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Housing and Mortgage Market Review

HaMMR – Winter 2022

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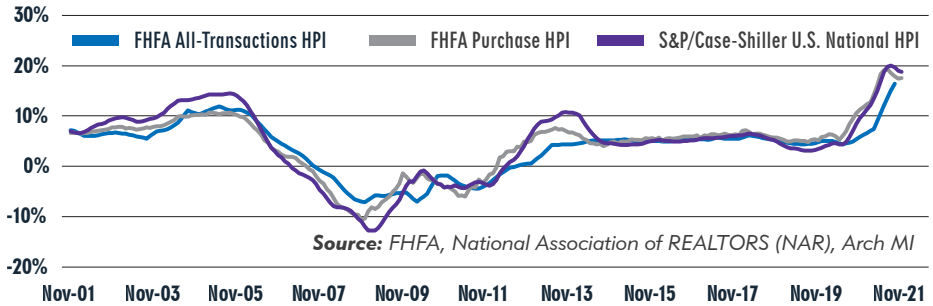
How It Started, How It's Going

By Parker Ross, Senior Vice President, Chief Economist, Arch Capital Services LLC

Following a whirlwind of a year for the housing market, we felt it would be helpful to review the crucial developments of 2021 to set the stage for what to expect in 2022. We anticipate some key factors will generate new trends in the year ahead, while some of the emerging housing themes that evolved over 2021 will continue this year.

Home prices have continued to rise at a rapid and unprecedented pace. Going into the end of 2021, home prices were up double digits year-over-year regardless of the measure of home prices referenced. Through the third quarter of 2021, the Federal Housing Finance Agency (FHFA) All-Transactions Index increased 16% year-over-year at the national level, while prices through November 2021 were up year-over-year by 18% for the FHFA Purchase-Only Index and 19% for the Standard & Poor's (S&P) CoreLogic Case-Shiller U.S. National Home Price Index® (Figure 1).

Figure 1: National HPI Indexes - Year-Over-Year Growth



Source: *FHFA, National Association of REALTORS (NAR), Arch MI*

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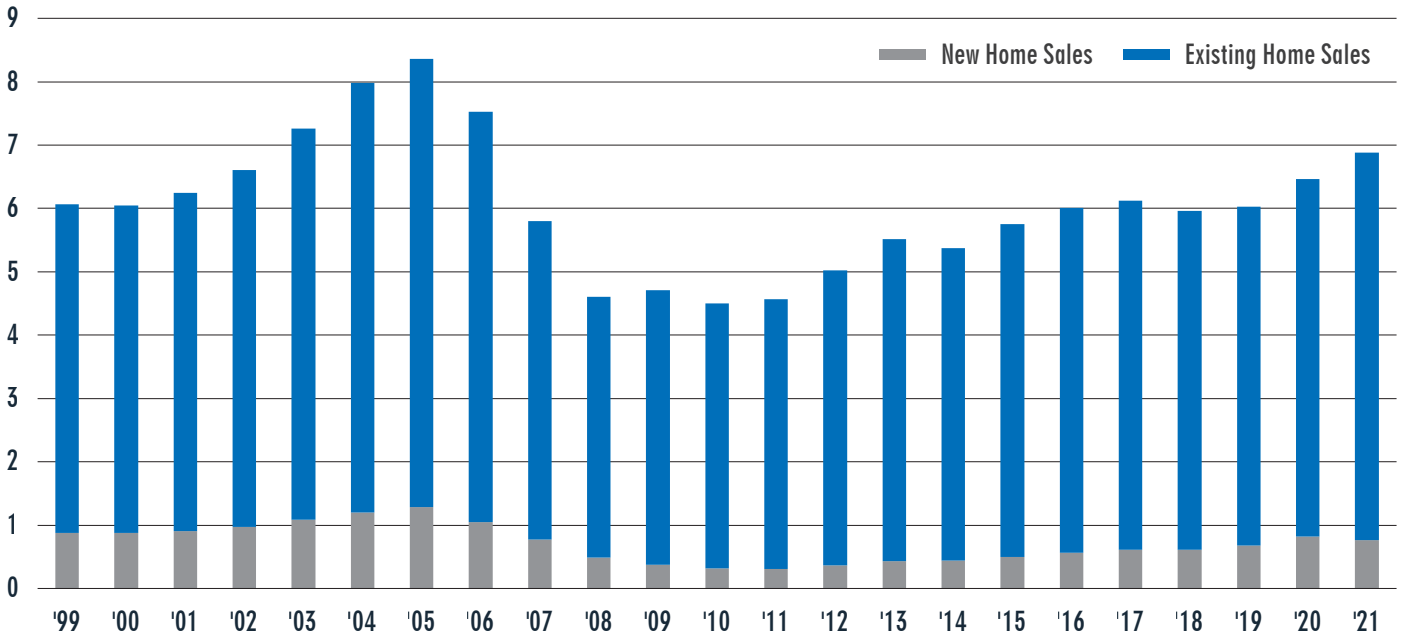
How It Started, How It's Going *(continued from page 1)*

Although the pace of appreciation has slowed since peaking at close to 20% over the summer, according to the monthly house price indexes, the current pace still exceeds any other 12-month period in the history of the price indexes. We expect home-price appreciation to continue to decelerate meaningfully in 2022 as affordability increasingly becomes a binding constraint.

Price increases were buoyed by an extremely limited inventory of existing homes for sale and still-robust housing demand. Existing home sales climbed to a 15-year high of 6.1 million (Figure 2), which resulted in the months' supply of existing homes for sale falling to a record low of 2.1 months. Historically, balanced market conditions have been represented by a four-to-five months' supply of existing homes for sale. With supply at 2.1 months, the current inventory would need to effectively double, given the current pace of sales, to reach a balanced state. New home sales also remained near 15-year highs in 2021, despite declining 7% year-over-year to 763,000 as many homebuilders purposefully capped sales activity to prevent the backlog of homes under construction from growing further until supply and labor constraints ease.

Figure 2: Homes Sales by Year (millions)



Source: *NAR, U.S. Census Bureau, Arch MI*

In response to the challenges homebuilders have had with shortages of materials and labor, prices for residential construction goods and services have surged by a respective 24% and 20% since the beginning of the pandemic. Despite challenges, builders have generally been able to pass along these higher costs to homebuyers via higher new home prices. Meanwhile, homebuyers have also been confronted with inflation accelerating to rates not seen for decades, in large part due to supply constraints limiting the ability of producers to respond to the recent surge in demand. With consumer price inflation up 7.0% as of December 2021, the ability of potential homebuyers to save for a down payment has been disrupted by the need to spend more on core goods and services.

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How It Started, How It's Going *(continued from page 3)*

Many of the supply constraints causing rapid price gains have been created by successive waves of COVID-19 infections, which have repeatedly disrupted goods production in many industries. Over the course of 2022, many of these supply constraints should ease as production continues to recover. Consequently, we expect inflation to slow but remain well above the pre-pandemic trend in 2022. However, the discovery of more severe variants of COVID-19 remains a key downside risk to monitor.

While inflation has been a key headwind for both homebuyers and homebuilders, the labor market has recovered rapidly and is beginning to produce above-trend wage growth as businesses struggle to fill open positions. After the unemployment rate ended 2020 at 6.7%, it has since recovered to 3.9% as of December 2021 — within shouting distance of its pre-pandemic level of 3.5%. As a result of the tight labor market, wage growth for non-managers has climbed by an average annualized rate of nearly 6% since the beginning of the pandemic compared with a rate closer to 2.5% in the decade preceding the pandemic. Despite the tight job market, labor force growth has been relatively slow during the recovery from the pandemic in large part due to demographic factors. We expect slow labor force growth and tightness to persist in 2022, which will produce continued above-trend wage growth.

The Federal Reserve responded to the tight labor market by tapering its asset purchases in November 2021, then accelerated the pace of tapering in December in response to stronger inflation and employment data. Looking forward, the Fed is expected to end its asset purchases and raise rates starting in March based on the latest market-implied odds, followed by quarterly hikes over the remainder of 2022. In response to the expectation of rising rates, 10-year U.S. Treasury yields have climbed above 1.90% for the first time since the pandemic started and mortgage rates have followed — increasing from a record low annual average of 2.95% in 2021 to around 3.60%. The rise in rates has already added about $100 to the typical monthly mortgage payment since the beginning of the year on top of the roughly $200 increase that occurred in 2021 due to higher home prices. We do not expect the recent rapid increase in mortgage rates to continue, but we do see a modest increase from current levels by the end of the year.

In the year ahead, housing demand fundamentals will remain strong, supported by a wave of Millennials entering prime homebuying years, strong wage growth, the persistence of remote work, savings accumulated during the pandemic, record levels of home equity and the likelihood that some buyers will rush to act before rates rise. Some demand headwinds to keep an eye on as the year develops include how quickly rates rise, the removal of unprecedented stimulus, the end of rent and student loan forbearance programs and above-trend inflation which will eat into rising incomes and lift homebuilding costs.

The supply of existing homes for sale will rise from record-low levels as sellers cash in their newfound home equity and move to another housing market or right-size within their existing area. A key downside risk to watch in 2022 regarding the recovery in the supply of existing homes for sale is how much the limited supply becomes self-reinforcing as potential sellers hold off on listing their homes because they aren't confident in their ability to find a suitable new home. Construction activity will remain elevated as builders work through backlogs and continue to ramp up production to meet demand. Ultimately, the level of completions will not be enough to resolve the housing shortage that has been developing for years. A key downside risk for construction activity is the potential for materials and labor supply constraints to persist longer than expected, particularly if any new and more severe COVID-19 variants emerge.

