

Housing and Mortgage Market Review

HaMMR – Summer 2020

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Housing Sector Is Brighter Than the Overall Economy *By Ralph DeFranco*

There is growing evidence of a V-shaped recovery in U.S. housing demand, even as the economic outlook has darkened and the path to a full recovery in employment is looking longer and bumpier than some forecasters were predicting just months ago.

While the overall housing market is being buffeted by both strong positive and negative forces, on balance we believe the positives are strong enough to prevent material home price declines and have the potential to keep home price growth positive for the year. Strong housing demand is being driven by four key factors:

1. Record low mortgage rates.
2. A need for more living space.
3. A bump-up in savings (the ratio of personal savings to disposable personal income in May was 23% vs. 8% a year earlier).

4. Supportive demographic trends (the Millennial cohort is large and entering the prime age for homeownership).

The supply situation is also favorable for home prices due to a near-record low number of homes listed for sale and a slowdown in new construction due to the pandemic. Elaborating on our thinking, we first acknowledge that the COVID-19 pandemic is creating clear downside risks, including an extended period of high unemployment and, perhaps, profound and lasting changes in how we work and spend.

Housing Sector Is Brighter Than the Overall Economy *(continued from page 1)*

The Relative Value of Housing Just Went Up

Interestingly, the pandemic actually increases the demand for housing among those who can afford it. Why is that? Because economics is all about trade-offs. And the relative value between housing vs. other uses of money — such as international travel, live events, etc. — has clearly become more favorable to housing. Specifically, many households now have an increased need for indoor and outdoor space for home offices, workout equipment and rooms for young adult or college-age children. It is a super-sized version of what happened after 9/11 when an increase in the desire to “nest” pushed up home prices even during the 2000 recession.

In addition to the desire of many families for a more spacious primary residence, there is also elevated interest in purchasing second homes, both out of concern about future lockdowns and as an alternative to vacationing in shared spaces, such as hotels. Demand for homes (both for second homes and for relocating) appears to be strongest within reasonable driving distances of dense urban areas such as New York and San Francisco, according to Realtor® websites. In addition to a higher relative value of more spacious homes, the value of housing is also shifting by region because of the trend toward more remote workers. Changes caused by the pandemic are a negative for dense, expensive and high-tax areas and good news for everywhere else. More options to work remotely will accelerate the trend of people moving out of high-tax states, such as people moving from New York to Tennessee or from California to Arizona. Within states, the movement will be toward areas with attractive natural amenities.

More remote work also suggests that homeownership could increase. After all, affordability is far better outside of the mega-cities that have had far stronger job growth than single-family construction over the past decade, and those more urban areas have seen excessive home price growth compared to income growth. That said, we don’t expect dense rental markets, such as New York City, Boston or San Francisco to empty out so much as to slow since there is still a powerful economic magic in collaborating in the same space and near related firms (known as agglomeration effects) and because working remotely will remain somewhat riskier for your career. Bottom line: The suburbs, exurbs and small towns are suddenly hip.

Government Actions Help Support Housing

There have been massive, all-in monetary and fiscal policies to mitigate the pandemic’s impact:

- A \$2.2 trillion CARES Act Package and a supplemental \$484 billion fund were created to assist furloughed or laid-off workers through the Pandemic Unemployment Assistance program. Congress also provided forgivable loans under the Payment Protection Plan to small businesses on the condition they retain employees. Lawmakers also provided financial assistance through the Economic Injury Disaster Loan program.
- Mortgage forbearance is available on federally backed loans (which account for 67% of residential mortgages and 47% of multi-family mortgages).
- The Federal Reserve reduced the rate it charges banks by 150 basis points to 0.25% and has increased the money supply (M2) by nearly 20%, double the increase during the last recession.
- Even the high unemployment rate is not as damaging for housing demand and supply as it first appears since homeowners have a lower unemployment rate than the overall population. Another help to housing is that there was a large expansion in eligibility for unemployment benefits and a significant increase in the size of unemployment insurance payments through the end of July.

Summary of Housing Indicators



We turn now from the higher relative value of housing and extraordinary government support to looking at the surprising strength of recent indicators of home sales and prices. We also offer some thoughts on implications. Certainly some caution is needed in interpreting current economic data because of temporary factors such as lockdowns and changes in policies. Thus, judging the totality of the data is more relevant than any single data point.

Home Sales

Key recent indicators include the following:

- The pending **existing home sales index** from The National Association of Realtors (NAR) surged dramatically in May, up 44% from the prior month. Contract signings are only down 5% year-over-year due to a 33% drop in the Northeast as lockdown measures were in full force. Since pending home sales led reported home sales by one to two months, May’s disappointing existing home sales may well have been the bottom for this cycle.
- **New single-family home sales increased 14% in June** (after rebounding by 17% in May) to a seasonally adjusted annualized rate of 776,000 units after sharp declines in the prior three months. Compared to a year ago, new home sales were up 7%. That resulted in the inventory of new homes for sale dropping to a low 4.7 months’ supply at the current rate of sales.
 - With limited prospects for a rise in existing home inventory, new home sales will likely see further gains. Since builders are constrained by many factors — such as tight bank lending, staffing constraints and delays in materials — they are likely to respond to increased demand by increasing prices faster than increasing production.
 - Given all this, it is not surprising that **builders’ confidence is up**. The National Association of Home Builders’ housing market index was 58 in June, where a reading above 50 indicates a favorable outlook. That was 21 points higher than the previous month and the improvement was in all regions.
- **Mortgage purchase applications** have staged a remarkable recovery and are now at 10-year highs. After an initial drop of 42% from their high in January, applications surged 62%. Partially offsetting higher purchase apps are tighter credit conditions, which means an increasing share of mortgage applications will be denied. Still, with inventory at record lows, bargain hunters are likely to be disappointed.
- Additional evidence of heightened interest in housing is that while consumer spending and business investment fell 8% to 9% in Q1, **residential investment** (home building, home sales, remodeling) was up a whopping 21%.
- Consumer views on housing have been improving since bottoming out in April. For example, the Fannie Mae Home Purchase Sentiment Index® increased nine points in June to 77. Consumers reported a significantly more positive view of homebuying and home-selling conditions, as well as greater optimism regarding home price appreciation. While this index is still down 15 points year-over-year, the share of renters who say it’s a good time to buy a home is now at its highest level in five years.

Home Prices

Home prices are harder to get a read on since home price data is released with a lag of several months. Nevertheless, we do know:

- The Federal Housing Finance Agency (FHFA) purchase-only index fell slightly in the month of May, reflecting the high uncertainty when sales contracts were being negotiated at the start of the lockdowns in March and April. The year-over-year growth was still a strong 4.9%.
- The S&P Case-Shiller National Home Price Index increased 0.5% in April, down only slightly from March’s month-over-month gain and up 5.7% year-over-year.
- The more volatile median existing home price was up 3.5% year-over-year in June, marking 100 straight months of year-over-year gains.
- Asking prices on new listings have been increasing in recent weeks, according to Realtor.com.¹

¹ "Housing Market Recovery Index Highlights" Realtor.com: June 25, 2020.

