



Pandemic Homebuyers: Who Were They, and Where Did They Buy?

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Disclaimer

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Executive Summary

Stable and affordable housing is foundational for participating in the economy, and homeownership is the primary form of wealth accumulation for most American families. Housing demand changed as households responded to the economic and social environment of the COVID-19 pandemic. As households moved because of these changing conditions and homebuying surged, many popular narratives emerged around migration patterns, “hot” places to buy, and what types of buyers were succeeding in the market.


This research brief employs mortgage data from the Home Mortgage Disclosure Act (HMDA) to examine the homebuying patterns of households during this unique housing market, focusing on two key dimensions:

- 1) Who bought homes (i.e., homebuying trends by buyers’ race/ethnicity, income, and age)?
- 2) Where were these homes located (i.e., homebuying trends across urban, suburban, small metro, and nonmetropolitan locations)?

The few years of the pandemic and immediate post-pandemic were an unusual moment in the homebuying market. However, patterns during this time could have long-term implications on disparities in homeownership by race/ethnicity, income, and age (and related gaps in asset accumulation and wealth), as well as geographic differences that affect regional housing and labor markets and household budgets.

Key Findings

- The pandemic period ushered in a period of peak homebuying for historically marginalized groups of homebuyers. Buyers of color, low- and moderate-income buyers, and younger buyers all participated in the homebuying market at elevated rates.
- Homebuying in urban areas experienced a modest decline in 2020 relative to other types of locations but rebounded in 2021. At the same time, the pandemic period continued pre-pandemic growth in smaller metropolitan and nonmetropolitan areas.

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- Declines in the number of loans originated from 2021 to 2022 suggest that changing market conditions (high prices and interest rates) may have reduced affordability and made it challenging for new homebuyers to enter the market or for existing homeowners to make changes to their housing situations.

Although gains were made from 2018 to 2022 for homebuyers from historically marginalized groups, if tightened conditions related to high prices and interest rates persist, they could stall or potentially reverse pandemic-era gains. Additionally, regional variations in access by marginalized groups may point to additional advantages or constraints in local markets. As market conditions continue to evolve, it will be important to continue to monitor the trends highlighted in this paper.



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Introduction

Stable and affordable housing is foundational for participating in the economy, and homeownership is the primary form of wealth accumulation for most American families. The COVID-19 pandemic created a historically unusual housing market. Early in the pandemic, households faced uncertainty and financial instability as workers were laid off or furloughed and activities outside the home ground to a halt. These changes produced countervailing trends, with some households making changes to alleviate financial pressures while others sought out bigger or different types of housing units. Some households responded to the financial uncertainty and health risk by moving. There were those that doubled up with family members or chose more affordable units farther from workplaces, while others moved out of crowded living conditions (i.e., crowded households or densely populated neighborhoods). Office employees newly working from home and parents with children participating in remote schooling felt the need for more spaces to work and spend leisure time at home, increasing demand for larger housing units, private outdoor space, and home furnishings. Finally, the Federal Reserve's interest rate cut in March 2020 increased affordability in the homebuying market, while other federal and state responses to the pandemic economy (e.g., stimulus payments and expanded unemployment benefits) increased many households' feelings of financial security.

Headlines and popular narratives took hold about pandemic migration patterns—depopulation of urban cores, particularly from New York City and San Francisco; high-income remote workers fleeing for second-home or rustic-leisure destinations; exodus from expensive coastal states and metros to more moderately priced markets in the Mountain West and the South.¹ Headlines also focused on the fierce competition in the homebuying markets, with prices surging in 2021, dozens of offers on sight-unseen homes, and the struggle of many first-time buyers to gain a toehold in the market.²

How did shifting housing demand (both for types of housing and its location) and changing affordability dynamics affect who was participating in the homebuying market and where they were doing so? Did homebuying patterns by location mirror larger pandemic migration patterns? Did the lower monthly mortgage payments enabled by lower interest rates allow more types of buyers to participate in the market, or did rising prices and competitive bidding environments make it more challenging for historically marginalized buyers to participate?



To provide information that can begin to answer these types of questions, this research brief employs mortgage data from the Home Mortgage Disclosure Act (HMDA) to examine the homebuying patterns of households during this unique housing market, focusing on two key dimensions:

- 1) Who bought homes (i.e., homebuying trends by buyers' race/ethnicity, income, and age)?
- 2) Where were these homes located (i.e., homebuying trends across urban, suburban, small metro, and nonmetro locations)?