First-Time Homebuyer Demand Will Face Challenges, but Remain Strong

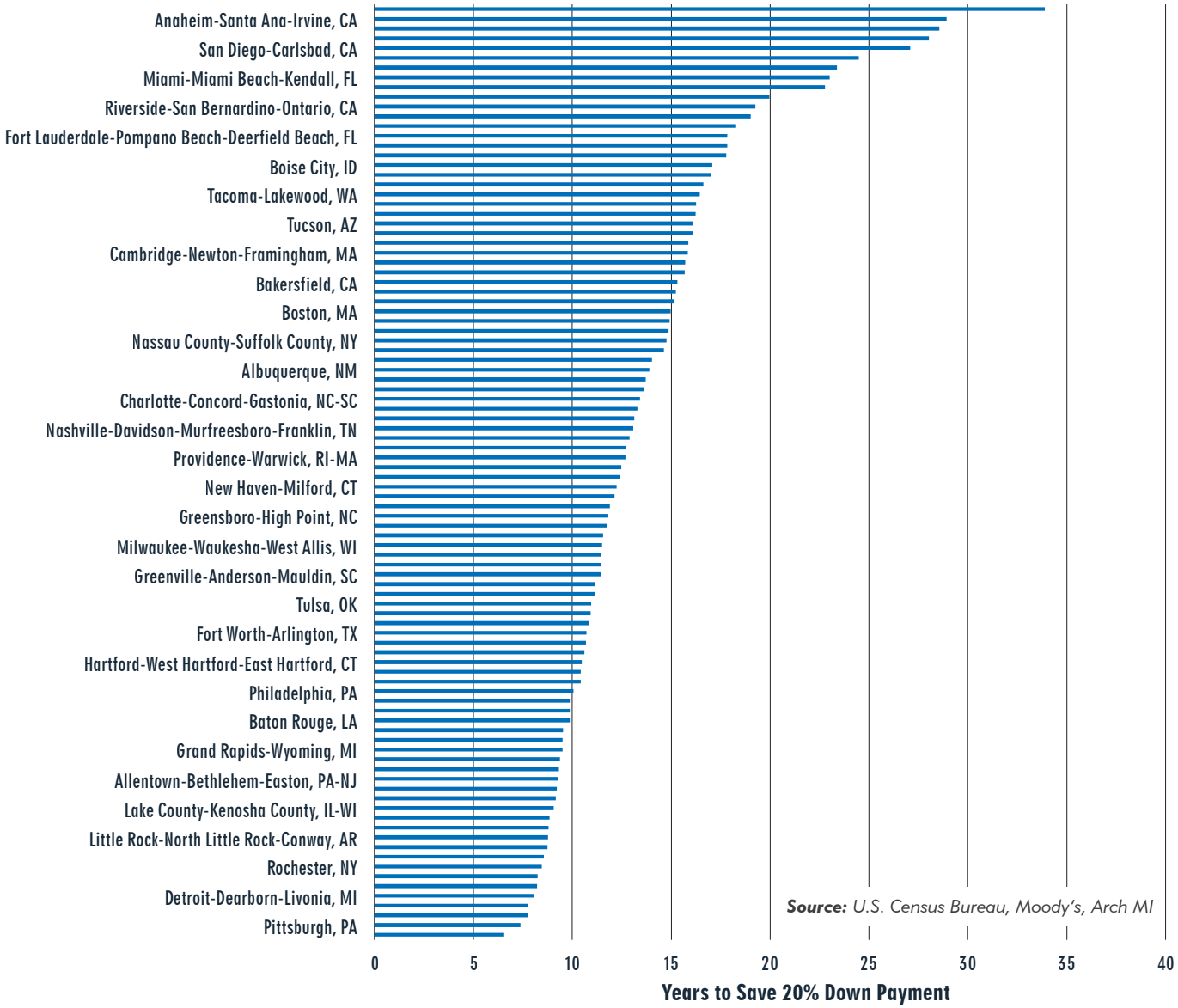
First-time homebuyers accounted for 34% of existing home purchases in 2021, up from 31% in 2020 and the highest share since 2017, according to the National Association of Realtors® (NAR). The rising share of first-time homebuyers is likely driven by the continued surge of Millennials reaching prime homebuying age and the savings they accumulated during the pandemic. The typical age of first-time homebuyers was unchanged at 33 years old, while repeat buyers were typically 56 years old, an all-time high according to NAR. Many potential first-time homebuyers were able to accumulate significant savings during the pandemic. We estimate households collectively saved over $2.5 trillion due to a combination of stimulus payments, unemployment insurance benefits, reduced consumption and rent and student loan forbearance. All of these factors boosting savings in 2021 will end this year, and rising rents and above-trend inflation will put additional pressure on the accumulation of further savings for down payments.

First-time buyers will continue to be a key driver of housing demand in 2022 but will face some headwinds, particularly from an affordability perspective. Their incomes are generally lower than repeat buyers — causing them to be priced out of markets earlier due to affordability constraints — and they have had less time to accumulate savings for a down payment. One major misconception among first-time homebuyers is the amount of savings required for a down payment. According to a recent study by the Urban Institute, 65% of renters believed a down payment of more than 15% was needed, with nearly 40% indicating that more than 20% was required.

In reality, homebuyers can put down as little as 3% with the support of private mortgage insurance (PMI) — or through Fannie Mae and Freddie Mac — and as little as 3.5% with an FHA loan. Additionally, first-time homebuyers can turn to more than 2,500 programs across the U.S. for down payment assistance grants and loans. It would take the typical Millennial household about 10 years to save up 20% of the purchase price of a typical home. If the savings target is instead reduced to a more realistic 5%, the typical savings timeline is reduced to about two-and-a-half years.

The timeline required to save varies greatly by metro area, depending on a combination of each area's estimated median Millennial income and median existing home price (Figure 3). For simplicity, we assume that the typical Millennial household saves 7.5% of their income, roughly in line with the national savings rate trend prior to the pandemic. On the quicker end of the savings timeline to accumulate enough savings for a 20% down payment are metro areas like Pittsburgh, Pennsylvania (seven years), and St. Louis, Missouri (eight years). Typical Millennial households in those cities earn an estimated $78,000 and median home prices are also on the more affordable end of the spectrum at a respective $191,000 and $227,000. At the longer end of the savings timeline are metro areas with substantial incomes, but substantially higher home prices as well. The estimated median Millennial household income in San Francisco, California, is $181,000, but the median home price is roughly $1.9 million, equating to an agonizing 28 years to save for a 20% down payment.

Figure 3: Years Required for Millennials to Save a 20% Down Payment by MSA



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First-Time Homebuyer Demand Will Face Challenges, but Remain Strong

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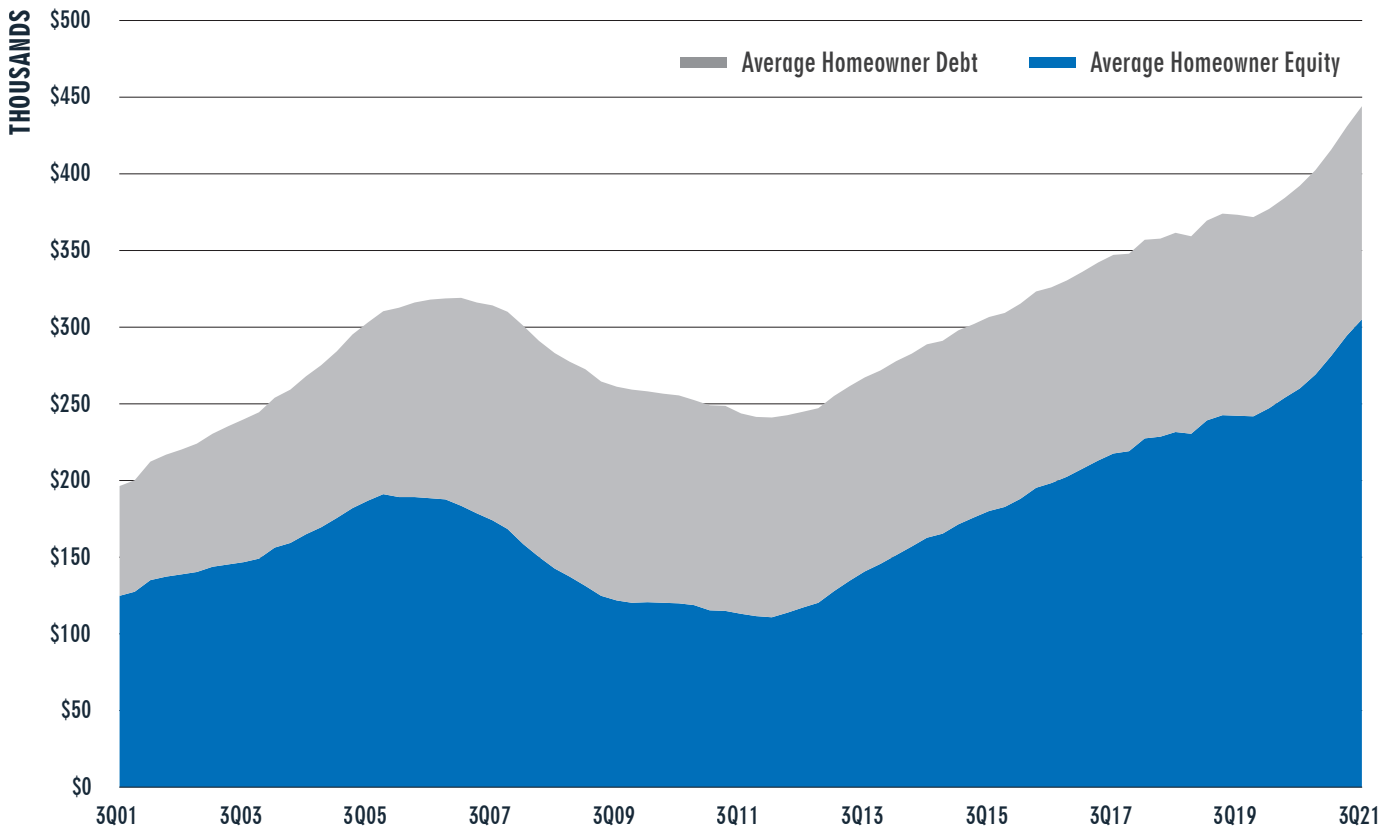
Although first-time homebuyers are likely well-positioned to make down payments on homes with their accumulated savings in most markets, they will be competing with repeat homebuyers in 2022 who have amassed more significant home equity to support strong offers. The average homeowner's equity was roughly $300,000 in Q3 2021 (Figure 4), up from just over $100,000 10 years ago according to data from the Federal Reserve Board and U.S. Census Bureau. A decade is an important period of reference for homeowner equity as it roughly equates to the amount of time home sellers had lived in their homes as of 2020. However, seller tenure decreased to just eight years in 2021 according to NAR, an 11-year low and closer to the historical average of six to seven years, as more sellers decided to tap into their equity and move to a retirement destination, be closer to family or find a more appropriately sized home in their current market.

Given the prevalence of multiple bids on homes in the current market, it is also possible that first-time homebuyers will be going up against repeat buyers making all cash offers, which accounted for 17% of repeat buyer purchases in 2021, according to NAR. This presents another challenge for first-time buyers as sellers are generally less likely to accept a low down payment offer over an all-cash or a high down payment offer.