Conclusion

Even as COVID-19 caused major hits to employment and the U.S. economy overall, housing has remained remarkably strong. The most obvious driver of demand is the decline in mortgage rates. Also supporting housing is strong federal government backing and the relatively greater importance of having a home with sufficient space to be comfortable. While the increased need for a home office, space for the family and/or exercise equipment could put an end to the micro-housing trend, it does support housing demand overall. This is particularly true in less dense areas that had been laggards in terms of home price growth over the past decade. All of this is driving a pickup in home sales, sentiment and purchase applications, suggesting continued strength in the near term is likely.

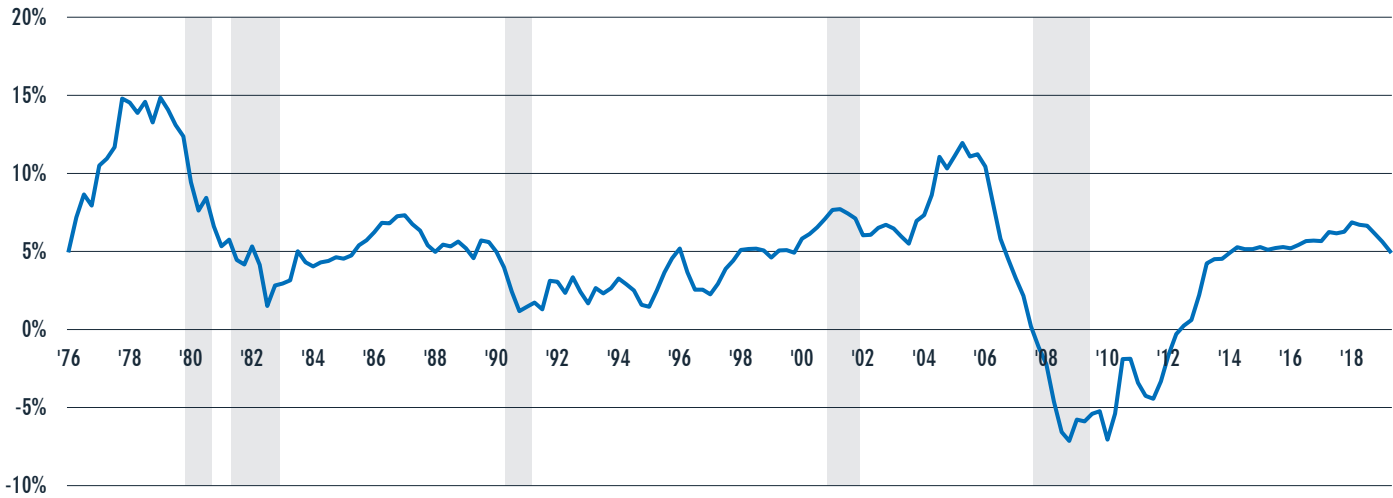


Why This Time Is (Very) Different Than Last Time

While mortgage originations are expected to be roughly flat this year due to a limited supply, home prices nationally are likely to be higher by year end. To explain why we think this, we start by examining how home prices fared in past recessions and then turn to comparing today’s housing fundamentals to those at the start of the last recession.

Of the five U.S. recessions between 1980 and 2019, it was only during the housing-led recession of 2007–2009 that the U.S. overall had negative annual home price growth. As you can see in the following chart, the typical pattern of national home prices is that price growth slows during recessions but doesn’t turn negative. That was true during four of the five recessions in prior decades and is the most likely pattern we will see in this recession.

U.S. Annual Home Price Growth (gray bars indicate recessions)



Why was the last recession so different from historic norms, and what does that imply about the risks to home prices today? The following table highlights how differently we see the housing market in 2020. The five factors we think are the most important are: supply, demand, underwriting, affordability and the regulatory environment.

	HOUSING MARKET 2007	HOUSING MARKET 2020
SUPPLY	Overbuilt.	Underbuilt by several million units.
DEMAND	Buyer irrational exuberance.	Cautious buyers.
UNDERWRITING	Poor loan quality.	High loan quality.
AFFORDABILITY	Poor affordability, on average.	Reasonable affordability, on average.
REGULATIONS	Loosely regulated.	Tightly regulated.

To elaborate on why the situation today is very different than it was in 2007:

- **Housing is in short supply** now from coast-to-coast due to historically low levels of construction over the past decade. The Arch MI economics team estimates the housing shortage to be between 1 million and 2 million units compared to being overbuilt by more than 1 million units in 2007.¹ The notion of a broad and persistent housing shortage is consistent with results from a Freddie Mac research paper that recently estimated the total U.S. housing shortage to be around

3.3 million units.² And the situation has been getting worse over time: Freddie Mac, Moody’s Analytics and the Urban Institute all estimate the shortfall has been growing by by 300,000 to 350,000 units a year on top of the shortfall from prior years.³

- In terms of demand, one way to judge whether **buyers are cautious** is a Gallup survey that asks if this is a good time to buy a home. The highest favorable response they ever got was in 2003, when 81% thought it was a good time to buy a house, compared to 61% in 2019. Another way to look at sentiment is that the homeownership rate is much closer to its long-term average today compared to an all-time high in 2006. Lastly, recall that house flipping was widely celebrated in the press back in 2004–2007, while this cycle’s homebuyers are much more aware of the downside risks.
- **Mortgage loan quality** has been exceptionally high over the past 10 years, according the Urban Institute’s Housing Credit Availability Index. The Urban Institute also quantified what most of us in the industry know, which is that mortgage credit was unusually loose in the early 2000s. We estimate that somewhere between 50% and 70% of loans from 2007 with down payments of less than 20% down could not be approved under recent guidelines.
- Nationally, **affordability** remains better than historic norms thanks to record low interest rates. The percentage of median income needed for monthly payments on a median-priced home is only 30% at the end of Q1 vs. 41% in 2006 (back when mortgage rates were around 6%).⁴
- The **Dodd-Frank** act of 2010 fundamentally tightened both banking regulation and the mortgage underwriting process. For private-label securities, changes in both the law and in demand have altered the once prevalent strong demand for lower-quality loans.

For all of these reasons, we believe home prices are supported by a solid foundation and since homeowner equity, or the absence thereof, is the predominant driver of default, this bodes well for mortgage default performance. Today’s strong fundamentals act as a giant shock absorber against any downside movements in price due to the current economic shock. This is not to say that home prices can’t sag in some areas or that the economic situation could not materially worsen.

Location also matters, with denser and more expensive areas in the Northeast and along the Pacific Coast clearly at higher risk. That is because these areas have already been losing people to out-migration south and to the Mountain West for many years and have only avoided falling populations because of an inflow of international immigration, which will be nearly non-existent this year.

While it is impossible to know with certainty, we believe home prices nationally will hold up well over the near term. Housing demand and construction have remained relatively strong given the situation and are likely to continue to remain healthier than the overall economy. What happens after this year depends on many unknowns. While darker scenarios are always easy to imagine, current conditions suggest flat to positive home price growth due to strong fundamentals, as well as large government stimulus measures. The next few years are highly uncertain, but what is very clear is that we entered 2020 with a far stronger housing market than we did in 2007. Given how different housing market conditions are now compared to the last recession across multiple dimensions (supply, demand, underwriting quality, affordability and the regulatory environment), there is no reason to believe we will see a repeat of the house-price drops seen in the last recession. Last time, there were fundamental housing and financial market imbalances that had to be worked off.