Though the few years of the pandemic and immediate post-pandemic were an unusual moment in the homebuying market, these patterns could have long-term implications for inequality, given the role homeownership plays in building wealth and the importance of location in access to local labor markets and educational opportunities. For instance, if existing disparities by income, age, and race/ethnicity were exacerbated at this moment of relative affordability, the gap between those who have historically struggled to become homeowners and those who have not could have widened and remain wide now that the homebuying environment is more challenging. At the same time, homeowners are less mobile than renters, and changing affordability conditions have made it less advantageous to sell, keeping many homeowners in place. Thus, any new geographic patterns established in the pandemic and post-pandemic period may hold for several years, which has implications for regional housing and labor markets, affecting price trends and households' willingness to move for job opportunities.

This paper begins by summarizing the literature on migration patterns during the pandemic and by setting the context of the pandemic housing market. It continues with a description of the data and methods used in this paper. The findings section begins with national trends and an examination of the types of borrowers who took out home-purchase loans, followed by a look at where home-purchase loan activity was concentrated, tracing geographic shifts, and comparing trends during the pandemic and post-pandemic period (defined as 2020–2022) with those in the years right before (defined as 2018–2019). The findings section concludes with a spotlight on states in the 12th Federal Reserve District to highlight regional variations to national trends. The paper ends with a discussion of the results and conclusions.



Background

Pandemic Migration Patterns


Economic and social responses to the pandemic—layoffs, availability of work-from-home, changes in consumption patterns—affected demand for housing, both for unit characteristics and locations. Fear of getting sick led many individuals to leave crowded housing conditions or densely populated areas. As workers and families found themselves working and schooling from home, many wanted housing units with more space. Additionally, the ability to work from home allowed households living in expensive areas to seek cheaper housing that was farther away from job centers. Survey data confirm these trends, finding that more families reported non-job-related reasons for moving (e.g., family and lifestyle) than prior to the pandemic, particularly for higher-income households.³ Studies also suggest that areas with greater numbers of jobs that could be done remotely saw greater departures of workers.⁴ However, job-related reasons for moving (e.g., relocation or job loss) or other financial reasons for moving were still prevalent reasons among lower-income movers.⁵

Shifts Away from Urban Cores

An emerging literature has tracked pandemic migration patterns and population shifts. It confirms much of the national narrative, showing increases in moves out of center-city cores for suburban or exurban areas⁶ and movement from larger metropolitan areas to smaller metros or rural areas.⁷ Many people moved to lower-cost areas.⁸ Several of these trends are particularly pronounced for higher-income households, who were more likely than lower-income households to leave higher-cost, larger cities for smaller, lower-cost ones or suburban areas.⁹

Similarly, papers tracking population shifts have shown growth in smaller metros and declines in larger ones.¹⁰ Nonmetropolitan areas saw substantially larger growth in 2020–2021 and 2021–2022 than they had in the previous decade.¹¹ Interestingly, the decline in population growth among larger metros was not just concentrated in the urban cores; many suburban areas in big metros also experienced slowdowns in growth (though they often still grew faster than their nearby central cities).¹²

Some of these trends, while heightened during the pandemic period, had started before it. After a boom in the early 2010s prompted much discussion of “back to the



cities,” growth in urban areas slowed and even declined in some places in the late 2010s.¹³ This was true not just of the urban cores of large metro areas but also of many large metropolitan areas themselves (including their suburbs).¹⁴ Although nonmetro areas had experienced mainly negative growth in the 2010s, that trend had begun to reverse in the late 2010s (with an exception from 2019 to 2020).¹⁵ One study, which tracked migration rather than population shifts during the pandemic, found that shifts from high-cost, large metros to lower-cost or smaller metros and rural areas was “a rapid acceleration of a trend emerging during the previous expansion.”¹⁶

Evidence of Returning to Pre-Pandemic Trends

It is unclear whether these pandemic trends in residential location are enduring. Early evidence suggests that some of these trends may have moderated or reversed over time. Population data from 2022 suggested that population decline in urban cores was much sharper in 2020–2021 than in 2021–2022, while exurban counties showed more muted growth in 2021–2022 (though still at 10-year highs).¹⁷ Rebounds in major urban areas were even stronger in 2022–2023; growth in nonmetro areas continued, while smaller metros moderated.¹⁸ Migration data tell a similar story: urban neighborhoods in many places are returning to pre-pandemic trends.¹⁹ Looking more broadly at large metro areas (rather than their urban cores) reveals similar trends. In aggregate, though the growth in the largest metro areas (those with populations above 1 million) was smaller than in other metro areas in 2021–2022 and 2022–2023, it reversed its negative trend from 2020 to 2021.²⁰