Figure 4: Homeowner Debt vs. Equity



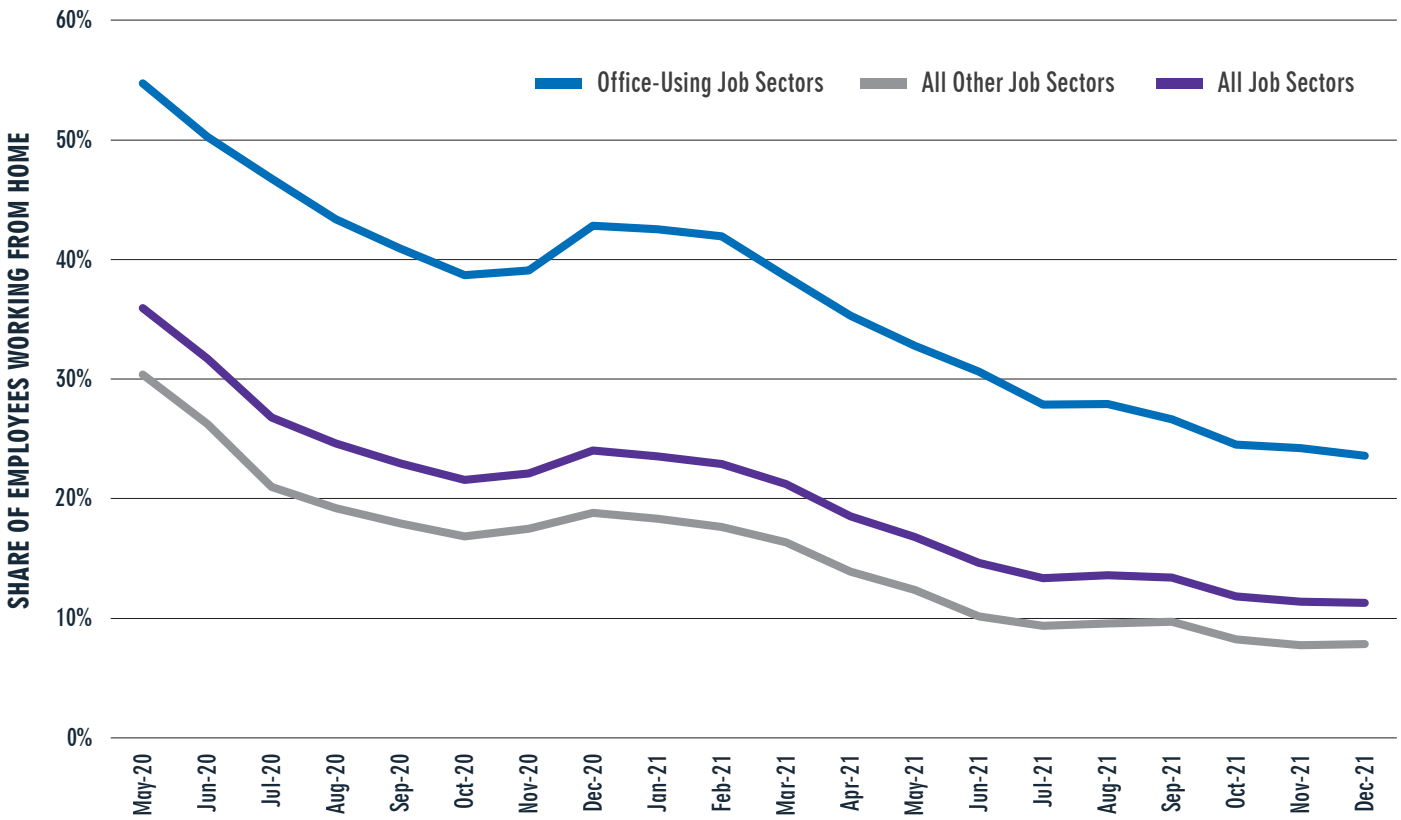
Source: *Federal Reserve Board, U.S. Census Bureau, Arch MI*

How Working from Home Is Reshaping the Housing Market

One of the most significant and persistent impacts of the pandemic for the housing market has been the flexibility to work from home. At the beginning of the pandemic, this flexibility caused many suburban markets outside of large cities to swell with renters looking for more space. In the nearly two years since the pandemic started, working from home has become an expected job arrangement. According to Pew Research, more than half of employed adults working from home because of the pandemic would prefer to work from home all or most of the time even after the pandemic ends. Given the difficulty businesses have had hiring workers, many appear to be responding by increasingly posting jobs as full-time remote. The share of remote job posts increased to 16.3% of global job posts by August 2021 from 1.9% at the start of the pandemic in March 2020, according to LinkedIn.

In response to the significant shifts wrought by the pandemic, the U.S. Bureau of Labor Statistics (BLS) in May 2020 added several questions to the Current Population Survey to help gauge the effects of the pandemic on the labor market. One of these questions asked whether people teleworked or worked from home because of the pandemic at any time during the previous four weeks. In May 2020, the first month this question was asked, 36% of all workers indicated that they had worked from home because of the pandemic (Figure 5). The actual peak in working from home likely occurred in March or April 2020 during the initial phase of the pandemic and began to ease with some companies returning to in-person work by May 2020.

Figure 5: Remote Work by Sector During the Pandemic



Source: *BLS, Arch MI*

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How Working from Home Is Reshaping the Housing Market

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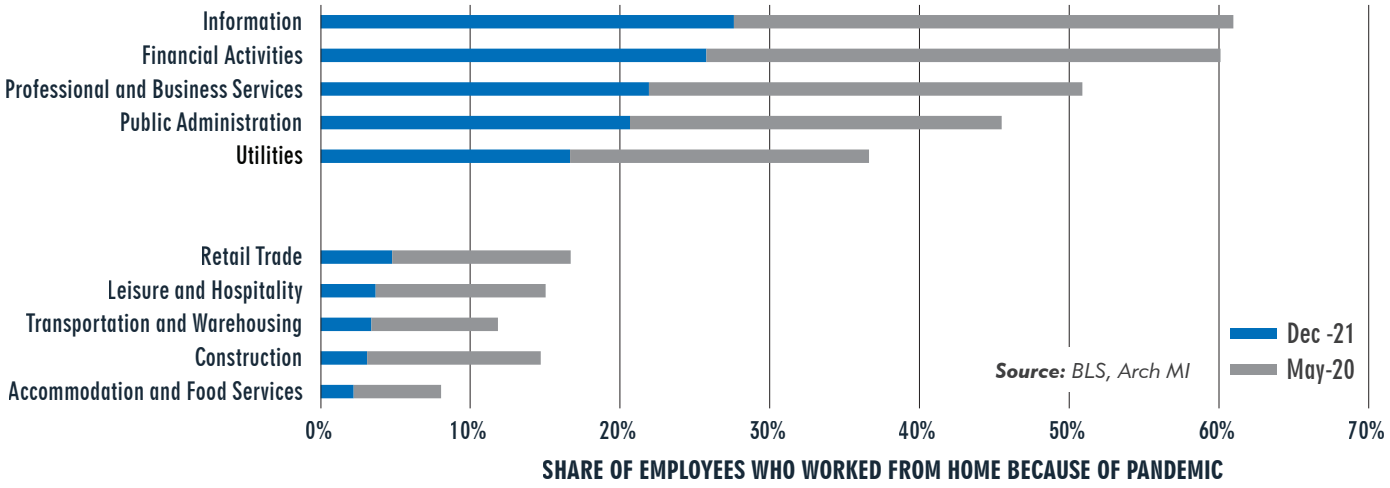
This shift to working from home varied greatly across job sectors as not all employees are able to do their work effectively from home. Accordingly, certain industries had an outsized share of workers reporting that they had worked from home: As of May 2020, the information, financial activities and professional and business services sectors led the way with 61%, 60% and 51%, respectively (Figure 6). Most of the employees in these industries work in offices, which typically enables a relatively seamless transition to working from home. However, a much smaller share of employees worked from home in industries where physical presence is required for most workers — accommodation and food services, transportation and warehousing and construction had the lowest share of remote workers with 8%, 12% and 15%, respectively. Those who were able to work from home in these industries are likely office workers as it would prove difficult to cook food or build a home remotely.

Figure 6: Remote Work by Sector

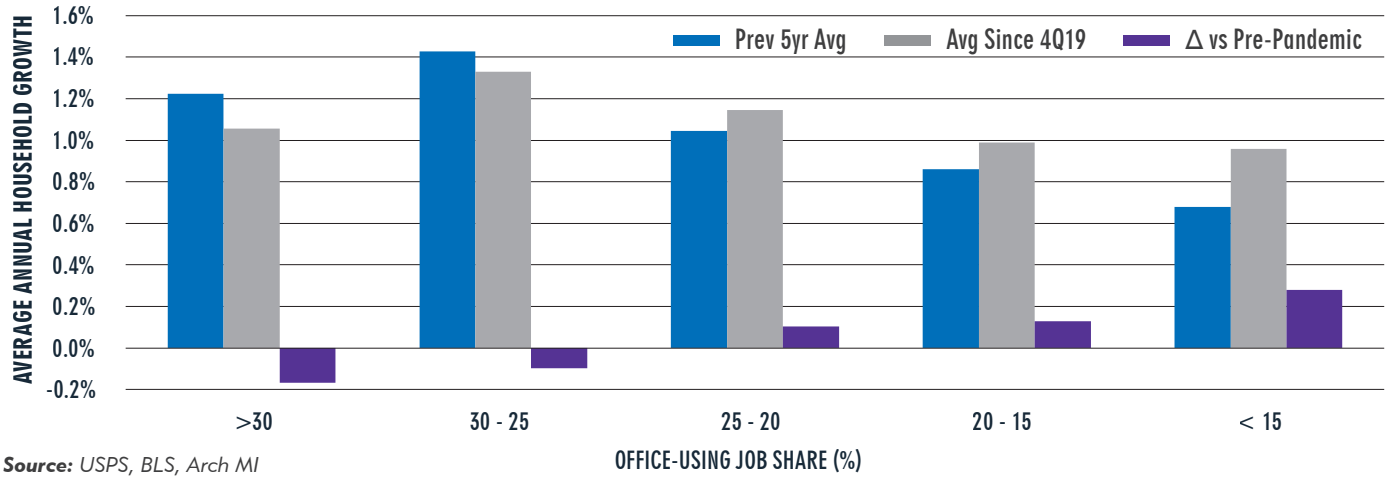


As people returned to work over the course of 2021, the share of employees working from home in office-using job sectors declined to a still-elevated 43% in December 2021 from 55% in May 2020 — compared to a decline to 26% from 36% over the same time period for all other industries (Figure 5). The longer the work-from-home trend continues, the more entrenched it is likely to become in the labor market. In turn, this will enable those who are able to work from home on a part-time or hybrid basis to move slightly farther away from job centers. Dual-income households may be less inclined to venture farther away from job centers than single workers, particularly if one of the workers in the household is required to commute into the office part-time. For workers who secure full-time remote jobs, their place of residence will be determined by affordability and personal preferences.