¹ This is based on comparing net new supply to demand over many years. This is consistent with an estimate that the excess supply was between 1.2 million and 1.7 million units in 2009 by James E. McNulty, Business Economics, October 2009.

² Freddie Mac, “The Housing Supply Shortage: State of the States,” Feb. 27, 2020. They estimate a shortfall of 3.3 million units but it varies between 0.9 million and 4.0 million units depending on assumptions.

³ “Freddie Mac Insight Examines the Housing Supply Shortage by State” press release. Moody’s Analytics: “2020 U.S. Economic Outlook: Two-Handed Economist.” Urban Institute: “January 2020 Housing Chartbook.”

⁴ Please see page 11 for details on our assumptions (such as 10% down) and for state-level values.

Partner with Arch Credit Risk Services

Arch Credit Risk Services provides clients the benefit of the full mortgage underwriting and analytical expertise of Arch Capital Group's Global Mortgage Group, which includes Arch Mortgage Insurance Company (Arch MI), the largest provider of mortgage insurance in the U.S.

At Arch, our focus is on providing risk management, risk financing and capital optimizing products to the housing sector worldwide. Arch MI, and the MI companies we have acquired, represent more than 50 years of MI industry participation.

Our dedicated team of credit risk modelers, data scientists and actuaries provides clients with the full suite of analytical services required to underwrite Fannie Mae and Freddie Mac Credit Risk Transfer (CRT) transactions.



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Market leading U.S. Mortgage Insurer and participant in CRT programs.



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Modeling Mortgage Risk in the Age of COVID-19

By Rob Hardie, SVP, Head of Data Analytics, Mortgage Group



The breathtakingly rapid change in economic conditions as a result of the COVID-19 pandemic is unprecedented. For example, the national unemployment rate of 3.5% in February of this year jumped to 14.7% in April. By way of comparison, in the Great Recession it took more than two years for the unemployment rate to rise from 4.4% in May 2007 to a peak level of 10% in October 2009. A massive response to COVID-19 has ameliorated propensities for mortgages to default through the government providing stimulus packages, the Federal Reserve easing monetary conditions and the mortgage industry supporting forbearance programs for borrowers.

According to the MBA Weekly Survey, the proportion of GSE mortgages in forbearance peaked at 6.4% as of May 31 and declined marginally in the following weeks. As described in the "Housing Sector Is Brighter Than the Overall Economy" article on page 1, we expect single-family housing to be a bright spot in the economy. However, there will still be an impact on mortgage risk and a need for the industry to understand how forbearance programs may impact the performance of mortgage portfolios. Many parts of the mortgage industry are wrestling with this question and we want to share some thoughts on a possible modeling approach to take.

As with many players in the mortgage industry, Arch MI uses a state transition model to predict expected loan performance and carry out stress testing of our portfolio. This model predicts the likelihood of loans moving between various delinquency states each month based on borrower characteristics, loan characteristics and expected economic paths. For example, will a loan that is current on payments this month go delinquent, prepay or stay current next month? With a significant number of loans in forbearance, or expected to take up forbearance, the key question we faced was how to classify the loans in forbearance in our model. Should we treat forbearances as delinquent as reported by servicers or should we treat forbearances as current as the credit bureaus have been directed to do by the GSEs? Many industry models are approaching the problem using one of the two following methods, with management teams left to adjust for the respective inadequacies of each method.

Option 1: Treat forbearances as delinquent.

Our concern with this approach is that the model will predict the roll rate to foreclosure in the same way as any standard delinquency. We believe this approach would be too punitive because we expect a large portion of borrowers exiting forbearance to take advantage of modification programs or payment deferral plans to become current again as the economy reopens and borrowers return to work — similar to how borrowers performed after recent natural disasters.

Option 2: Treat forbearances as current.

Our concern with this option is that some borrowers will still be unemployed at the end of their forbearance period and unable to return to current status by taking advantage of modification programs or payment deferral plans. This approach would be too optimistic and under-predict the number of loans that will still be delinquent as forbearances end.

A Third Option

We felt that neither of these approaches would properly capture the expected behaviors or be flexible enough to allow us to understand sensitivity to changing assumptions as we receive updated forbearance performance data over the rest of the year and into 2021. Since our traditional modeling approach would not work, we decided that this unique situation requires a unique solution. We devised a third modeling option: the creation of a new forbearance state in our state transition model.

We faced two challenges, including a lack of a historical data set to predict which loans impacted by COVID-19 would be expected to take up forbearance vs. returning to current. Second, we needed a solution in weeks, not the months it typically takes to build a traditional model. As a result, we created a simple set of business rules and assumptions that we could implement rapidly and update as new performance information becomes available. We adjusted our credit model to move a portion of our portfolio from the current state to forbearance state in a way that can be quickly updated as we continue to receive data from our servicers. We also applied logic reflecting the percentage of loans we expect to return to current at the end of forbearance and the timing of cures based on the length

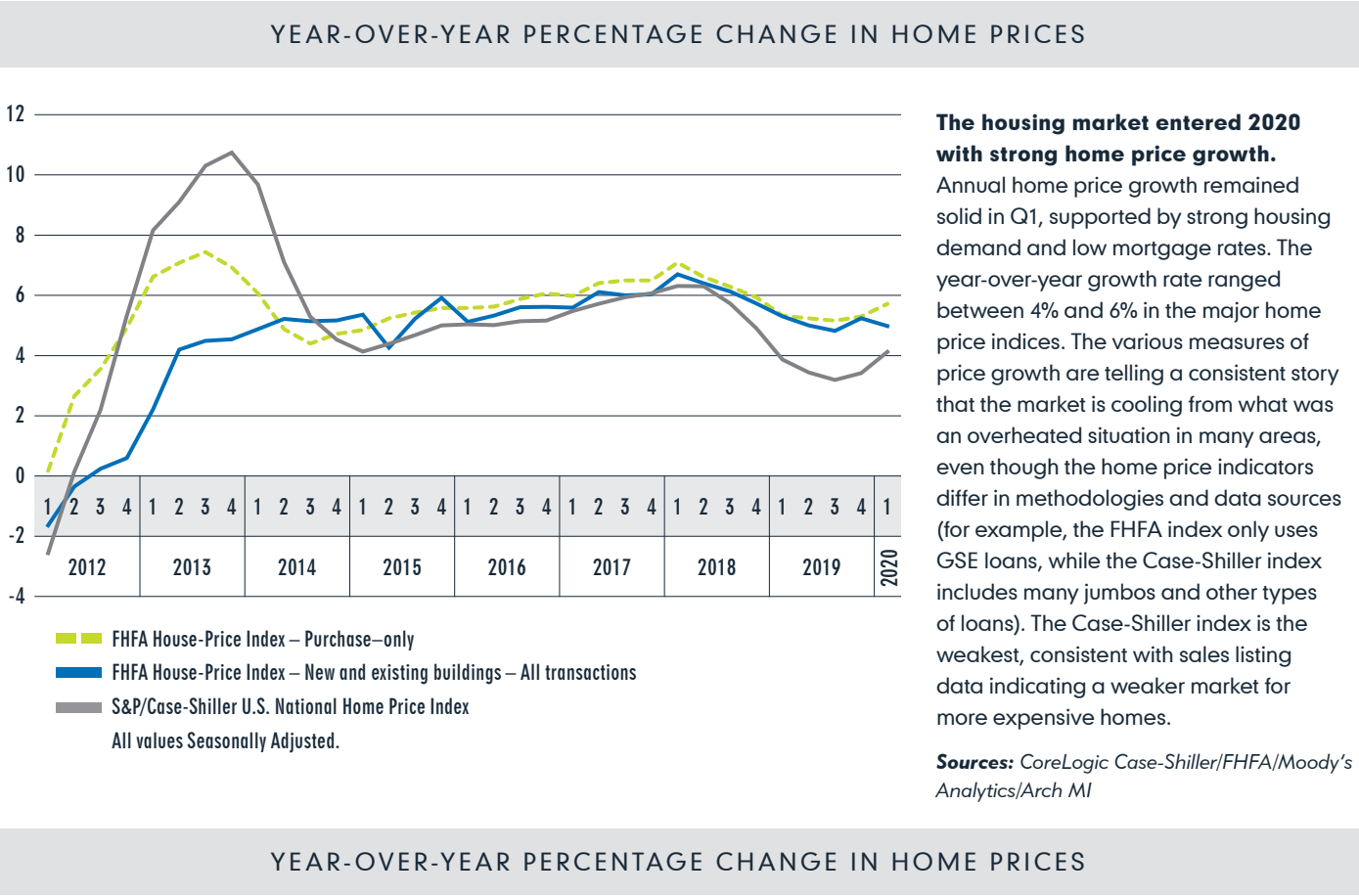
of each forbearance plan. We used prior GSE forbearance experience and judgement to inform the assumptions to reflect the macroeconomic environment.

