary pressures. Over time, the running correlation with these series increases as monetary policy stabilizes, and home prices occupy a larger share of the Consumer Price Index (CPI).

FIGURE 2

HPA and Inflation 21st Century

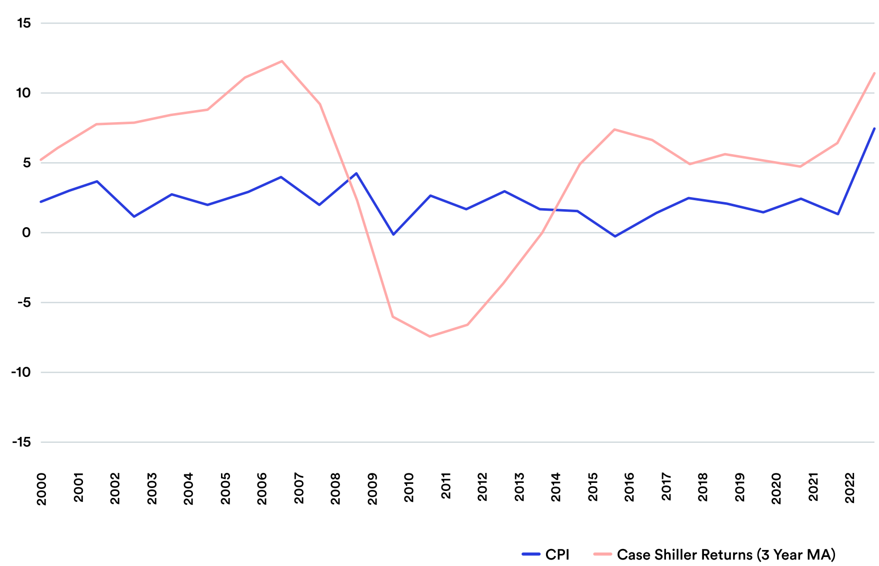
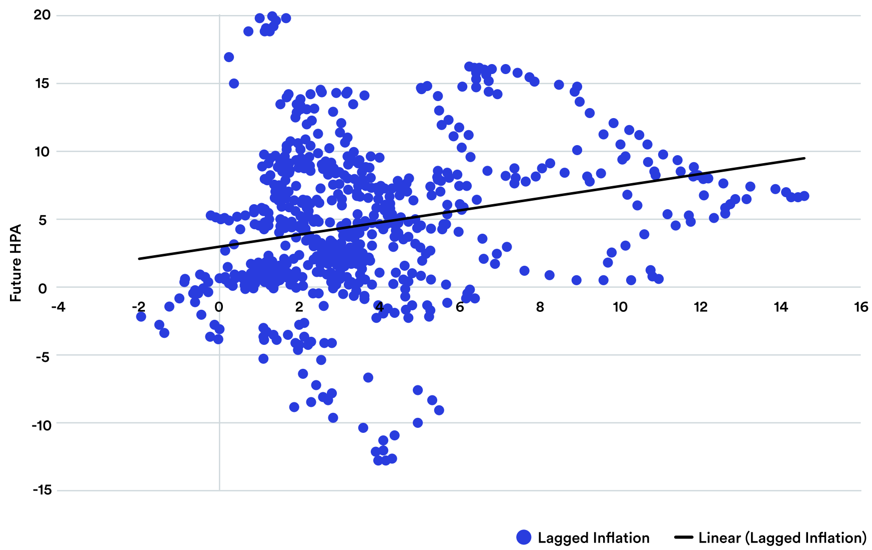


