

Global macro matters

The foundations of housing

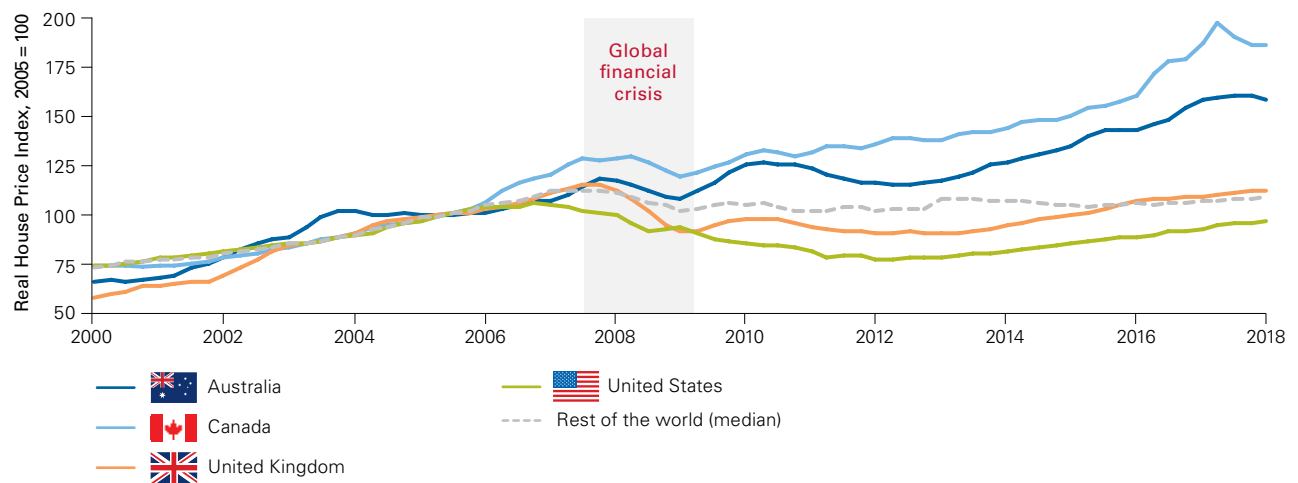
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Rapid appreciation in housing prices in much of the world has added to growing concern that major economies could soon experience a recession. House prices are at or above levels seen on the eve of the global financial crisis (Figure 1).¹ Our analysis, though, reveals that structural forces—supply, demographics, and interest rates—are responsible for much of this rally.

This paper focuses on four of the world's largest and most developed housing markets: Australia, Canada, the United Kingdom, and the United States.² We first assess current housing market valuations in a global context and discuss some of the reasons why prices are so elevated in each of these markets. We then discuss how housing interacts with the business cycle and the likelihood of a country falling into recession after a housing market crash.

Figure 1. Housing prices in Australia and Canada have rapidly appreciated



Note: Data cover the first quarter of 2000 through the first quarter of 2018.

Source: Federal Reserve Bank of Dallas International House Price Database.

¹ The role of the U.S. housing bubble in the global financial crisis was unique because of the use of securitized mortgages that served as collateral for bank lending across the world. As cross-border banking has contracted substantially in developed markets, even severe declines in house prices could not have the same global effect as the U.S. market did in the crisis.

² For an analysis of China's housing market, see Vanguard's Global Macro Matters paper *China's Key Risk: It's Housing, Not Stocks* (2015).









Valuation

The housing markets in Australia, Canada, the United Kingdom, and the United States all appear concerning when evaluated using common measures to gauge the health of the market and the consumer (**Figure 2**). Price-to-income and debt-service ratios are proxies for household purchasing power, while residential investment can give us an indication of housing supply.

Most markets seem highly valued relative to history. Australia and Canada stand out not only for their elevated valuations but also for the high debt burden households currently carry. Investors around the world are understandably concerned that housing-related stress may be on the horizon, given that the housing market played a starring role in the financial crisis.

This framework, while helpful, forms only part of a view on house prices, as many of the drivers in Figure 2 closely relate to the level of those prices. For example, low interest rates have helped support affordability both before and after the financial crisis. We supplement Figure 2 with a panel regression to ask: Since the trough in real housing prices (mid-2013 in our study), how much do structural factors explain the rally we have observed to date?³ Our analysis suggests that factors such as housing supply, low interest rates, and foreign investment explain a fair amount, though Australia and Canada may have overshot our educated guess at the level of real house prices given the factors in our model. By comparison, the United Kingdom and United States appear more balanced. **Figure 3** plots the answer to our question.