The creation of this new forbearance state has effectively given us an opportunity to “park” forbearances outside of the normal delinquency parameters of our model until we expect them to return to either a true current or true delinquent state. This approach offers a number of advantages as we model expected performance of these loans:

- In contrast to a third-party black box model, our simple and transparent modeling approach allows users to understand and interpret the model outputs.
- The assumptions are very easily updated to give us the ability to quickly update and rerun our model so that we can understand the impact of new information that comes out and perform sensitivity testing as the COVID-19 situation unfolds. Keeping forbearances in their own state makes it very easy to track expected forbearance volumes through time vs. mixing them with other delinquencies.
- By placing forbearances in the new forbearance state, we only apply our economic forecasts when forbearances return to a standard current or delinquent state to drive predictions of future performance, home prices and unemployment rates later this year and into 2021. This would have more relevance as to whether forbearances eventually go to default than today’s home prices and unemployment rates.
- This approach will be valuable for any future forbearance loans coming from natural disasters or pandemics.

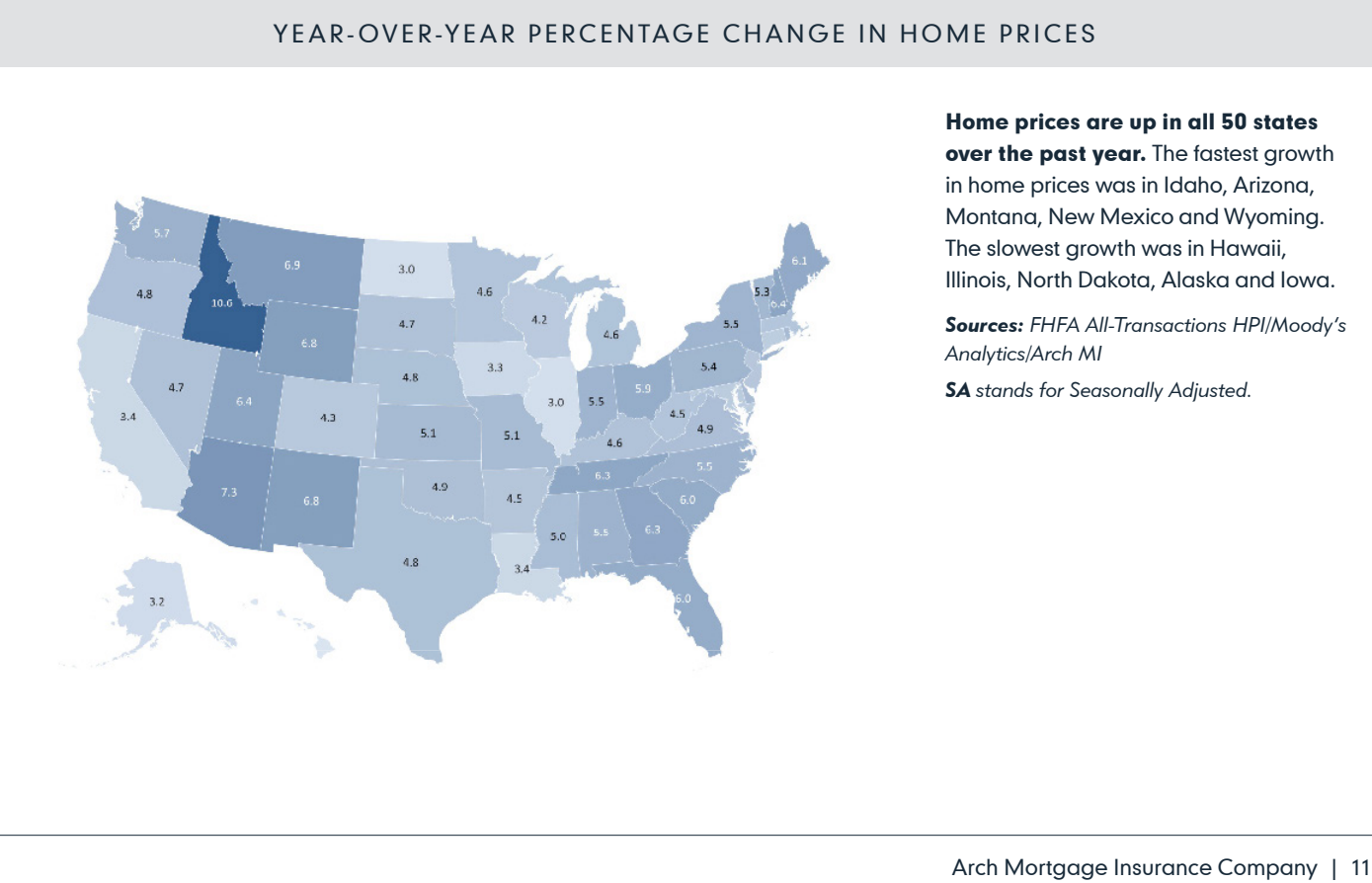
Our approach to modeling the impact of COVID-19 will continue to evolve over time, but our decision to implement a fast, simple and transparent modeling approach has given Arch MI and our advisory clients unique and valuable insights into the COVID-19 risk in our mortgage portfolio.

Housing and Mortgage Market Indicators



The housing market entered 2020 with strong home price growth. Annual home price growth remained solid in Q1, supported by strong housing demand and low mortgage rates. The year-over-year growth rate ranged between 4% and 6% in the major home price indices. The various measures of price growth are telling a consistent story that the market is cooling from what was an overheated situation in many areas, even though the home price indicators differ in methodologies and data sources (for example, the FHFA index only uses GSE loans, while the Case-Shiller index includes many jumbos and other types of loans). The Case-Shiller index is the weakest, consistent with sales listing data indicating a weaker market for more expensive homes.