FIGURE 3

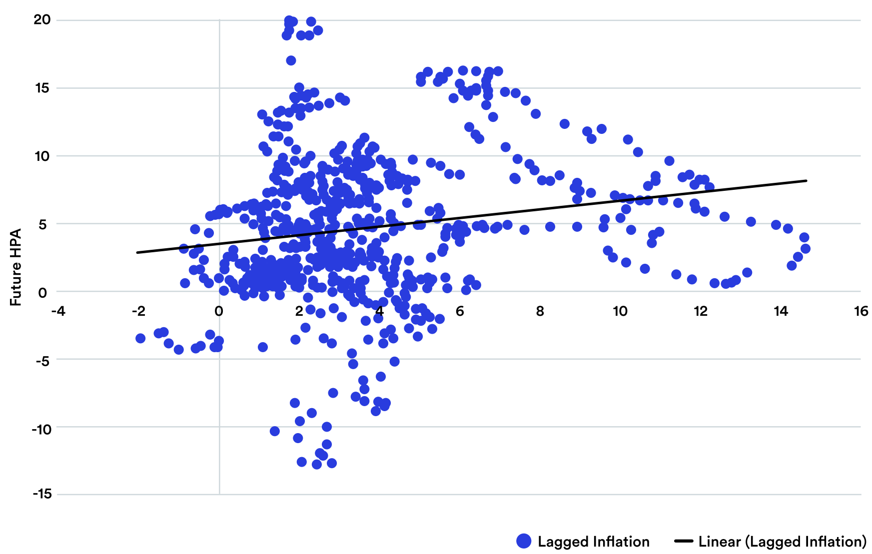
Future HPA based on One-Year Lagged Inflation



Data: Case-Shiller, U.S. Bureau of Labor Statistics

FIGURE 4

Future HPA based on Two-Year CPI Lag



Data: Case Shiller, U.S. Bureau of Labor Statistics

As monetary policy came to rein in inflation under Paul Volcker and transitioned into its modern era under Alan Greenspan, HPA and the CPI have a tighter relationship. The reason for this is two-fold: the first part stems from monetary policy producing more stable inflation expectations which allow homeowners and future homeowners to make more informed decisions regarding their financial future, and secondly, that the share of housing has risen in the CPI since the Volcker era. In January 1975, for instance, housing occupied a little over a third of the share of the CPI. This is a substantial difference from the most recent Consumer Price Index for All Urban Consumers (CPI-U) or The Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) in which housing occupied over 40% of either metric of inflation[1].

In response to seemingly runaway inflation, the Fed has begun to tighten monetary policy by raising the short-term interest rate known as the Federal Funds rate (FFR). Ceteris paribus, or all things equal, a rise in the short-term rate of interest will cause various asset prices to fall. The traditional channel for this is that an increase in the interest rate raises the cost of borrowing, decreases investment levels for either firms or households, and is a negative shock to asset prices. Of course, the difficulty lies in "all things equal." Monetary policy is responding to various shocks and economic variables, and rising rates don't necessarily correspond to lower home prices.

[1] United States. Bureau of Labor Statistics. The Consumer Price Index: Concepts and Content over the Years. [Washington]: The Bureau, 2022.

For example, if the Fed is lagging inflation metrics (as is the case now), the actual cost of borrowing has decreased because the real rate of borrowing is low. Furthermore, there is an interest rate pass-through effect from the Fed Funds Rate (FFR) to a long-term borrowing rate that matters to homeowners: lenders are pricing in future expectations of monetary policy into a 30-year fixed rate so a 50-basis point rise in the FFR could cause a dip–or a spike– in the 30-year rate. Generally speaking, there is no correlation between the 30-year interest rate and HPA. As seen in the figures below, there is absolutely no predictive power of rising 30-year fixed mortgage rates on the future of HPA in both one and two-year horizons.