To gain some insight into how the transition to hybrid and remote work may be driving migration across the country, we looked at the change in the pace of metro-area household formation broken down by the share of office-using jobs as a percent of total jobs for each metro area. For a real-time measure of household formation, we consider U.S. Postal Service (USPS) Delivery Statistics data on the number of residents actively receiving mail at established addresses. The USPS considers an address active if mail has been picked up within the previous 90 days. We analyzed the USPS Delivery Statistics data at the metro level, calculating the average annual growth in active addresses during 2014–2019 (the pre-pandemic period) as well as the average annualized growth since the fourth quarter of 2019 (the pandemic period). We then compared the growth rates to understand which areas accelerated the most during the pandemic period and which slowed or contracted.

Nationally, office-using jobs account for about 22% of the workforce and average annual household formation accelerated from 0.89% during the five years preceding the pandemic to 1.04% over the past two years. For metro areas where the share of office-using jobs accounted for more than 25% of the total workforce, the average annual household growth rate slowed during the pandemic relative to the pre-pandemic pace (Figure 7). Despite slowing, many of these metro areas remain some of the fastest growing in the nation. For example, the Austin, Texas, metro area has an office-using share of 29% and although its average annual household growth rate slowed slightly to 3.4% during the pandemic from 3.5% during the five years preceding the pandemic, it remains one of the five fastest-growing metro areas in the U.S. However, the metro area with the highest concentration of office jobs — San Francisco, California, at 45% — has experienced a meaningful slowdown in household growth to 0.3% during the pandemic from 0.7% previously.

Figure 7: Household Growth Accelerated in MSAs with Lower Share of Office-Using Job



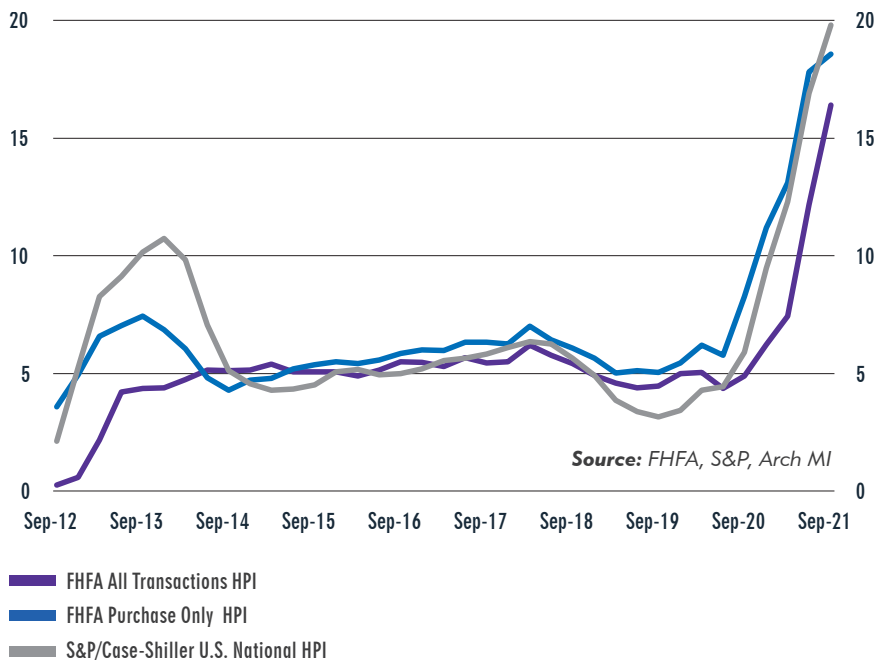
Source: *USPS, BLS, Arch MI*

For metro areas where the share of office-using jobs was less than 25%, average annual household formation accelerated but remained generally slower than in the more office-oriented metro areas. This suggests that some workers have taken advantage of the flexibility to work remotely and moved to metro areas that traditionally have fewer office workers. Additionally, the increase in retirements during the pandemic has also likely driven some of the shift away from traditional job centers. For instance, the two fastest-growing metro areas in the nation during the pandemic, according to the USPS data, are St. George, Utah, and Myrtle Beach, South Carolina, top retirement destinations which are both on the lower end of office job share with 13% and 16%, respectively. They also happen to be the top two metro areas for growth in the population aged 65 years and over, according to the U.S. Census Bureau.

Housing affordability constraints are typically not as great a concern for migrating workers and relocating retirees, as office-using employees typically earn higher incomes than their non-office peers and retirees generally have meaningful savings that enable them to purchase homes entirely with cash. We expect these trends to be key drivers of housing demand in the years ahead, particularly for some popular destination markets, given the rising share of remote job postings and the incoming wave of retirements due to the aging Baby-Boomer population. The resulting impact for home-price appreciation will be less noticeable for the broader national market and should instead continue to be concentrated in select regional markets.

Housing and Mortgage Market Indicators

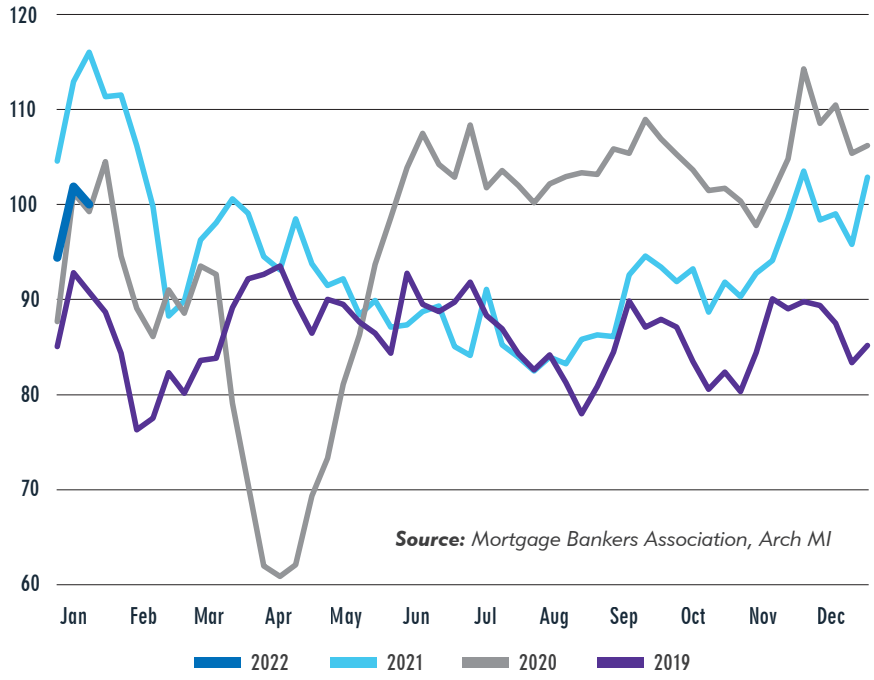
YEAR-OVER-YEAR PERCENTAGE CHANGE IN HOME PRICES



National home prices continue to rise rapidly. Home-price growth in Q3 2021 was strong across all three indices, with the FHFA purchase-only index increasing 18.5% year-over-year — its strongest quarter on record. While these home-price indicators differ in methodologies and data sources (the FHFA only uses GSE loans, while the U.S. Case-Shiller National Home Price Index includes many jumbo and other types of loans), they all reflect record year-over-year price gains for the quarter.

Sources: *S&P Case-Shiller/FHFA/Moody's Analytics/Arch MI*

MBA MORTGAGE PURCHASE APPLICATION INDEX

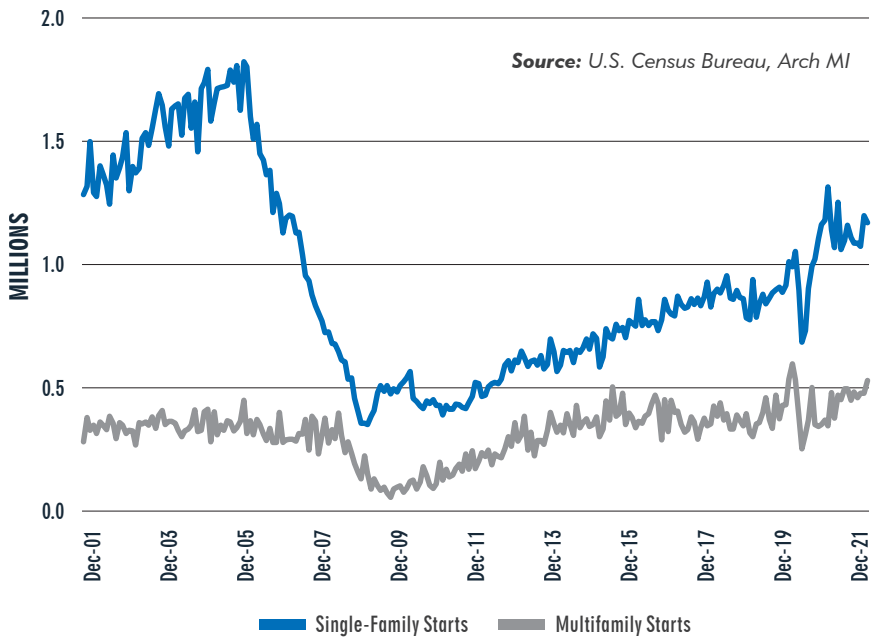


As of January 2022, mortgage purchase applications are up 1% compared with 2020, but down 11% year-over-year when activity was particularly elevated. Excluding 2021, this was the highest level of January mortgage purchase application activity since 2009. Going forward, rising U.S. Treasury yields are likely to lead to higher mortgage rates and become a modest headwind for purchase activity in the year ahead.