Figure 2: No single measure is a perfect gauge of valuation

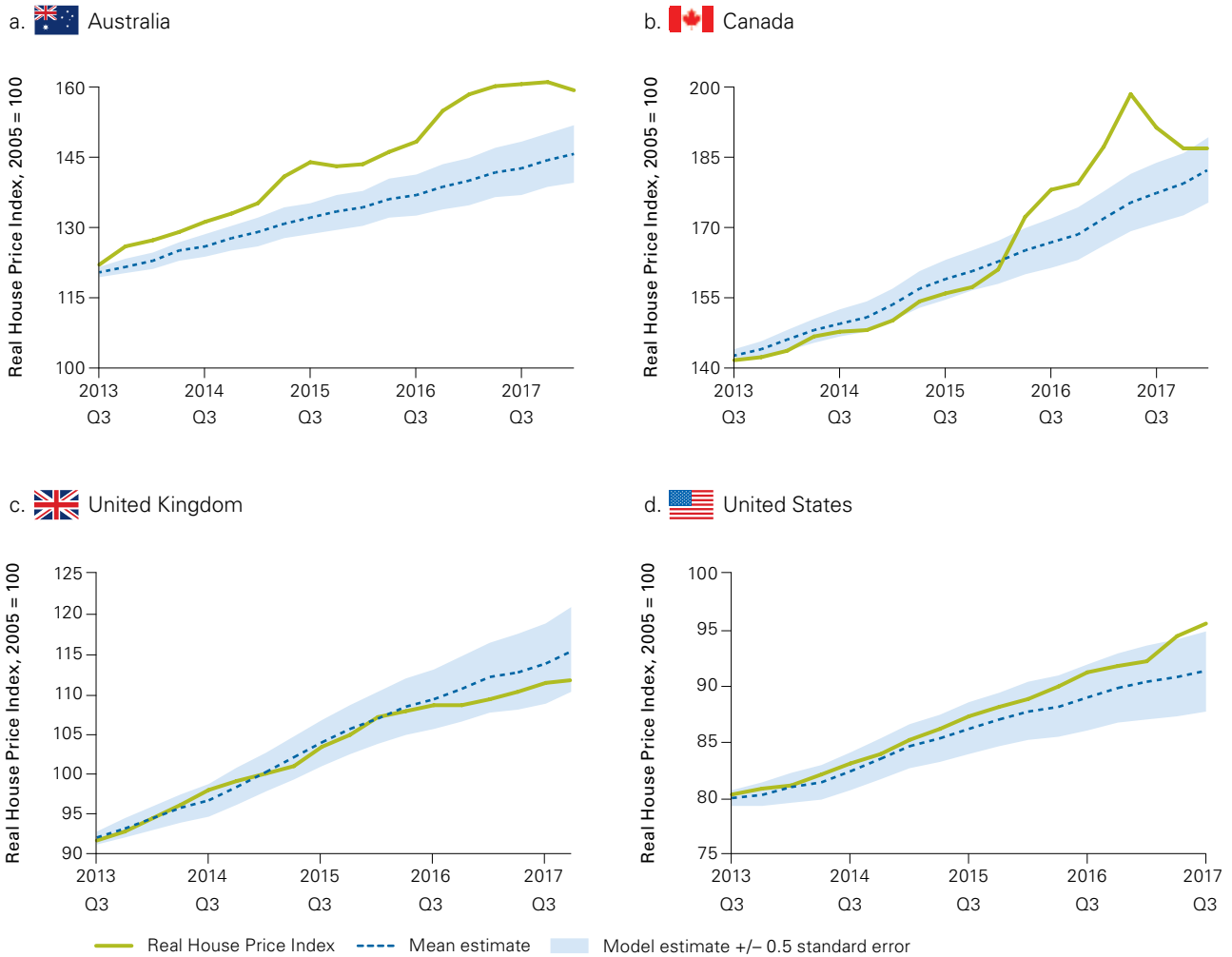
	 Australia	 Canada	 United Kingdom	 United States
House price growth	18%	24%	12%	13%
Demand drivers				
Income growth	-0.9%	6.4%	1.9%	2.3%
10-year government bond yield	2.6%	2.0%	1.2%	2.8%
Population growth	4.9%	3.3%	1.9%	2.8%
Valuation measures				
Price-to-income ratio	1.29	1.40	1.01	0.87
Price-to-rent ratio	1.19	1.47	1.13	1.09
Leverage and other measures				
Household debt to GDP	122%	100%	87%	79%
Debt-service ratio	15.5%	12.7%	9.7%	8.3%
Residential investment to GDP	5.7%	7.0%	4.1%	3.4%
 <25% percentile rank  50%–75% percentile rank  25%–49% percentile rank  >75% percentile rank				