FIGURE 5

Future HPA based on One-Year Mortage Lag

Data: Case Shiller, Freddie Mac

FIGURE 6

Future HPA based on Two-Year Lagged Mortgage Rates

Data: Case-Shiller, Freddie Mac

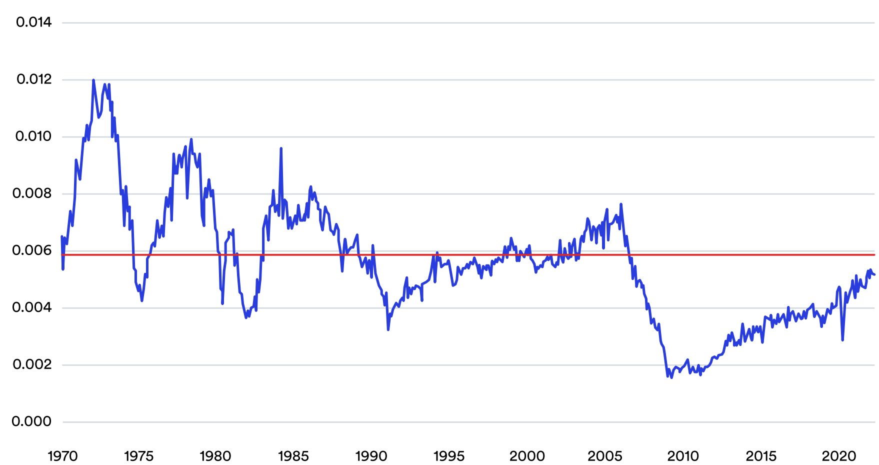
Supply Side Story

For any asset, supply and demand are the fundamental forces shifting those prices, but the U.S. housing supply is in one of the most unique positions. On the surface, there has been substantial growth in permits issued for New Privately-Owned Housing Units since bottoming out during the great financial crisis (GFC) as seen below, but that is far from the whole story. The share of housing permits in comparison to the population, the types of housing permits approved, increasing construction costs, and the lack of rental supply will all put positive pressure on HPA moving forward.

While permits for residential real estate are on the rise, their percentage of the population is well below the long-run average and has not trended particularly favorably. Below is a figure of housing production as a share of the population, and the trend is moving downward over the last four decades. This was exacerbated by the GFC and has nowhere near recovered to pre-GFC levels.

FIGURE 7

House Production per Capita



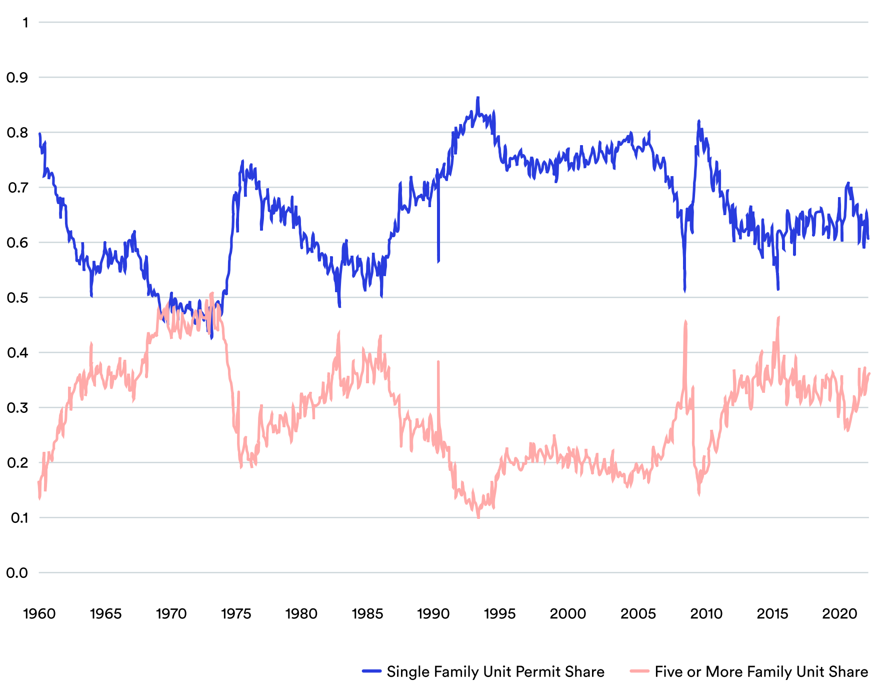
Data: Census Bureau, U.S. Department of Housing and Urban Development

However, this is merely the problem in aggregation. The issues are amplified at a more granular level. According to a publication by The White House[2], first-time homebuyers have severely limited options due to the sparse construction of homes smaller than 1,400 square feet; the rate is much smaller than before the GFC and down by more than 80% from the level seen in the 1970s. The lack of development in entry-level housing means many homeowners don't have a starting point, making the existing market more competitive. Housing scarcity can also be seen in the types of homes that are being approved.