Sources: CoreLogic Case-Shiller/FHFA/Moody's Analytics/Arch MI



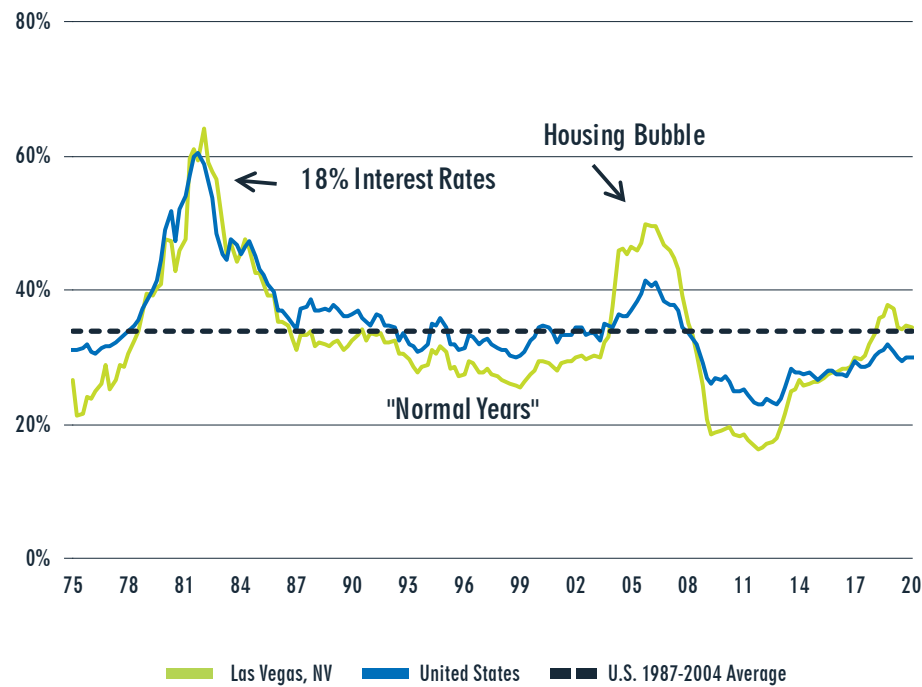
Home prices are up in all 50 states over the past year. The fastest growth in home prices was in Idaho, Arizona, Montana, New Mexico and Wyoming. The slowest growth was in Hawaii, Illinois, North Dakota, Alaska and Iowa.

Sources: FHFA All-Transactions HPI/Moody's Analytics/Arch MI

SA stands for Seasonally Adjusted.

Housing and Mortgage Market Indicators

PERCENTAGE OF MEDIAN INCOME NEEDED FOR PAYMENTS ON A MEDIAN-PRICED HOME

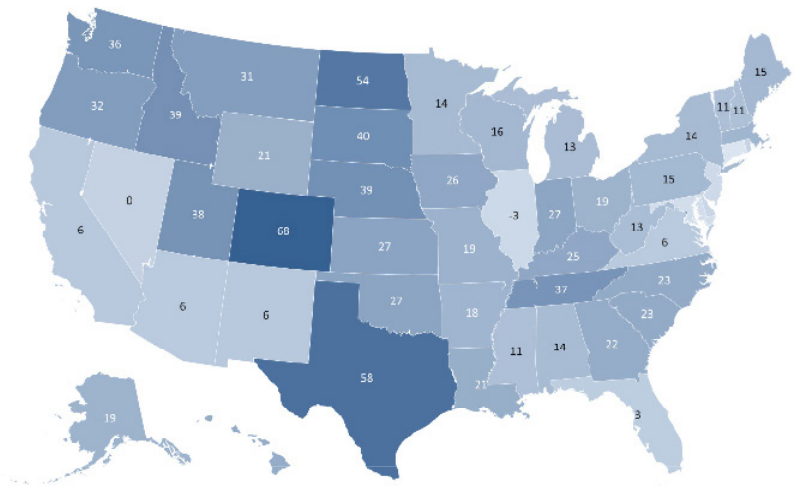


Housing affordability improved and remains better than historic norms nationally. Arch MI's affordability measure is the percentage of a median income needed to make monthly payments on a median-priced home. **For the U.S., it is 30%, which is 4% lower than the average** from the pre-housing bubble years (1987–2004). This is not based on actual loans, so we call it our Hypothetical Median Debt-to-Income (HMDTI) ratio. It doesn't include non-mortgage debt payments (auto, student, etc.), so it is an estimate of a front-end DTI. Our monthly mortgage payment calculations are based on pre-tax median household income, assuming a 10% down payment, 1.75% escrow for expenses (insurance, dues and property taxes) and the prevailing mortgage rate plus 0.75% for mortgage insurance and risk add-ons. Please see page 14 for a state-level map.

Sources: U.S. Census Bureau/Freddie Mac/National Association of REALTORS (NAR)®/Arch MI

Housing and Mortgage Market Indicators

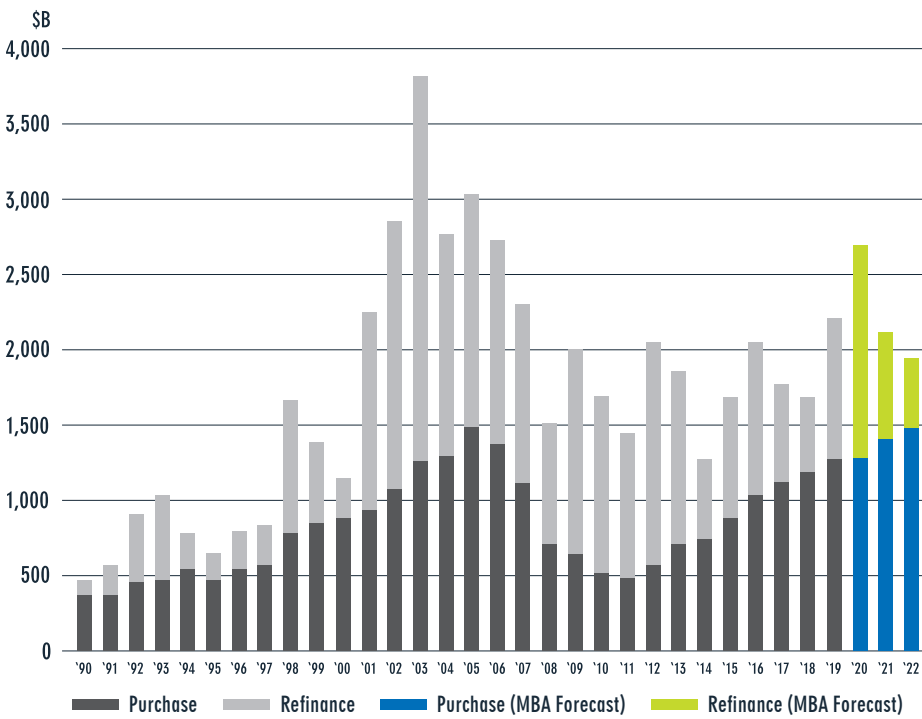
HOME PRICE PERCENTAGE CHANGE FROM PRIOR PEAK (2005–2008)



Home prices are still below the prior peak in six states. House prices have increased rapidly since bottoming out in 2012 and have surpassed their prior peak levels nationally; however, growth has been uneven. The **largest cumulative home price growth since home prices peaked around 2006** (we use the peak for each state, which varies by quarter) **is in Colorado, followed by Texas and North Dakota.** As of the end of the first quarter of 2020, six states had house prices lower than their prior peaks, with Connecticut and Maryland still lower by 11% and 7%, respectively. Values shown are in nominal (not inflation-adjusted) terms. To adjust for inflation, simply subtract the 27% cumulative inflation in consumer prices since 2006. Inflation-adjusted home prices are still below their pre-crisis peak in most areas.