Notes: Data cover the first quarter of 1999 through the first quarter of 2018 for house price growth, demand drivers, and valuation measures and through the fourth quarter of 2017 for leverage and other measures. Percentile ranks are calculated based on the data values for each country and each measure. Higher percentile ranks indicate more extreme values and are negatively correlated with housing prices.

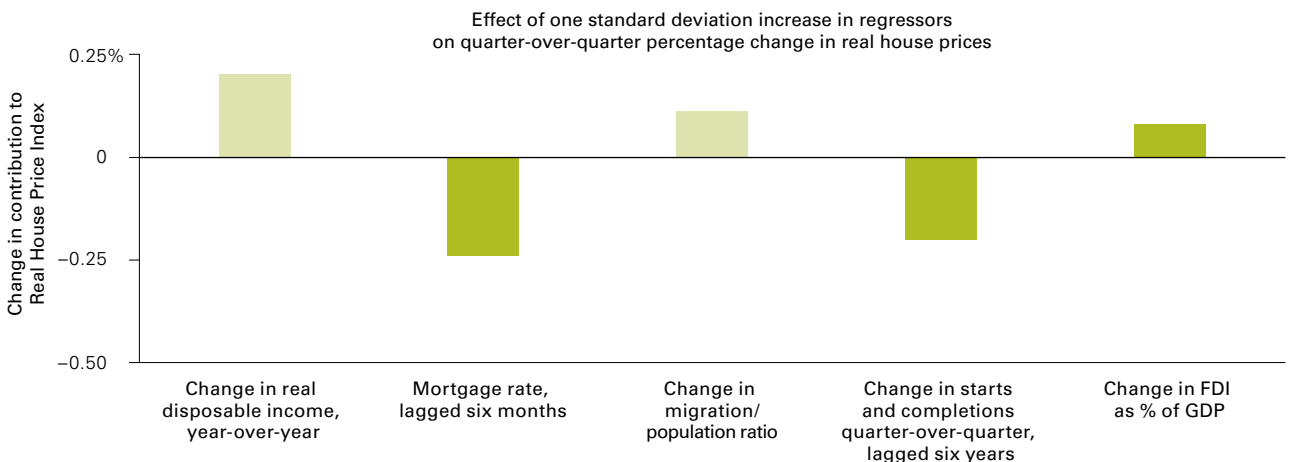
Sources: Federal Reserve Bank of Dallas International House Price Database, Bank for International Settlements, Organisation for Economic Co-operation and Development, Australian Bureau of Statistics, Reserve Bank of Australia, Statistics Canada, Bank of Canada, Bank of England, U.K. Office for National Statistics, U.S. Bureau of Economic Analysis, Board of Governors of the Federal Reserve System, and U.S. Census Bureau.

³ We include the following variables in our regression: real disposable income growth, mortgage interest rates lagged six months, the change in ratio of net migration (or immigration if net figures were not available) to total population, the log of housing starts plus completions lagged six years, and the change in the share of equity foreign direct investment as a percentage of gross domestic product (GDP). Figure 3 shows the results. We control for the unique characteristics of each market—everything from how investors behave to how mortgage rates are set—using country fixed effects. This model is not meant to forecast house prices or precisely identify what caused house prices to move; rather, it helps explain how we got here.

Figure 3. Structural forces explain much of the rally, but some markets may have gone too far



e. Interest rates, housing supply, and foreign buyers are significant drivers of real house prices



Notes: Panel regression uses country fixed effects and heteroskedasticity and autocorrelation robust standard errors, clustered by country. Estimation sample covers the third quarter of 1980 through the first quarter of 2018. Solid bars indicate the coefficient is significant at the 5% level.