Across the United States, but concentrated in many major cities, local zoning requirements make single-family homes the predominantly allowed building type. This means larger buildings or multi-family units don't comply with local zoning restrictions. As seen in the figure below, the share of single-family permits is smaller than pre-GFC, but the number is once again trending upward. Limiting the number of multi-family homes puts additional pressure on HPA. This is a political constraint, but there are real constraints in the housing market as well.

FIGURE 8

Unit Permit Share



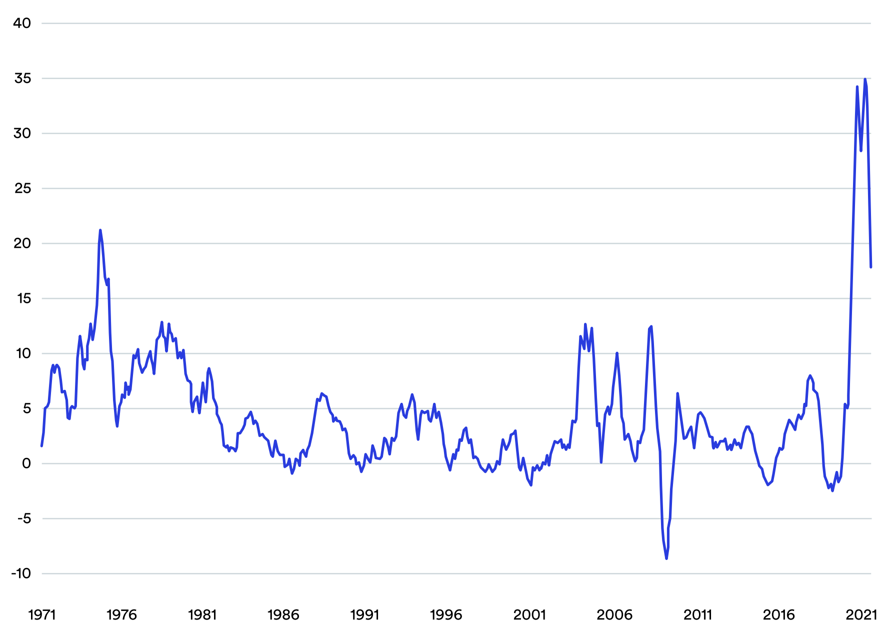
Data: Census Bureau and Department of Housing and Urban Development

[2] Bernstein, Jared, et al. "Alleviating Supply Constraints in the Housing Market." The White House, The United States Government, 30 Nov. 2021, https://www.whitehouse.gov/cea/written-materials/2021/09/01/alleviating-supply-constraints-in-the-housing-market/.

Most notably, those supply constraints include the lack of space to build housing in major cities in the U.S. and the increasing building costs. Many of the U.S.'s major cities are constrained by bodies of water, which could be compounded by climate change. Pre-existing structures or other restrictions limit the amount of buildable land. The rising inflation mentioned above has taken its toll on many of the input costs for producing homes. Construction costs like lumber or other building materials have been some of the most adversely affected during the pandemic. Construction materials costs as measured by the Producer Price Commodities Index spiked to a nearly 90% annual growth rate in January of 2022. This statistic excludes the premiums paid to construction wages and other labor-intensive jobs post-pandemic. The higher costs for producing a home in both wages and materials affect current home prices as well as make existing homes more desirable.

FIGURE 9

PPI Construction Materials FRED



Data: U.S. Bureau of Labor Statistics

Finally, while higher rental costs actually affect homeownership demand, they are subject to all of the same phenomena as home development. Many cities limit the number of new rental property development permits, similar to multi-family occupancy homes, with zoning restrictions. Costs for renting are at almost unprecedented levels, as close to half of the renters spend over a third of their income on rent and utilities. According to the same White House publication, vacancy rates are at 35-year lows between 2019 and 2021, so most all rental spaces are being occupied. Finally, rental prices had the largest annual increase at 8.8% in 2021 and topped the previous record set back in 2001, according to a report by RealPage[3]. Rental prices this high greatly increase the relative desire to occupy a home.

▲ 8.8%

Rent price spike drives HPA

[3] Willet, Greg. "U.S. Apartment Rent Growth and Occupancy Hit New Records in July." RP Analytics Blog, 4 Aug. 2021, https://www.realpage.com/analytics/u-s-apartment-rent-growth-occupancy-hit-new-records-july/.