Sources: *MBA/Arch MI*

Housing and Mortgage Market Indicators

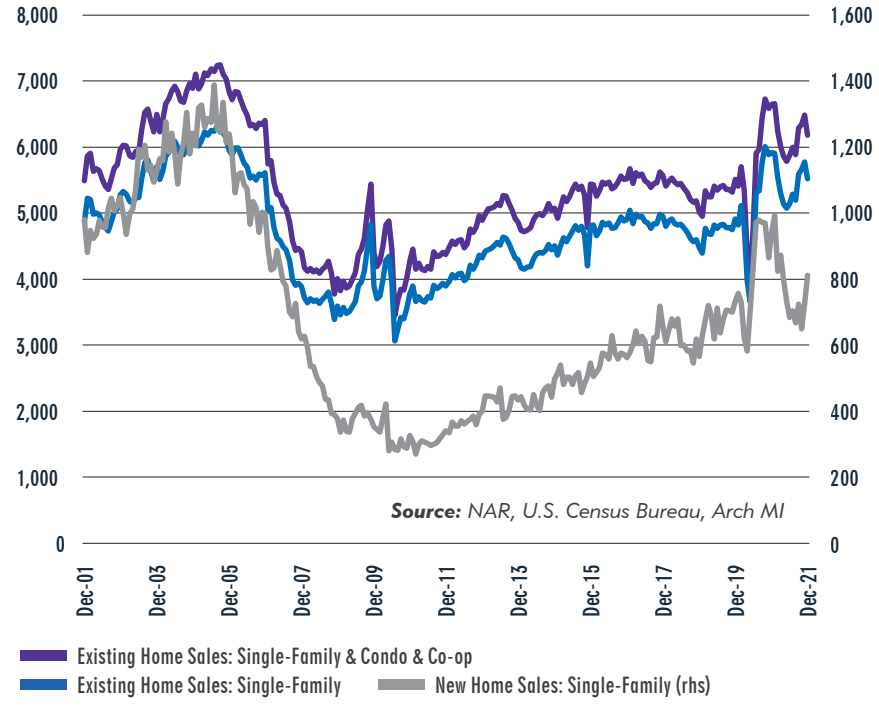
HOUSING STARTS, IN THOUSANDS — SEASONALLY ADJUSTED ANNUAL RATE



Single-family housing starts reached their highest level since 2007 in December 2020 at 1.3 million units (seasonally adjusted annual rate) and have remained elevated at about 1.2 million units as of December 2021. Despite supply constraints impacting construction activity, the current pace of single-family housing starts is nearly 25% above the pre-pandemic pace. Additionally, the pace of multi-family starts increased to about 530,000 units (annualized rate) in December, nearly 15% above the pre-pandemic pace.

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

NEW AND EXISTING HOME SALES, IN THOUSANDS — SEASONALLY ADJUSTED ANNUAL RATE

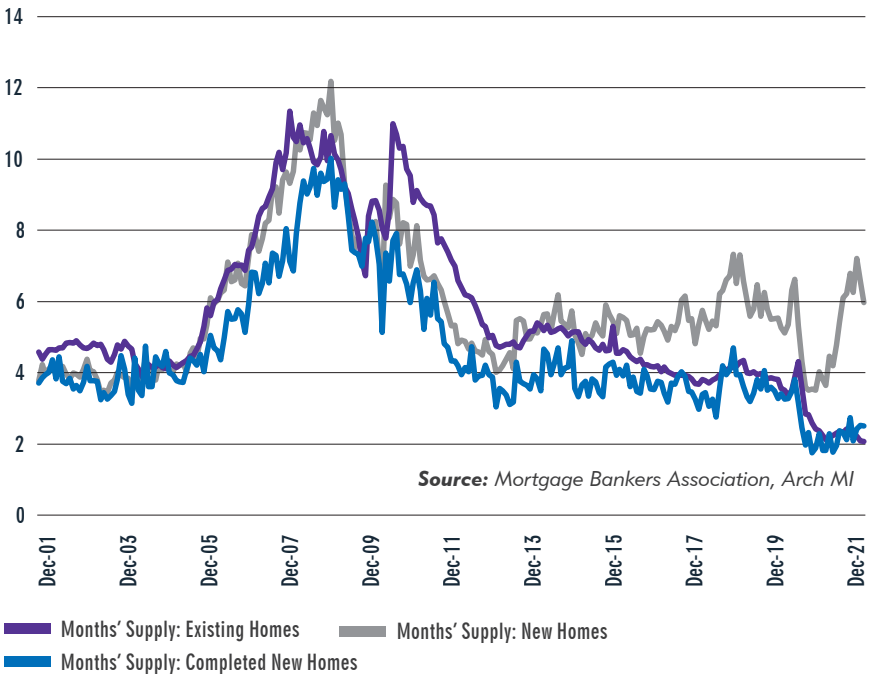


Sales of existing homes (including single-family, condos and co-ops) totaled 6.1 million units in 2021, which was 8% above 2020 sales and the highest since 2006. New home sales slowed to 763,000 in 2021, down 7% from 2020 but otherwise the highest level of sales since 2007. The pace of new home sales has been limited by labor and supply chain constraints, which has caused homebuilders to hold back sales activity to manage through these challenges. Existing home sales are based on the closing of contracts signed one to two months earlier, while new home sales are counted at the time of signing.

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

Housing and Mortgage Market Indicators

MONTHS' SUPPLY OF HOMES FOR SALE

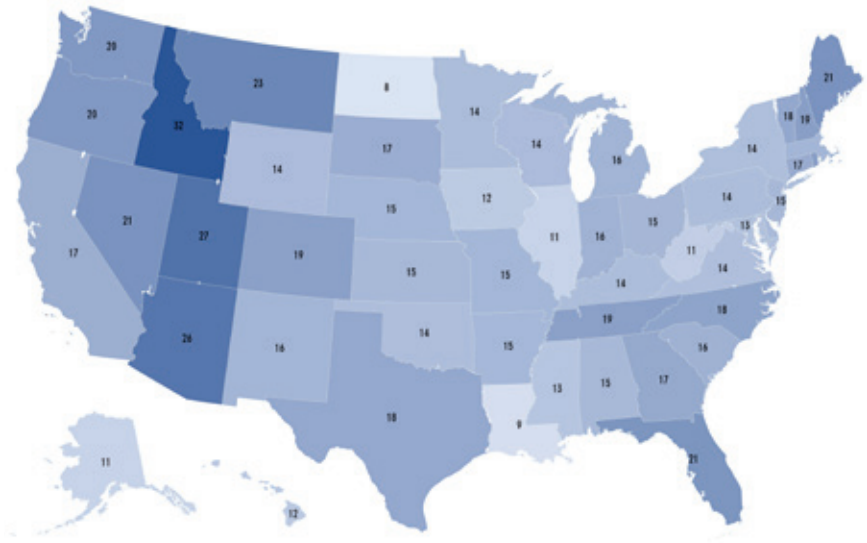


Source: *Mortgage Bankers Association, Arch MI*

The inventory of homes for sale remains near record lows. The months' supply of existing single-family homes for sale (total seasonally adjusted listings ÷ last month's seasonally adjusted annualized sales pace) was 2.1 months as of December 2021, down from an average of 3.1 months in 2020 and the pre-pandemic average of 4.5 months. The months' supply of new homes for sale dropped to 6.0 months in December from 7.2 months in October. However, an unusual share of the new home inventory comprises units still under construction and units not yet started due to builder backlogs. Considering only the inventory of completed homes for sale, the inventory was equivalent to 2.5 months of supply in December, down from an average of 2.6 months in 2020 and the pre-pandemic average of roughly 4 months.

Sources: *NAR/Moody's Analytics/Arch MI*

HOME PRICE GROWTH BY STATE: YEAR-OVER-YEAR (%)

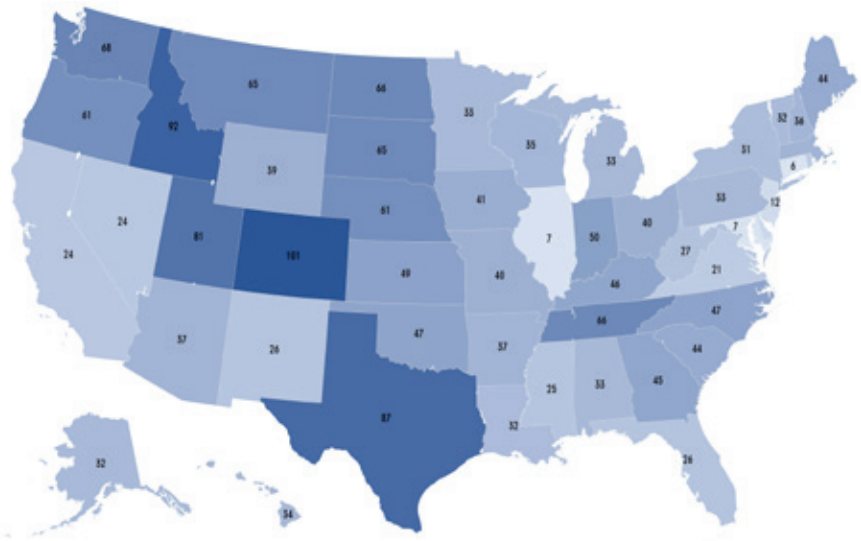


Through Q3 2021, the FHFA All-Transactions Index increased 16% year-over-year at the national level. Home prices increased in all 50 states over the past year and also accelerated in all 50 states compared with the prior year. The fastest growth in home prices was in Idaho (32%), Utah (27%) and Arizona (26%). Meanwhile, the slowest growth occurred in North Dakota (8%), Louisiana (9%) and the District of Columbia (10%).