Sources: Vanguard calculations, using data from CEIC, International Monetary Fund, World Bank, Federal Reserve Bank of Dallas International House Price Database, Australian Bureau of Statistics, Reserve Bank of Australia, Statistics Canada, Bank of Canada, Bank of England, U.K. Office for National Statistics, U.S. Bureau of Economic Analysis, U.S. Census Bureau, and Board of Governors of the Federal Reserve System.

Combining the results shown in Figures 2 and 3 gives us key insights about the likely path of real house prices for the four economies we follow. In Australia, Canada, and the U.S., many investors are concerned about high housing prices and declining affordability in large cities, especially Sydney, Melbourne, Toronto, Vancouver, New York, and San Francisco. It is tempting to look at Figures 2 and 3 and conclude that those three economies are sure to experience a correction. As with any other asset class, forecasting peaks—and troughs—is hard. (There are specific reasons, addressed briefly in the economic impact section on the facing page, why forecasting housing prices is as challenging as predicting recessions.) Investors and homeowners should prepare for several scenarios:

1. **House prices correct over one year:** Severe impact on the economy; recession likely. See the economic impact section for more information.
2. **House prices correct over three years:** Limited impact on the economy; slowdown or growth scare likely.
3. **House prices correct over five years:** Marginal impact, if any, on the economy.
4. **House prices continue to rise:** Positive impact on the economy; households benefit.

The global financial crisis primed people to equate “housing price decline” with the first scenario. In the economies we cover, the risk of that scenario unfolding, in our opinion, is low. Prices in Australia may moderate as a flowing pipeline of dwellings (mostly apartments) begins to reach the market. Normalizing interest rates could keep Canada’s house prices from appreciating further. In both markets, how households handle high debt burdens in an environment of slow income growth will offer strong clues about the scenario that could unfold. This is precisely why we included real disposable income growth in our regression.

U.S. house prices’ steady appreciation from sustainable supply-and-demand factors marks a divergence from the risky, speculative factors that fueled the 2000s bubble.

The supply constraint in single-family homes and population growth among 25- to 34-year-olds—a key first-time home-buying demographic—mute the downside risk from elevated prices, rising mortgage rates, and reduced homeownership tax benefits.

We are less concerned about overvaluation in the United Kingdom. We expect house price growth in the coming years to be subdued. The impact of recent macroprudential regulatory policies aimed at making buy-to-let investments less attractive are still feeding through the market.⁴ As Brexit negotiations continue, the health of the U.K. economy and the attractiveness of London property to foreign buyers remain highly uncertain. The Bank of England is also beginning to gradually raise interest rates as the labor market tightens, and this is expected to be a further drag on U.K. house prices.

Immigration and foreign investors are often cited as drivers of the run-up in house prices in these four economies, so we include proxies in our regression to test whether they add explanatory power. The coefficient on migration is positive but not significant. Given that demographic trends drive the economy over long horizons, our regression may be too short-term to capture decade-long effects.

Although much anecdotal evidence exists about foreign investors’ influence on property markets, finding reliable “hard data” to test this hypothesis is difficult. To serve as a proxy for foreign investors, we use equity foreign direct investment (FDI) as a percentage of GDP. This proxy is crude; equity FDI also includes direct equity holdings of private firms, factories, and other capital goods, so we treat the coefficient as an upper bound on the effect of foreign property investors.

Our regression suggests that foreign investment is positively correlated with real house price growth, all else being equal, so foreign real estate investors could effectively lift prices.

⁴ These include the April 2016 increase in stamp duty land tax on second (or additional) home purchases, the January–September 2017 tightening of buy-to-let underwriting standards, and the reduction in buy-to-let tax relief being phased in from 2017 to 2020.