The Demand Channel

The near-term future for housing demand is murkier; however, there remain reasons to be cautiously optimistic. While the Federal Reserve is tightening policy, factors such as survey data, mortgage applications, wages, household balance sheets, and rising natural interest rates are all leaning against the wind of the Fed tightening in lowering future HPA.

> **Inflation is decreasing the real cost of borrowing quite rapidly**

OOne of the best gauges of demand on its own is survey data, and one of the critical surveys around housing is the annual Survey of Consumer Expectations[4]. The survey takes place in April, after the Fed's initial rate hike and well after inflation has begun to take hold. Despite these factors, consumers were optimistic regarding the future of HPA. Consumers expect home prices to appreciate by 7.0% in their zip code in the next year, which is up from 5.7% in the previous year's survey. Over the five-year horizon, survey data remains unchanged with expectations averaging 2.2% annually.

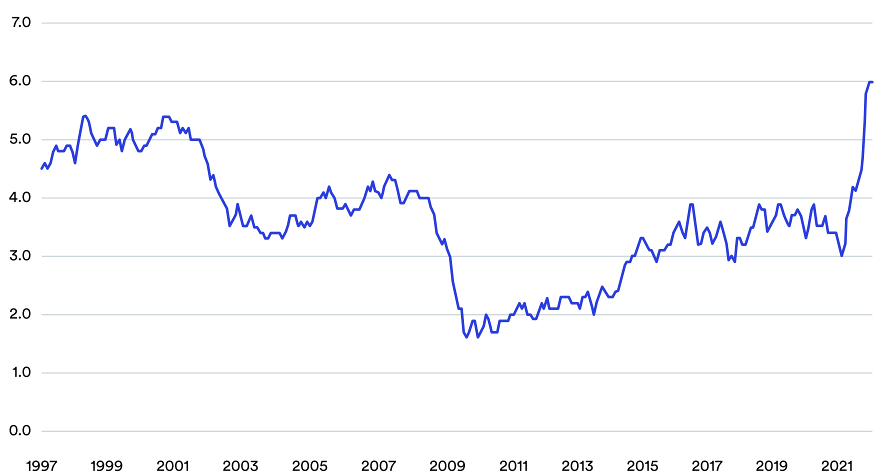
Both of these are strong indicators that consumers feel confident in the housing market in the short and medium run because expectations accelerated relative to baseline despite macroeconomic headwinds from policymakers. On a similar note, rent expectations have spiked dramatically. Last year's growth expectations were 6.6%. Over the next year, they skyrocketed to 11.5%. Once again, higher rents are more likely to drive housing demand as it's the relatively more affordable housing option.

[4] The Demand Institute. Survey of Consumer Expectations. New York. 2022

Mortgage applications also increased in the first week of May despite rising interest rates for home mortgages. While the increase wasn't dramatic, a 20 basis point rise in applications shows future homeowners are not deterred from rate increases. One possible explanation for this is that inflation is decreasing the real cost of borrowing quite rapidly so loans in real dollars are lower. Moreover, there has been significant wage growth throughout the pandemic. The figure below shows the Atlanta Fed wage tracker which has spiked dramatically to a record for the index. Higher wages are translating into a higher price for consumer goods, but it also gives potential buyers a better income stream to project for future homeownership.