Sources: FHFA/Moody's Analytics/Arch MI

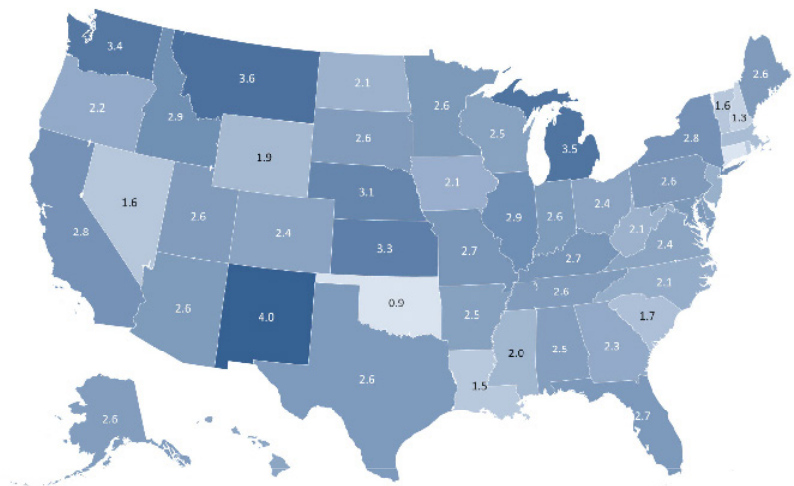
ORIGINATIONS IN MILLIONS OF \$



Future mortgage originations likely to tilt toward purchase loans. The dollar volume of purchase mortgage originations is projected to continue its upward trend since the start of the housing recovery. Refis are supported by record low mortgage rates, which are not expected to increase and could even drift lower. Alternatively, if market expectations of global growth improve, the 30-year fixed mortgage rate typically increases.

Source: Mortgage Bankers Association (MBA)

ANNUAL PERCENTAGE CHANGE IN PER CAPITA INCOME



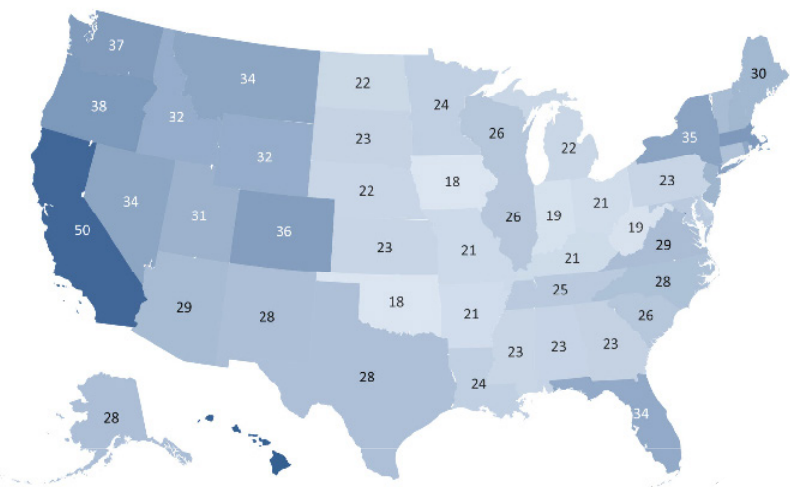
Income growth picked up in Q1, but is uneven. Income growth is an important driver of housing demand. The year-over-year **change in per-capita income was strongest in New Mexico**, followed by Montana and Michigan. It was weakest in Connecticut and Oklahoma.

Sources: U.S. Bureau of Economic Analysis/ U.S. Census Bureau/Moody's Analytics/Arch MI

Housing and Mortgage Market Indicators

PERCENTAGE OF MEDIAN INCOME NEEDED FOR PAYMENTS ON A MEDIAN-PRICED HOME

CURRENT VALUES FOR ALL STATES

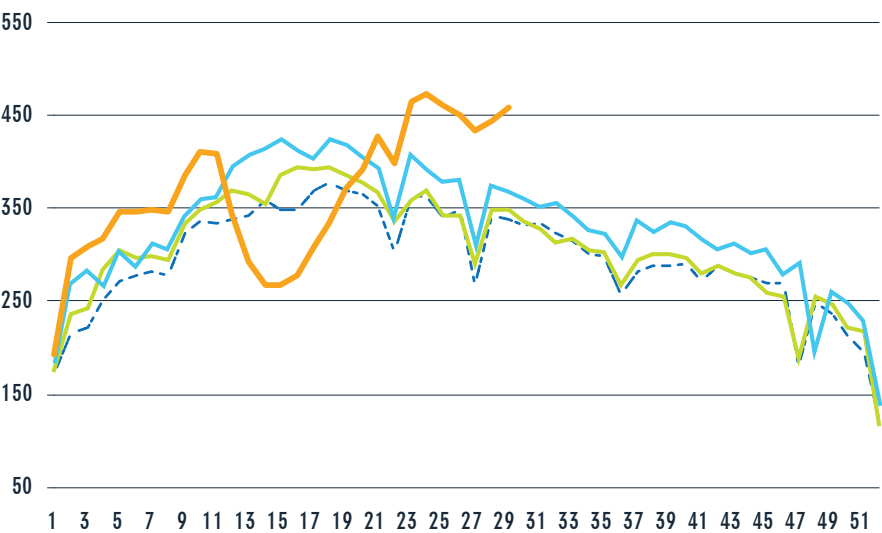


Affordability is an issue in the West. The percentage of median income needed to make monthly mortgage payments on a median-priced home varies widely. This hypothetical DTI ratio is the lowest in Iowa and Oklahoma. Our mortgage payment calculations are based on pre-tax median household income, assuming a 10% down payment, escrow of annual expenses of roughly 1.75% of the initial home price (insurance, dues and property taxes, which we vary by state) and the prevailing 30-year fixed mortgage rate plus 0.75% to cover mortgage insurance and risk add-ons. It is “hypothetical” because it is not based on actual loan DTIs. It doesn’t include non-mortgage debt payments (auto, student, etc.), so it is an estimate of a front-end DTI.