Economic impact

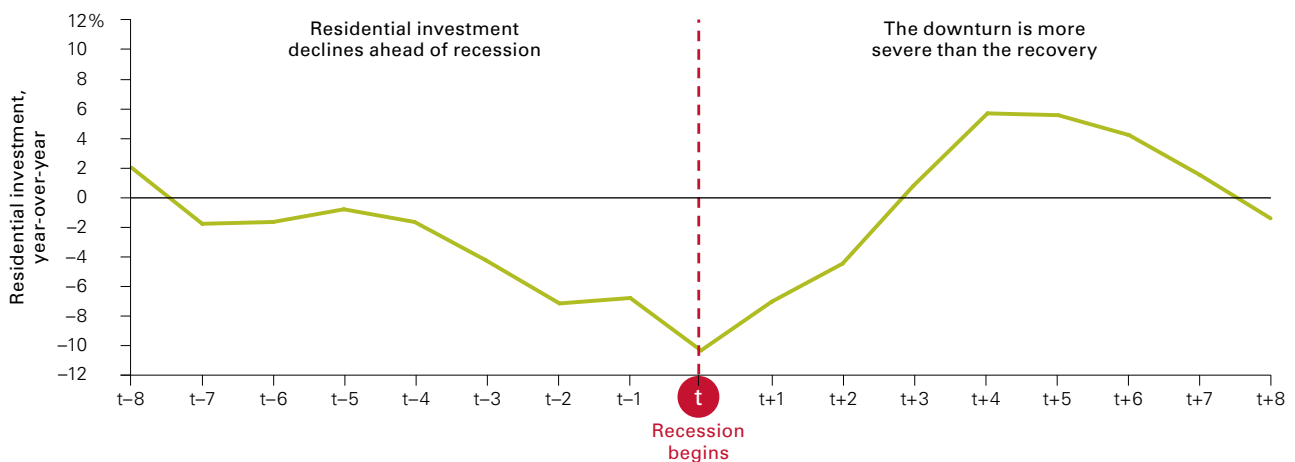
As we outlined earlier, sharp changes in house prices or high valuations naturally make investors uneasy about the near-term economic outlook. The housing market and the business cycle are intrinsically linked, as the housing sector's size means that changes in it reflect conditions in the broader economy.^{5,6} It is difficult to say that one *causes* the other, but we do know they are highly *correlated*; our analysis focuses on patterns likely to appear when either cycle is turning.⁷ Housing influences the economy through two main factors: consumption and investment.

First, rising prices promote consumption. Economists often call this the "wealth effect"; higher house prices create more home equity for households to borrow against, boosting those households' confidence that their finances are healthy. This channel works in reverse, however, when house prices decline. Excessive leverage, consequently, is often present when housing is the catalyst of an economic downturn.⁸

Second, rising house prices encourage construction, supporting residential investment and the construction sector. Builders, sellers, and buyers must make decisions with multiyear expectations, so a change in housing activity (such as number of building permits) typically indicates a broader shift in economic conditions. For these reasons, housing investment is often a useful leading economic indicator.⁹

Figure 4 shows the median growth in residential investment during 14 recession events across the U.S., the United Kingdom, Canada, and Australia from 1970 to 2018. Time "t" is when the recession began. Although not causal, it is striking how residential investment tends to significantly decline ahead of recessions. Note also that the downturn is more severe than the recovery. This shape could reflect the drop-off in residential investment through downturns, which leads to less supply and higher prices once the economy emerges from recession.

Figure 4. Residential investment is a leading indicator and highly cyclical



Note: Figure shows year-over-year median residential investment growth during 14 recession events starting at time "t" across the United States, the United Kingdom, Canada, and Australia, 1970–2018.

Sources: Australian Bureau of Statistics, Statistics Canada, U.K. Office for National Statistics, and U.S. Bureau of Economic Analysis.

5 Kohlscheen, Mehrotra, and Mihaljek (2018).

6 The global housing market's value is estimated at more than \$160 trillion, and housing is often the largest component of total household wealth. See Barnes and Tostevin (2016).

7 This phenomenon is known as reverse causality: X causes Y, but Y also causes X. See Muellbauer (2012) for examples of how economists address this issue when modeling housing.

8 Being "underwater"—having negative equity—can make default relatively attractive under extreme financial stress. See Muellbauer (2012) for a discussion on excess leverage.

9 See Leamer (2007).

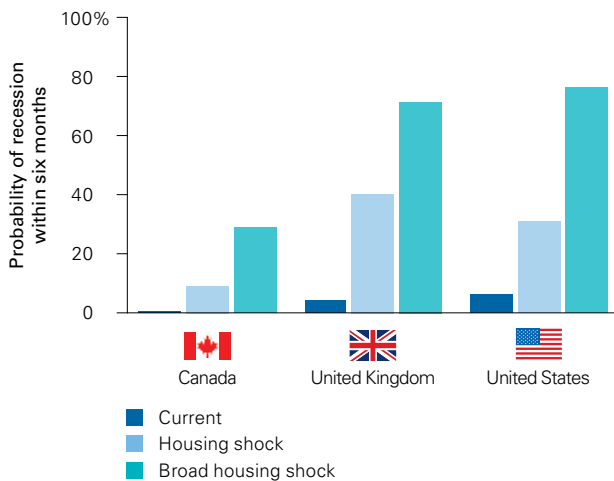
What if house prices crashed?