Sources: *FHFA All-Transactions HPI/Arch MI*

Housing and Mortgage Market Indicators

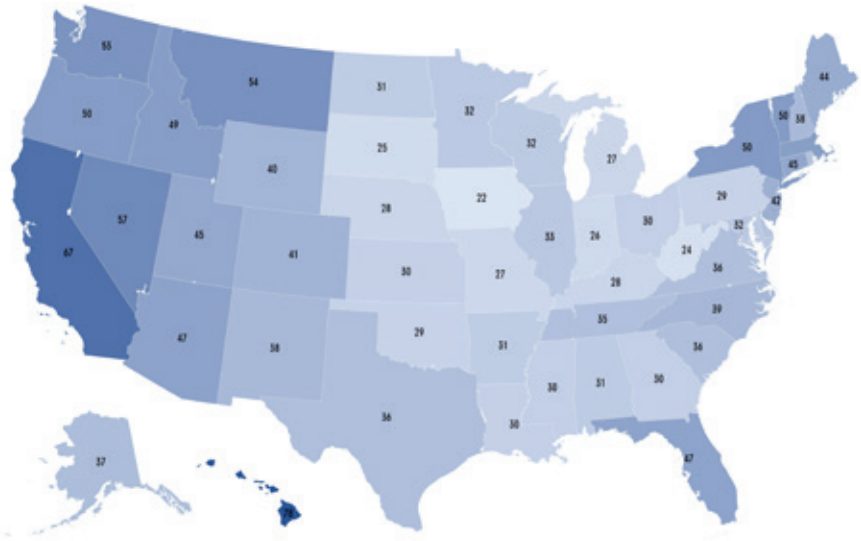
HOME-PRICE GROWTH SINCE PRIOR PEAK



Strong home-price appreciation over the past year resulted in home prices exceeding their prior peaks in all 50 states in the second quarter of 2021. Nationally, home prices are 42% above their prior peak according to the FHFA All Transactions Index. Cumulative home-price growth has varied widely since prices last peaked around 2006 (we measure since the peak for each state, which varied around 2006/2007). The largest cumulative home-price growth since home prices peaked is in Colorado (101%), followed by Idaho (92%) and Texas (87%). This chart is intended to aid understanding of market strength since the prior downturn and doesn't indicate any overvaluation since it doesn't account for changes in income or reasonableness of prices at their prior peak. Growth rates are based on nominal (not inflation-adjusted) values.

Sources: *FHFA/Arch MI*

PERCENTAGE OF MEDIAN INCOME NEEDED FOR HOMEOWNERSHIP COSTS ON A MEDIAN-PRICED HOME

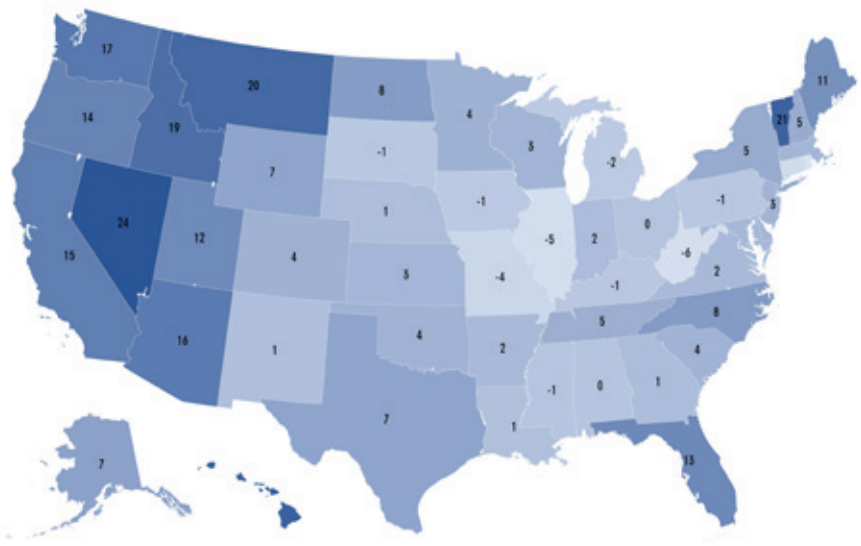


Our affordability measure is the percentage of median household income required to cover homeownership costs on a median-priced home. It includes mortgage payments, escrow expenses, maintenance costs, mortgage insurance and risk add-ons. Nationally, homeownership costs account for 40% of the U.S. median income as of Q3 2021, still well below the peak of 47% reached in Q4 2005. Calculations are based on pre-tax median household income, a 10% down payment, escrow of annual expenses of roughly 1.5% of the initial home price (for insurance and property taxes, which vary by state), the prevailing 30-year fixed-rate mortgage rate, plus 0.75% to cover mortgage insurance and risk add-ons, as well as roughly 1% of the initial home price to cover annual maintenance costs.

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

Housing and Mortgage Market Indicators

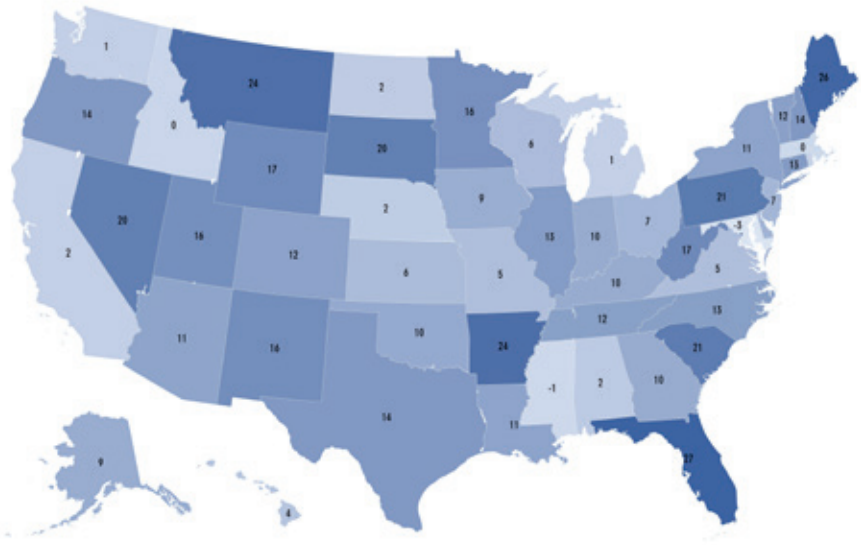
HOMEOWNERSHIP COST-TO-INCOME RATIO CHANGE VS. 1990–2003 AVERAGE



Affordability is now worse than historical norms in all states but 13, with the Northwest and Mountain West generally the least affordable along with Florida, Vermont and Hawaii. This map shows how affordability differs now compared to historical norms, represented as the percentage of median income needed to cover homeownership costs on a median-priced home (shown above) minus the average from the pre-bubble years between 1990 and 2003. For the U.S., the median-priced home requires 40% of the median income, up 3% from its 1990–2003 average of 37%. Nevada (24%) is now the least affordable state compared to its 1990–2003 average, followed by Hawaii (22%) and Vermont (21%).

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

ANNUAL PERCENTAGE CHANGE IN SINGLE-FAMILY HOUSING STARTS



Construction was started on a total of 1,122,800 single-family homes in the U.S. during 2021, up 13% from 2020. The annual growth in single-family housing starts varies widely across the U.S. but is generally weakest in the Northeast and strongest in the West, Midwest and parts of the Southeast. As of December 2021, single-family housing starts increased the most in the District of Columbia (155%), Florida (27%) and Maine (26%). To get a clearer understanding of the trend, unlike numbers seen elsewhere, we smooth the data by calculating the year-over-year growth in the 12-month moving average to dampen short-term volatility due to weather, survey limitations, etc.

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

State Housing and Demographic Trends

STATE (Sorted Alphabetically)	FHFA HPI (% Y/Y)		HOMEOWNERSHIP COST-TO-INCOME RATIO (%)		UNEMPLOYMENT RATE (%)			POPULATION (000s)		MEDIAN HOUSEHOLD INCOME	
	2021Q3	YEAR AGO	2021Q3	VS 1990-2003 AVG	DEC '21	COVID PEAK	PRE-COVID (FEB '20)	2021Q3	% Y/Y	2021Q3	% Y/Y
Alabama	14.8	5.9	31	0	3.1	13.2	2.6	4,934	0.2	$ 50,964	1.5
Alaska	10.6	3.2	37	7	5.7	11.8	5.1	741	1.2	$ 72,400	1.3
Arizona	26.2	8.1	47	16	4.1	14.2	4.9	7,640	2.4	$ 58,898	0.8
Arkansas	15.0	4.0	31	2	3.1	10.0	3.8	3,050	0.5	$ 44,741	-0.8
California	16.7	3.9	67	15	6.5	16.0	4.3	39,821	1.0	$ 81,548	2.0
Colorado	18.9	4.7	41	4	4.8	12.1	2.8	5,867	0.8	$ 94,658	5.6
Connecticut	16.9	4.2	45	-5	5.8	11.4	3.7	3,560	0.1	$ 69,550	-1.4
Delaware	14.4	4.9	34	3	5.0	13.4	4.5	994	0.5	$ 65,732	1.2
District of Columbia	9.7	3.0	52	12	5.8	11.1	5.0	702	-1.3	$ 94,421	8.2
Florida	20.8	6.0	47	13	4.4	14.2	3.3	22,266	2.0	$ 59,417	1.4
Georgia	17.5	5.7	30	1	2.6	12.5	3.5	10,848	1.1	$ 67,423	2.9
Hawaii	12.0	1.0	78	22	5.7	21.9	2.1	1,412	0.4	$ 76,049	0.0
Idaho	32.0	10.6	49	19	2.4	11.6	2.6	1,854	1.1	$ 63,473	2.9
Illinois	10.6	2.5	33	-5	5.3	16.5	3.6	12,604	0.2	$ 70,433	1.8
Indiana	16.1	5.6	26	2	2.7	16.9	3.2	6,773	0.2	$ 58,847	2.3
Iowa	12.0	2.9	22	-1	3.5	11.1	2.9	3,155	-0.2	$ 66,665	3.2
Kansas	14.8	5.0	30	3	3.3	12.6	3.2	2,919	0.1	$ 63,023	2.0
Kentucky	14.0	4.8	28	-1	3.9	16.9	4.2	4,490	0.2	$ 54,578	2.0
Louisiana	8.7	3.6	30	1	4.8	13.1	5.2	4,651	0.1	$ 50,736	0.2
Maine	21.1	6.3	44	11	4.7	9.1	3.1	1,351	0.1	$ 56,523	0.6
Maryland	13.3	3.7	32	3	5.0	9.0	3.5	6,114	0.8	$ 88,224	2.4
Massachusetts	15.4	4.8	49	3	3.9	16.4	2.8	6,909	0.2	$ 87,645	2.5
Michigan	15.6	5.0	27	-2	5.6	23.6	3.7	9,968	0.0	$ 60,677	1.3
Minnesota	14.2	4.5	32	4	3.1	11.3	3.3	5,704	0.7	$ 72,580	1.2
Mississippi	12.6	3.5	30	-1	4.5	15.7	5.8	2,970	0.1	$ 47,228	1.8
Missouri	15.2	5.1	27	-4	3.3	12.5	3.6	6,175	0.3	$ 60,383	2.3
Montana	23.2	5.9	54	20	2.5	11.9	3.7	1,084	0.2	$ 53,819	0.9
Nebraska	15.2	4.0	28	1	1.7	7.4	3.0	1,939	0.0	$ 63,559	2.2
Nevada	21.3	4.7	57	24	6.4	29.5	3.7	3,228	2.3	$ 51,210	-4.5
New Hampshire	19.0	6.4	38	5	2.6	16.0	2.6	1,379	0.8	$ 82,196	3.2
New Jersey	14.8	4.3	42	3	6.3	16.6	3.7	8,917	0.3	$ 84,780	1.1
New Mexico	15.5	5.6	38	1	5.8	12.5	5.3	2,112	0.2	$ 49,872	0.4
New York	13.9	4.5	50	5	6.2	16.2	3.9	19,315	0.0	$ 68,047	-0.7
North Carolina	18.2	5.6	39	8	3.7	13.5	3.6	10,770	1.3	$ 57,305	1.2
North Dakota	7.8	2.3	31	8	3.1	8.7	2.3	762	-0.4	$ 57,277	-1.1
Ohio	15.1	5.8	30	0	4.5	16.4	4.7	11,675	-0.1	$ 54,383	0.2
Oklahoma	14.0	4.3	29	4	2.3	13.0	3.1	3,998	0.3	$ 46,120	-2.6
Oregon	20.2	5.0	50	14	4.1	13.2	3.5	4,303	1.2	$ 71,528	2.5
Pennsylvania	14.0	5.0	29	-1	5.4	16.2	5.0	12,780	0.0	$ 64,817	1.7
Rhode Island	19.1	5.5	35	-7	4.8	17.4	4.0	1,058	0.1	$ 88,510	5.9
South Carolina	16.1	5.0	36	4	3.5	11.5	2.8	5,259	0.6	$ 55,074	1.2
South Dakota	16.8	4.5	25	-1	2.6	9.2	2.9	892	-0.1	$ 68,728	5.2
Tennessee	18.9	6.2	35	5	3.8	15.8	3.9	6,952	0.8	$ 54,043	0.1
Texas	17.6	4.1	36	7	5.0	12.9	3.7	29,880	1.4	$ 66,193	1.8
Utah	27.0	7.2	45	12	1.9	10.1	2.5	3,307	1.4	$ 77,232	2.6
Vermont	17.7	4.4	50	21	2.5	14.8	2.5	626	0.4	$ 55,842	-0.8
Virginia	13.6	4.7	36	2	3.2	11.3	2.5	8,690	1.0	$ 79,443	2.6
Washington	20.2	6.8	53	17	4.5	16.3	4.1	7,823	1.4	$ 77,803	0.2
West Virginia	11.4	4.6	24	-6	3.7	15.6	5.1	1,776	-0.4	$ 47,381	0.6
Wisconsin	14.4	4.2	32	3	2.8	14.8	3.3	5,851	0.3	$ 65,210	1.8
Wyoming	14.4	4.4	40	7	3.3	8.5	4.8	582	-0.1	$ 65,409	0.5
Population Weighted Total	16.5	4.8	41	6	4.6	14.7	3.8	332,429	0.7	$ 67,417	1.5