Sources: U.S. Census Bureau/Freddie Mac/ NAR/Moody’s Analytics/Arch MI

Housing and Mortgage Market Indicators

MBA MORTGAGE PURCHASE APPLICATION INDEX



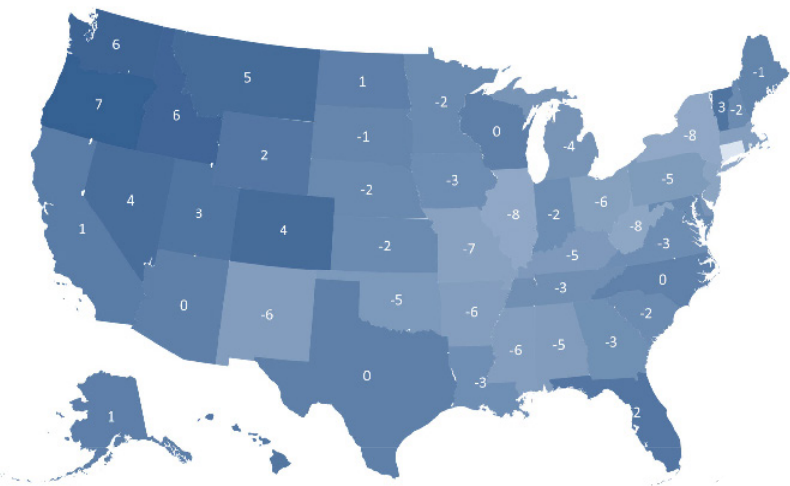
Purchase mortgage applications are at 11-year highs for this time of year. The weekly MBA purchase mortgage applications index (for conventional loans) has recovered from the early spring dip and is 24% higher than a year ago.

Sources: MBA/Arch MI

Week of the Year (not seasonally adjusted)

2017 2018 2019 2020

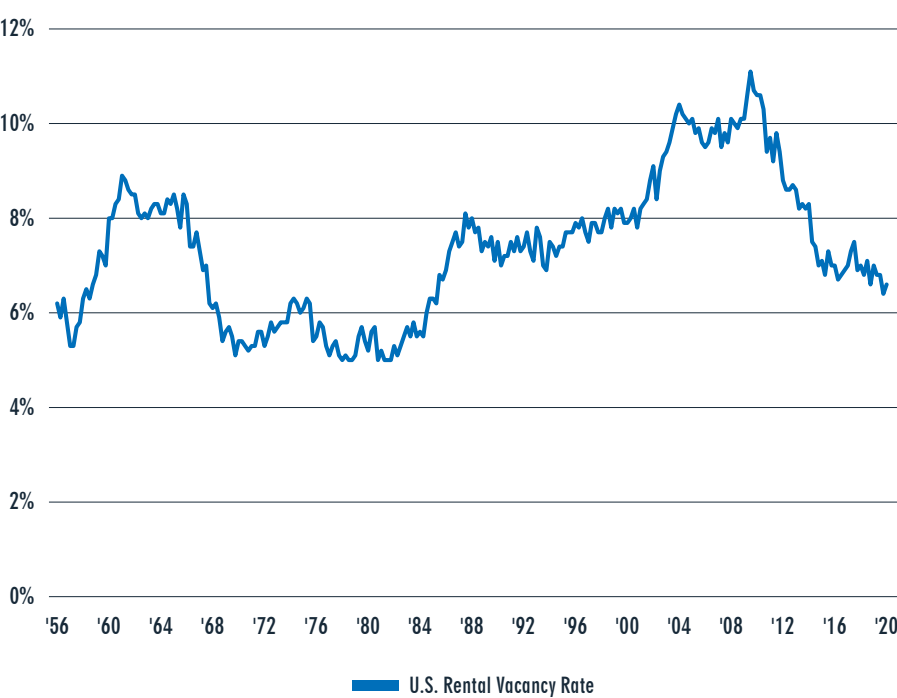
DIFFERENCE IN PERCENTAGE OF MEDIAN INCOME NEEDED NOW VS. NORMAL YEARS



Affordability is far worse now than historic norms in the West. This chart shows the percentage of median income needed for monthly mortgage payments on a median-priced home (shown above) minus the average from more normal years between 1987 and 2004. Oregon is now the worst state compared to its 1987–2004 average affordability, followed by Idaho and Washington. Affordability is better now than during 1987–2004 in 32 states, led by Connecticut, Illinois and New York.

Sources: U.S. Census Bureau/Freddie Mac/ NAR/Moody’s Analytics/Arch MI

U.S. RENTAL VACANCY RATE

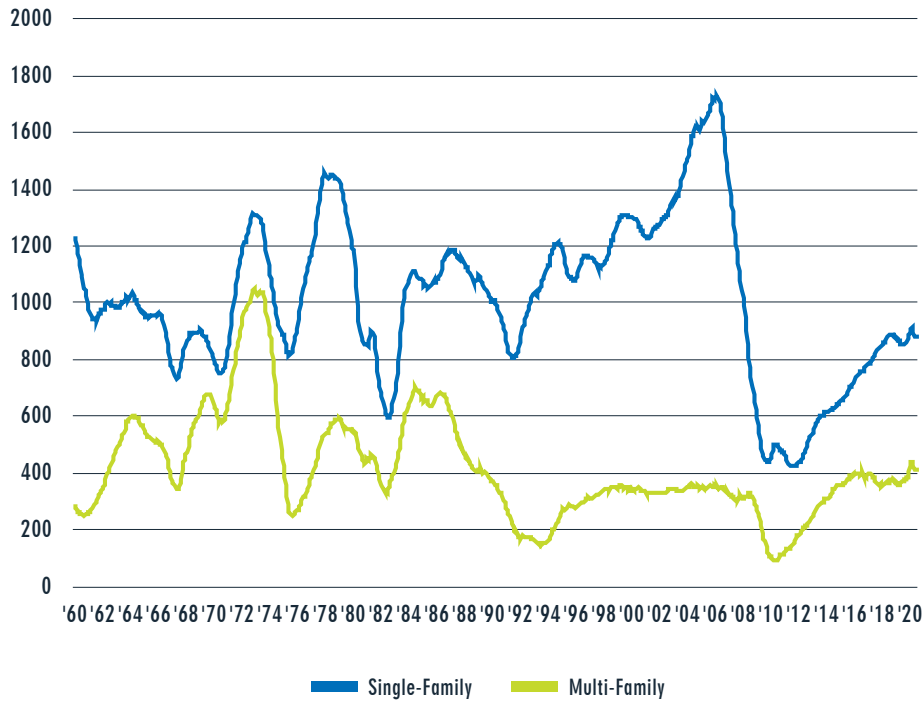


The U.S. rental vacancy rate has bounced around the lowest level in more than three decades at 6.6% in the first quarter. Sustained low rental vacancy rates are another indicator of how tight the housing market was just prior to the pandemic.