The pattern reflected in Figure 4 naturally puts recession top of mind whenever house prices fade. **Figure 5** estimates how the probability of a recession would change if nominal house prices fell by 20% for Canada, the United Kingdom, and the U.S.^{10,11} This analysis essentially sizes up the impact of a scenario in which house prices correct within one year using our panel regression.

The model includes a selection of variables that we believe informatively signal the probability of a future recession. These include (1) Vanguard’s Leading Economic Indicators, (2) the term spread, (3) a proxy for credit spreads, (4) equity market returns, and (5) house prices.

The first set of estimates shows current probabilities, and the second set assumes only that house prices drop by 20%, with all other variables remaining constant. In reality, house prices and the other factors in the model are likely to be highly correlated. So we include a third set of results in which the housing price decline spills over into other variables, based on their historical correlation to housing prices during downturns.¹² Not surprisingly, weakness in house prices significantly raises the chances of a recession.¹³

Figure 5. A steep decline in house prices would increase the likelihood of recession



Sources: Vanguard calculations, using data from the Bank for International Settlements.

Conclusion

Housing is a complex asset with many linkages to the economy, from construction to how households decide to save and spend. Given the strong performance of housing markets and declining affordability in four major economies, many investors are naturally concerned that housing may soon peak.

Common factors, namely low interest rates and healthy population growth, are responsible for what we see in Australia, Canada, the United Kingdom, the United States, and other developed economies. Grasping the full picture, though, requires a deeper look into each economy. These country-specific factors are why Canada and Australia appear lofty relative to the United States.

Most investors accept that “housing is the business cycle.” Although investors in the countries we cover have different views on what drives housing markets, most agree that real estate activity is a steadfast indicator of broader economic conditions. Housing market activity typically falls before the onset of a recession, and a significant decline in house prices increases the odds of a recession, justifying the attention the market receives.

Although house prices may soften slightly in several countries, this result would not compromise our economic outlook for Australia, Canada, the United Kingdom, and the United States. Structural forces unique to each of the markets will drive them. Households should anticipate that real estate—like other assets—will move higher and lower over time, underscoring the importance of patience and discipline.

¹⁰ This is a relatively large shock. During the 2007–2009 financial crisis, U.S. and U.K. house prices fell 15%–20%; prices in Australia and Canada were less affected, falling about 5%.

¹¹ Australia was excluded from the analysis; we could not compute an estimate because Australia has not experienced a recession in recent decades.

¹² In addition to a 20% decline in nominal house prices, this specification features a 5% drop in the stock market, a 0.4-unit decline in Vanguard’s Leading Economic Indicators, and a 25% widening in credit spreads.

¹³ Canada’s relatively low response to a decline in housing is most likely because its business cycle is more related to the broader commodity cycle than than is the case with most developed nations.

References

Barnes, Yolande, and Paul Tostevin, 2016. *Around the World in Dollars and Cents—2016*. London, U.K.: Savills.

Kohlscheen, Emanuel, Aaron Mehrotra, and Dubravko Mihaljek, 2018. *Residential Investment and Economic Activity: Evidence From the Past Five Decades*. BIS Working Paper No. 726. Basel, Switzerland: Bank for International Settlements.

Leamer, Edward E., 2007. *Housing Is the Business Cycle*. Jackson Hole, Wyo.: Federal Reserve Bank of Kansas City Economic Policy Symposium Proceedings, pages 149–233.

Mack, Adrienne, and Enrique Martínez-García, with Valerie Grossman, 2018. *A Cross-Country Quarterly Database of Real House Prices: A Methodological Note*. Federal Reserve Bank of Dallas, Globalization and Monetary Policy Institute, Working Paper No. 99.

Muellbauer, John, 2012. When Is a Housing Market Overheated Enough to Threaten Stability? *Property Markets and Financial Stability*, Conference Volume 2012, pages 73–105. Sydney, Australia: Reserve Bank of Australia.

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