FIGURE 10

Atlanta Wage Tracker

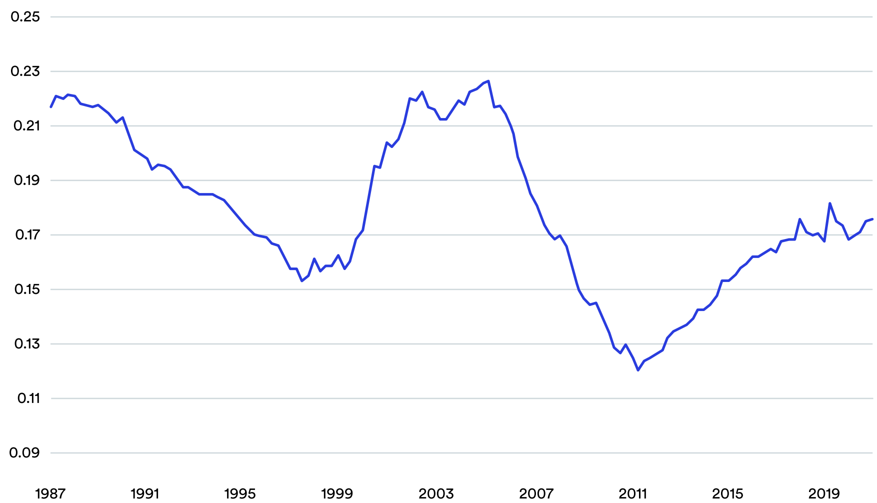


Data: Federal Reserve Bank of Atlanta

The household balance sheet is in a relatively good position historically, particularly when it comes to homeownership. Household net worth relative to disposable income gives a good measure of household leverage. While household leverage is historically elevated, the share invested in homeownership is well below its peaks in the 1990s and before the GFC. Previous house price depreciation, most notably in the 2008 financial crisis, was preceded by a large portion of household leverage dedicated to home equity.

FIGURE 11

Owner Equity Real Estate Relative to House Hold Net Worth

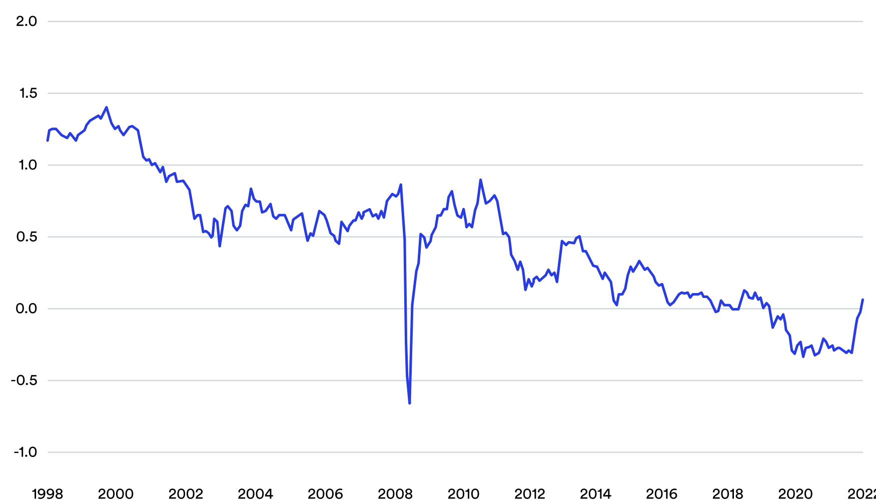


Data: Board of Governors of the Federal Reserve System (US)

Regarding monetary policies' role in the future of HPA, there is little doubt that rate increases in isolation will cause asset prices to fall as mentioned above, but the Fed is responding to tightness in the overall economy. A tight labor market, high wage growth, and higher inflation are factors the Fed and (potential) homeowners are responding to simultaneously. The FFR compared to a target of the natural rate of interest is a better gauge of the tautness of monetary policy. The natural rate of interest is a theoretical variable that economists construct to determine where the policy would be in an ideal world, or if the Fed were to perfectly meet its targets on unemployment and inflation. Most measures of the natural rate use macroeconomic data which lags the economy, so real-time updates are difficult. However, Christensen-Rudebusch 2019[5] uses financial market indicators to measure the natural rate. It was able to see real-time declines as the pandemic was setting in and monetary policy needed to be accommodative, and has seen increases as of late. These increases in the natural rate of interest suggest that even if the Fed is engaged in a tightening cycle, rate hikes alone aren't tightening policy.

FIGURE 12

Natural Rate of Interest



Data: Christensen-Rudebusch 2019 FRBSF

Moreover, in Pascal Paul's "Time-Varying Effect of Monetary Policy on Asset Prices,"[6] the research paper showed the effect of monetary policy shocks on various asset prices like HPA, bonds, and equities. By examining monetary policy changes in a 30-minute window around announcements they could see the changes in policy relative to market expectations based on options contracts before the announcement. They found that monetary policy's impact on home prices was most muted when home prices are higher. In our current environment, home prices are already high which could once again suggest rate hikes' impact be lessened on the future HPA.