Housing and Demographic Trends for the 100 Largest MSAs

100 LARGEST METROPOLITAN	FHFA HPI (% Y/Y)		HOMEOWNERSHIP COST-TO-INCOME RATIO (%)		UNEMPLOYMENT RATE (%)			POPULATION (000s)		MEDIAN HOUSEHOLD INCOME	
	2021Q3	YEAR AGO	2021Q3	VS 1990-2003 AVG	DEC '21	COVID PEAK	PRE-COVID (FEB '20)	2021Q3	% Y/Y	2021Q3	% Y/Y
New York-Jersey City-White Plains, NY-NJ	10.8	3.2	56	4	7.7	18.1	3.6	14,181	0.0	$ 72,956	-0.1
Los Angeles-Long Beach-Glendale, CA	15.1	4.2	76	19	8.4	18.8	5.0	10,244	0.9	$ 73,629	1.7
Houston-The Woodlands-Sugar Land, TX	11.7	3.9	34	7	5.6	14.2	3.8	7,292	1.4	$ 73,001	3.9
Chicago-Naperville-Evanston, IL	10.3	2.4	36	-4	5.8	16.4	3.5	7,138	0.1	$ 76,604	1.7
Atlanta-Sandy Springs-Alpharetta, GA	18.1	5.5	30	4	2.6	12.9	3.3	6,161	1.0	$ 77,383	2.0
Dallas-Plano-Irving, TX	18.6	3.4	39	8	4.4	12.6	3.3	5,245	1.4	$ 77,076	3.1
Phoenix-Mesa-Chandler, AZ	27.1	8.5	46	16	3.7	13.5	4.3	5,213	2.3	$ 65,442	2.4
Washington-Arlington-Alexandria, DC-VA-MD-WV	12.4	4.4	36	4	3.9	10.1	2.9	5,022	0.6	$ 109,644	4.6
Riverside-San Bernardino-Ontario, CA	21.9	5.1	54	15	6.5	15.3	4.2	4,746	0.9	$ 70,644	0.2
Minneapolis-St. Paul-Bloomington, MN-WI	14.1	4.6	33	5	3.1	11.8	3.0	3,709	0.6	$ 82,244	2.0
San Diego-Chula Vista-Carlsbad, CA	17.9	4.8	71	14	5.5	16.0	3.4	3,407	0.9	$ 84,762	1.5
Tampa-St. Petersburg-Clearwater, FL	22.3	7.2	43	14	4.2	14.0	3.4	3,336	1.9	$ 56,961	-0.6
Anaheim-Santa Ana-Irvine, CA	12.9	3.5	80	26	5.0	14.9	3.1	3,241	0.9	$ 96,843	1.5
Seattle-Bellevue-Kent, WA	18.1	5.4	56	15	4.1	16.6	2.6	3,167	1.3	$ 99,203	0.8
Denver-Aurora-Lakewood, CO	18.6	4.6	40	7	4.8	12.3	2.6	3,022	0.8	$ 106,844	7.3
Oakland-Berkeley-Livermore, CA	14.0	2.4	69	5	5.4	14.9	3.2	2,883	0.9	$ 109,585	2.2
Baltimore-Columbia-Towson, MD	12.4	3.5	31	5	4.9	9.2	3.5	2,849	0.7	$ 84,787	2.6
Miami-Miami Beach-Kendall, FL	17.8	5.0	70	29	4.3	14.9	2.0	2,837	1.9	$ 54,618	0.0
Nassau County-Suffolk County, NY	13.2	4.5	50	14	3.8	17.5	3.6	2,828	-0.1	$ 104,948	-1.2
St. Louis, MO-IL	12.6	4.4	25	-3	3.7	13.2	3.4	2,819	0.2	$ 70,171	3.3
Orlando-Kissimmee-Sanford, FL	17.6	5.3	44	14	4.7	22.5	3.3	2,723	1.9	$ 60,898	-0.5
Charlotte-Concord-Gastonia, NC-SC	19.3	6.1	39	14	3.7	13.7	3.3	2,682	1.2	$ 66,485	1.7
San Antonio-New Braunfels, TX	16.8	3.8	37	9	4.3	13.2	3.3	2,633	1.4	$ 64,299	1.5
Warren-Troy-Farmington Hills, MI	14.6	4.6	28	-2	4.5	23.7	3.8	2,571	0.0	$ 76,210	3.0
Fort Worth-Arlington-Grapevine, TX	19.2	3.9	33	6	4.2	12.9	3.3	2,571	1.4	$ 73,407	2.4
Portland-Vancouver-Hillsboro, OR-WA	18.5	4.6	48	13	4.1	13.1	3.5	2,559	1.2	$ 84,323	4.3
Newark, NJ-PA	13.2	4.0	52	4	6.4	15.5	3.8	2,514	0.3	$ 84,097	2.6
Sacramento-Roseville-Folsom, CA	20.5	4.6	48	10	5.6	14.4	3.7	2,412	0.9	$ 77,026	1.0
Cambridge-Newton-Framingham, MA	13.9	4.4	50	1	3.5	14.7	2.5	2,411	0.2	$ 101,195	3.0
Las Vegas-Henderson-Paradise, NV	20.2	4.8	57	24	7.3	33.2	4.0	2,385	2.2	$ 50,043	-5.0
Pittsburgh, PA	13.4	5.3	23	-2	5.4	16.8	5.0	2,317	0.0	$ 65,045	3.4
Austin-Round Rock-Georgetown, TX	32.7	6.2	47	15	3.7	12.1	2.9	2,299	1.4	$ 84,565	2.8
Cincinnati, OH-KY-IN	14.9	5.7	29	-1	4.0	13.5	4.1	2,197	0.0	$ 64,982	2.6
Kansas City, MO-KS	15.6	6.3	29	1	3.4	13.5	3.3	2,170	0.2	$ 73,637	3.5
Philadelphia, PA	13.3	5.7	31	3	6.9	17.4	5.6	2,150	0.0	$ 55,819	4.5
Columbus, OH	16.2	6.3	36	3	4.1	12.9	4.1	2,117	-0.1	$ 63,275	1.7
Indianapolis-Carmel-Anderson, IN	16.4	6.5	30	4	2.6	13.2	2.9	2,085	0.2	$ 64,780	3.7
Cleveland-Elyria, OH	14.6	6.2	31	-2	4.7	21.4	4.8	2,043	-0.1	$ 53,812	1.5
Boston, MA	14.9	4.6	49	3	3.9	16.5	2.6	2,040	0.2	$ 94,968	3.6
Fort Lauderdale-Pompano Beach-Sunrise, FL	18.4	4.8	55	19	4.6	17.2	3.8	2,039	1.9	$ 60,645	-0.3
San Jose-Sunnyvale-Santa Clara, CA	6.5	-0.6	91	25	4.2	12.3	2.9	2,031	0.9	$ 130,915	0.6
Nashville-Davidson--Murfreesboro--Franklin, TN	19.0	5.8	36	7	3.2	15.9	3.1	1,993	0.8	$ 68,994	1.9
Montgomery County-Bucks County-Chester County, PA	14.3	4.7	32	-3	4.5	13.8	4.0	1,984	0.0	$ 99,774	4.6
Virginia Beach-Norfolk-Newport News, VA-NC	14.0	4.6	28	-1	3.6	12.6	2.7	1,780	0.9	$ 73,185	4.3
Detroit-Dearborn-Livonia, MI	15.1	5.2	24	-3	6.3	27.0	5.1	1,750	0.0	$ 52,234	2.4
San Francisco-San Mateo-Redwood City, CA	2.1	-4.0	99	19	4.2	12.5	2.4	1,682	0.9	$ 134,687	4.0
Providence-Warwick, RI-MA	18.2	5.5	37	-5	4.8	18.6	3.8	1,629	0.1	$ 84,314	6.7
Jacksonville, FL	21.2	6.3	38	9	4.1	11.7	3.3	1,628	1.9	$ 65,015	-0.2
Milwaukee-Waukesha, WI	13.6	4.3	38	3	3.2	15.2	3.5	1,584	0.2	$ 68,919	4.9
West Palm Beach-Boca Raton-Boynton Beach, FL	19.6	6.2	52	16	4.3	14.7	3.7	1,563	1.9	$ 67,590	2.5