Sources: U.S. Census Bureau/Moody’s Analytics/Arch MI

Housing and Mortgage Market Indicators

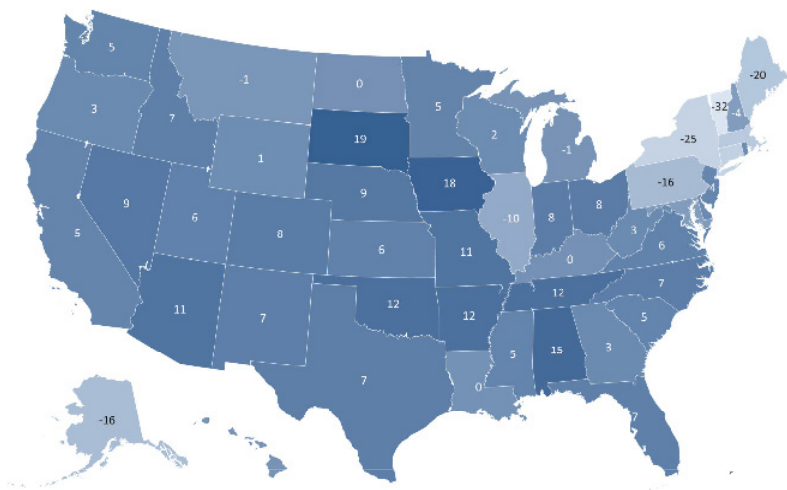
ANNUAL HOUSING STARTS, IN THOUSANDS



Housing starts likely bottomed out during the peak of the lockdowns. Both single-family and multi-family housing starts decreased 4% nationally from a year ago in June. Single-family starts were 831,000 units (seasonally adjusted annual rate) and multi-family starts were 355,000 units a year. The chart smooths out highly volatile monthly data by taking a 12-month moving average.

Sources: U.S. Census Bureau/Moody's Analytics/Arch MI

ANNUAL PERCENTAGE CHANGE IN HOUSING STARTS

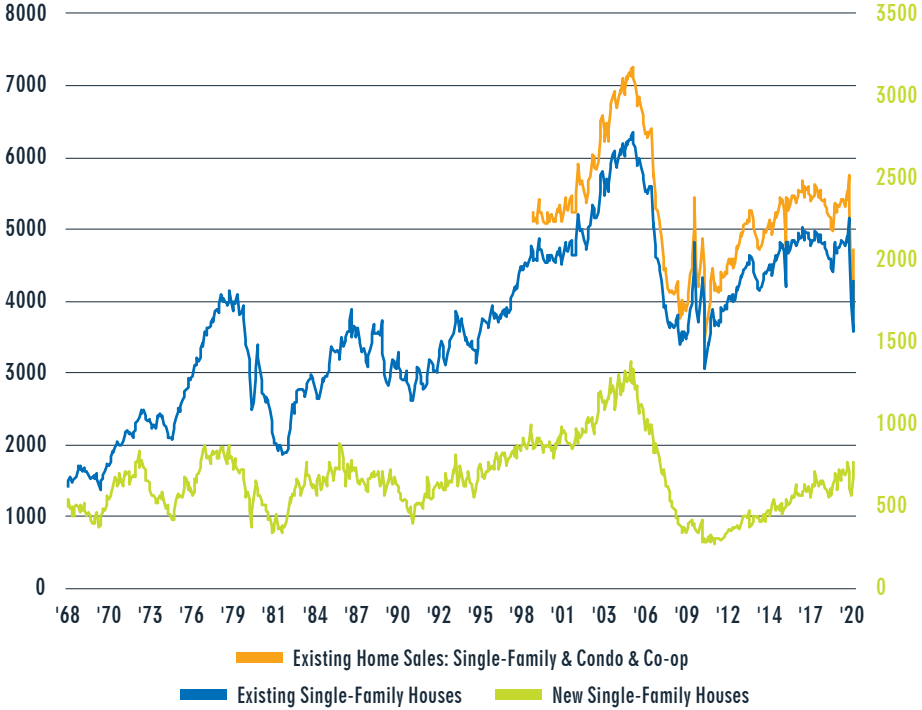


Housing starts appear strongest in the East and South. The growth in Single-Family Housing Starts (through May) is weakest in Vermont, the District of Columbia and New York. **Housing starts increased the most in South Dakota**, followed by Iowa and Alabama. To get a clearer understanding of the trend, which is unlike numbers seen elsewhere, we smooth the data to dampen short-term volatility due to weather, survey limitations, etc., by showing the changes in the 12-month moving average.

Sources: U.S. Census Bureau/Moody's Analytics/Arch MI

Housing and Mortgage Market Indicators

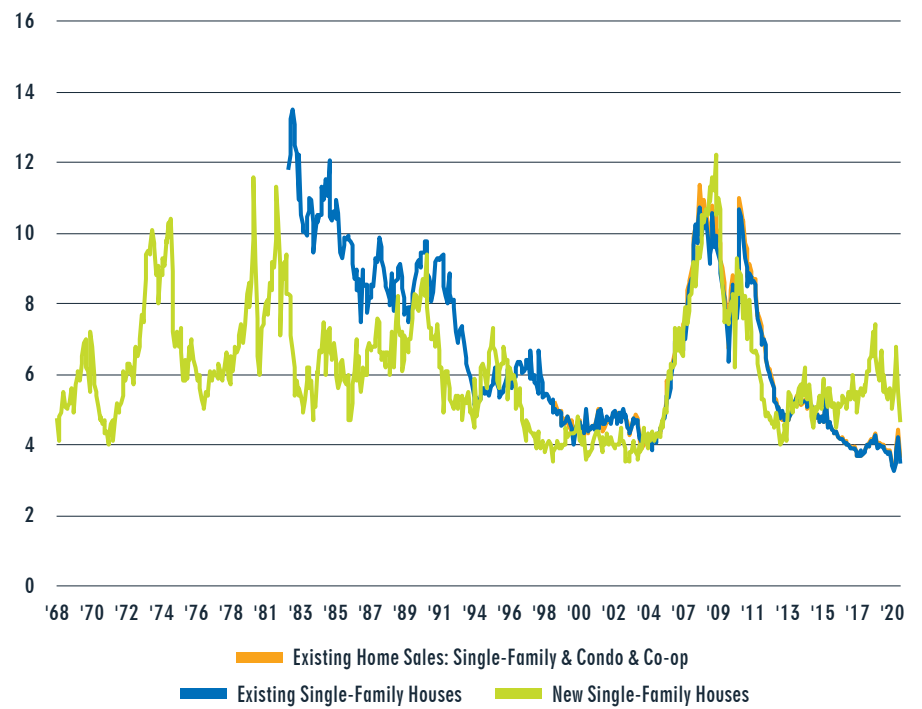
NEW AND EXISTING HOME SALES IN THOUSANDS



Both new and existing home sales are bouncing back. Sales of existing homes (including single-family, condos and co-ops) were 4.7 million units (after annualizing the monthly number) in June; a decrease of 11% compared to the same period last year, in part due to record low supply. Existing home sales are based on the closing of contracts signed one to two months earlier. Sales of newly constructed homes were 776,000 units (annualized rate), up 7% from a year ago.

Sources: NAR/U.S. Census Bureau/Moody's Analytics/Arch MI

MONTHS' SUPPLY OF HOMES FOR SALE



Home inventory remains very low. The months' supply of existing homes (including single-family, condos and co-ops) for sale (total current listings ÷ last month's sales) was 3.7 months in June, compared to 4.0 months a year ago. The months' supply of just existing single-family homes (excluding condos, etc.) for sale decreased from 4.0 a year ago to 3.5. The months' supply of new homes for sale, shown in green, declined sharply to 4.7 months. This is much lower than its post-crisis high of 7.4 months reached at the end of 2018 and lower than its long-term average of 6.1 months.

Sources: NAR/Moody's Analytics/Arch MI

ARCH MI'S

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