[5] Christensen, Jens H. E., Glenn D. Rudebusch. 2019. "A New Normal for Interest Rates? Evidence from Inflation-Indexed Debt," Federal Reserve Bank of San Francisco Working Paper 2017-07. https://doi.org/10.24148/wp2017-07

[6] PPascal Paul; The Time-Varying Effect of Monetary Policy on Asset Prices. The Review of Economics and Statistics 2020; 102 (4): 690–704.

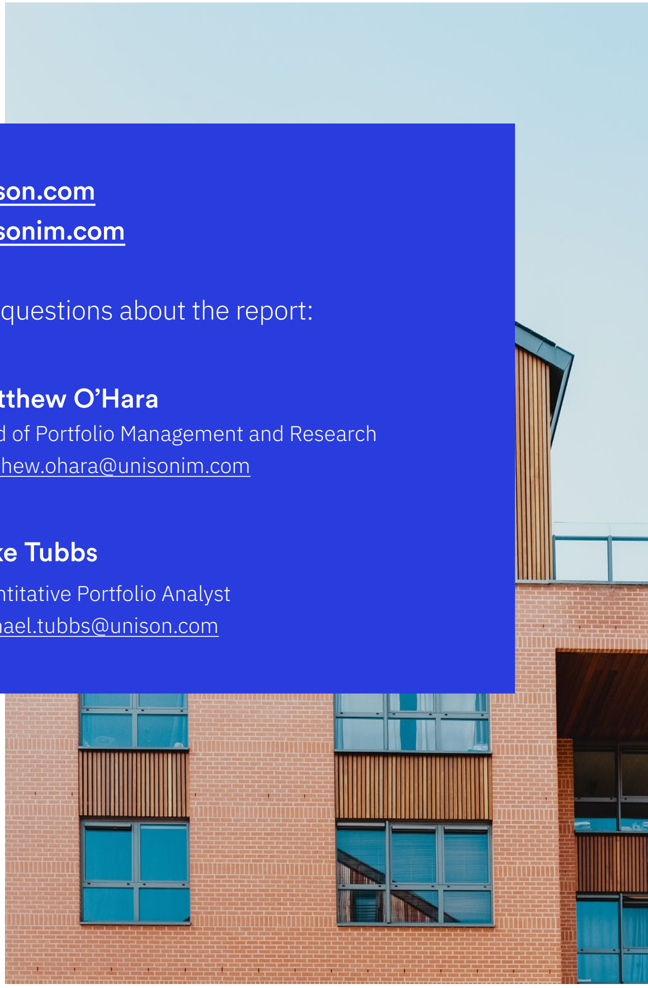
Conclusion

The historical relationship between HPA and inflation is strong, while the relationship between HPA and interest rates is mixed, but in conjunction with supply and demand, these macro factors will have a diminished effect on HPA. In the current environment, there are supply-side factors that will continue to constrain the market. While the future of demand is more uncertain, factors such as survey data, mortgage applications, and labor market conditions all bode well for housing demand.

As a result, Unison expects above-average growth in HPA in the medium term with a soft landing to the long-term average of HPA of around 4.5% per year.

About Unison

Unison is revolutionizing the home financing marketplace through long-term co-investment partnerships. The company works with select institutional investors to integrate homeownership investing into the U.S. home financing system through its HomeOwner programs. Unison HomeOwner provides existing homeowners with cash without the added debt or payments of a home equity line of credit (HELOC). The company's co-investment through this program is a true equity partnership, with no monthly payments, in which Unison shares in the increase or decrease in the future value of a home. Headquartered in San Francisco, Unison operates in 30 states plus Washington, D.C.



unison.com
unisonim.com

For questions about the report:

Matthew O'Hara
Head of Portfolio Management and Research
matthew.ohara@unisonim.com

Mike Tubbs
Quantitative Portfolio Analyst
michael.tubbs@unison.com

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