Housing and Demographic Trends for the 100 Largest MSAs

100 LARGEST METROPOLITAN	FHFA HPI (% Y/Y)		HOMEOWNERSHIP COST-TO-INCOME RATIO (%)		UNEMPLOYMENT RATE (%)			POPULATION (000s)		MEDIAN HOUSEHOLD INCOME	
	2021Q3	YEAR AGO	2021Q3	VS 1990-2003 AVG	DEC '21	COVID PEAK	PRE-COVID (FEB '20)	2021Q3	% Y/Y	2021Q3	% Y/Y
Raleigh-Cary, NC	19.2	5.0	36	9	3.1	12.0	3.1	1,431	1.3	$ 80,906	2.3
Oklahoma City, OK	13.2	4.7	27	4	2.2	13.5	2.9	1,420	0.4	$ 52,280	-0.8
Memphis, TN-MS-AR	16.4	6.5	34	3	4.8	13.3	4.7	1,373	0.6	$ 53,860	1.0
Frederick-Gaithersburg-Rockville, MD	13.0	2.9	37	1	4.6	8.3	3.1	1,333	0.7	$ 112,059	3.5
Richmond, VA	15.4	4.7	34	6	3.7	11.7	2.6	1,319	0.9	$ 72,637	4.8
Louisville/Jefferson County, KY-IN	14.1	4.7	27	0	3.6	16.9	3.5	1,304	0.2	$ 64,304	3.2
New Orleans-Metairie, LA	11.2	4.6	34	4	5.4	17.0	4.9	1,273	0.1	$ 56,437	2.2
Salt Lake City, UT	25.7	7.2	42	14	1.9	10.9	2.4	1,272	1.4	$ 85,197	7.0
Camden, NJ	18.3	5.3	32	-1	6.0	16.0	3.8	1,252	0.3	$ 80,811	0.4
Hartford-East Hartford-Middletown, CT	15.0	4.1	37	-1	5.8	11.0	3.7	1,207	0.0	$ 68,506	-0.6
Birmingham-Hoover, AL	13.3	5.8	32	-1	2.9	11.8	2.4	1,159	0.2	$ 57,910	2.3
Buffalo-Cheektowaga, NY	17.9	5.8	33	4	4.4	20.7	4.4	1,126	-0.1	$ 56,185	-1.7
Tucson, AZ	22.4	7.6	46	12	4.0	13.9	4.7	1,103	2.3	$ 53,952	2.0
Grand Rapids-Kentwood, MI	18.1	5.7	30	5	5.0	21.0	2.7	1,075	0.0	$ 68,116	3.0
Rochester, NY	16.5	6.1	30	2	3.9	15.8	4.3	1,067	-0.1	$ 58,233	-1.4
Fresno, CA	19.2	5.1	46	10	8.3	16.6	7.3	1,020	0.9	$ 57,813	1.1
Tulsa, OK	14.9	4.6	33	7	2.4	13.7	3.1	1,006	0.4	$ 50,329	0.0
Urban Honolulu, HI	9.5	-0.3	86	18	5.3	19.4	2.0	980	0.2	$ 81,207	1.5
Worcester, MA-CT	18.0	5.6	38	-1	4.3	15.0	3.1	951	0.2	$ 76,556	1.7
Omaha-Council Bluffs, NE-IA	14.9	4.9	28	1	2.0	8.8	3.1	950	0.0	$ 71,325	2.3
Bridgeport-Stamford-Norwalk, CT	16.6	3.5	54	-10	5.6	11.6	3.7	945	0.0	$ 88,105	1.4
Greenville-Anderson, SC	15.4	4.9	34	2	3.2	11.8	2.5	934	0.6	$ 57,547	1.4
Tacoma-Lakewood, WA	21.7	9.0	48	16	5.1	18.1	5.4	932	1.3	$ 77,998	-0.3
Albuquerque, NM	17.2	5.8	38	3	5.6	12.2	4.9	923	0.2	$ 56,132	0.3
Bakersfield, CA	19.4	5.5	45	14	8.9	18.1	8.1	919	0.9	$ 53,517	1.4
Knoxville, TN	20.7	6.7	36	5	3.5	14.1	3.7	908	0.8	$ 54,811	0.5
McAllen-Edinburg-Mission, TX	12.5	4.1	23	-4	8.2	17.8	6.8	896	1.4	$ 42,350	-0.2
Albany-Schenectady-Troy, NY	14.7	4.0	31	-2	3.8	13.5	3.7	879	-0.1	$ 69,129	-1.0
North Port-Sarasota-Bradenton, FL	23.7	5.2	47	14	4.0	14.8	3.3	874	1.9	$ 65,300	0.8
El Paso, TX	13.2	5.1	35	3	5.6	14.4	3.6	871	1.4	$ 50,125	1.1
Lake County-Kenosha County, IL-WI	10.5	1.9	29	-8	4.2	15.7	3.4	869	0.1	$ 86,923	2.2
Oxnard-Thousand Oaks-Ventura, CA	15.7	3.2	63	12	5.3	14.7	3.8	863	0.9	$ 93,559	2.0
New Haven-Milford, CT	18.2	4.5	41	0	6.0	11.3	4.0	856	0.0	$ 61,660	-1.3
Columbia, SC	15.2	4.7	30	2	3.3	9.0	2.7	851	0.6	$ 54,890	1.6
Allentown-Bethlehem-Easton, PA-NJ	16.5	5.6	30	-3	5.6	17.0	4.8	845	0.0	$ 72,825	2.9
Baton Rouge, LA	8.6	2.7	30	2	4.3	12.1	4.8	835	0.1	$ 58,691	-2.6
Charleston-North Charleston, SC	17.8	5.1	37	5	3.2	11.6	2.3	814	0.7	$ 69,333	1.6
Dayton-Kettering, OH	15.1	6.1	27	0	4.5	15.5	4.5	806	-0.1	$ 53,913	1.1
Cape Coral-Fort Myers, FL	25.6	5.3	44	17	4.2	15.2	3.5	805	2.0	$ 61,593	0.1
Greensboro-High Point, NC	16.6	5.3	33	0	4.2	15.6	3.9	794	1.3	$ 51,674	1.0
Stockton, CA	23.9	4.5	53	15	7.6	17.5	6.0	778	0.9	$ 69,119	0.8
Boise City, ID	34.8	11.5	48	20	2.4	12.2	2.5	770	1.2	$ 69,904	4.0
Elgin, IL	13.3	2.5	27	-7	4.8	16.9	3.7	768	0.1	$ 85,387	1.2
Colorado Springs, CO	22.2	6.9	34	2	5.2	12.6	3.2	760	0.8	$ 89,338	5.8
Lakeland-Winter Haven, FL	21.6	7.1	40	13	5.1	18.4	4.2	757	2.0	$ 50,993	-0.6
Little Rock-North Little Rock-Conway, AR	12.3	3.7	25	0	3.2	10.6	3.6	751	0.5	$ 52,016	-0.7
Wilmington, DE-MD-NJ	14.0	4.8	35	3	5.2	12.3	4.4	733	0.5	$ 73,057	3.3
Gary, IN	16.3	4.6	26	1	3.4	19.7	4.6	707	0.2	$ 63,597	2.2
Akron, OH	14.7	5.5	26	-2	4.6	14.7	4.7	702	-0.1	$ 53,892	1.7
Des Moines-West Des Moines, IA	12.5	2.5	27	1	3.4	12.1	2.8	659	-0.2	$ 76,702	2.9

Cautionary Note Regarding Forward-Looking Statements

The Private Securities Litigation Reform Act of 1995 provides a "safe harbor" for forward-looking statements. This release or any other written or oral statements made by or on behalf of Arch Capital Group Ltd. and its subsidiaries may include forward-looking statements, which reflect our current views with respect to future events and financial performance. All statements other than statements of historical fact included in or incorporated by reference in this release are forward-looking statements.

Forward-looking statements can generally be identified by the use of forward-looking terminology such as "may," "will," "expect," "intend," "estimate," "anticipate," "believe" or "continue" or their negative or variations or similar terminology. Forward-looking statements involve our current assessment of risks and uncertainties. Actual events and results may differ materially from those expressed or implied in these statements. A non-exclusive list of the important factors that could cause actual results to differ materially from those in such forward-looking statements includes the following: adverse general economic and market conditions; increased competition; pricing and policy term trends; fluctuations in the actions of rating agencies and the Company's ability to maintain and improve its ratings; investment performance; the loss of key personnel; the adequacy of the Company's loss reserves, severity and/or frequency of losses, greater than expected loss ratios and adverse development on claim and/or claim expense liabilities; greater frequency or severity of unpredictable natural and man-made catastrophic events, including pandemics such as COVID-19; the impact of acts of terrorism and acts of war; changes in regulations and/or tax laws in the United States or elsewhere; the Company's ability to successfully integrate, establish and maintain operating procedures as well as consummate acquisitions and integrate the businesses the Company has acquired or may acquire into the existing operations; changes in accounting principles or policies; material differences between actual and expected assessments for guaranty funds and mandatory pooling arrangements; availability and cost to the Company of reinsurance to manage the Company's gross and net exposures; the failure of others to meet their obligations to the Company; changes in the method for determining the London Inter-bank Offered Rate ("LIBOR") and the potential replacement of LIBOR and other factors identified in the Company's filings with the U.S. Securities and Exchange Commission ("SEC").

The foregoing review of important factors should not be construed as exhaustive and should be read in conjunction with other cautionary statements that are included herein or elsewhere. All subsequent written and oral forward-looking statements attributable to us or persons acting on our behalf are expressly qualified in their entirety by these cautionary statements. The Company undertakes no obligation to publicly update or revise any forward-looking statement, whether as a result of new information, future events or otherwise.

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