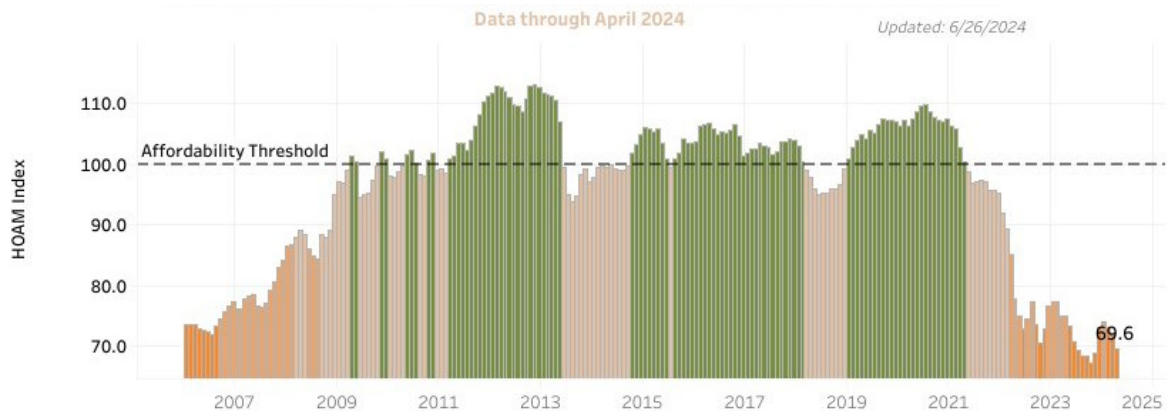


Pandemic Housing Market Context

These changing preferences for housing type and location interacted with interest rate conditions to create a unique moment in the homebuying market. According to data from the U.S. Federal Housing Finance Administration's All-Transaction House Price Index, nationally, home prices had been increasing at a roughly steady pace since the trough in home prices after the Great Recession in 2012. Price growth accelerated in the latter half of 2020 and surged in 2021 before flattening in the second half of 2022. Mortgage interest rates on 30-year fixed-rate loans (the other half of the home-purchase affordability calculation for the average homebuyer) had hovered between 3.5 and 5.0 percent in the 2010s.²¹ In March 2020, in response to the pandemic, the Federal Reserve cut the Federal Funds Rate, and the prevailing mortgage interest rate soon followed, dipping below 3.0 percent for much of the latter half of 2020 and 2021.²² In response to inflation, the Fed began a rate-hike cycle in March 2022; the prevailing mortgage interest rate surged to 7.0 percent by late 2022 and rose above 7.75 percent in late 2023.²³

Though prices were generally increasing throughout the study period (2018–2022), according to the Federal Reserve Bank of Atlanta's Home Ownership Affordability Monitor, changes in median incomes and interest rates were enough to offset rising prices nationally through the middle of 2021. This resulted in the highest national level of homeowner affordability since the aftermath of the Great Recession (Figure 1) (this was not true in all areas—in some places, price changes outpaced income and interest rate changes). Affordability nationally tapered off in the second half of 2021 as prices rose more quickly, and it then contracted sharply as rising interest rates, coupled with continued price growth, impacted affordability.²⁴ Demand in the homebuying market followed this affordability trend, with home sales²⁵ and home-purchase loans peaking in 2021 before dropping off in 2022.

Figure 1: Homebuyer Affordability Peaked during the Pandemic



Source: Federal Reserve Bank of Atlanta National Home Ownership Affordability Monitor (HOAM) Index. The tool uses “the HUD standard 30-percent share of income threshold to measure affordability” to estimate homeownership affordability for the median homeowner based on the “estimated annual costs associated with owning a median-priced home.”

Studies of the homebuying market during this time have tended to focus on housing demand and how migration patterns affected price dynamics in different types of locations (see, for example, Mondragon and Weiland²⁶ and Gamber et al.²⁷). Fewer studies have focused on the homebuyers themselves (see Klesta²⁸) and whether their purchase patterns mirror general pandemic migration trends. This paper begins to address these gaps.



Data and Methodology

The goals of this research are to understand the homebuying patterns of homeowners, both in their geographic distribution and to assess the extent to which homeowners who have historically faced more challenges in the homeownership market (buyers of color, lower-income buyers, younger buyers) were able to participate during this unique buying period. This analysis uses the following data and definitions to answer these research questions.

Data Source

This paper uses Home Mortgage Disclosure Act (HMDA) data from 2018 to 2022. It uses home-purchase loans for owner-occupied,²⁹ first-lien, site-built (vs. manufactured),³⁰ single-family (one- to four-unit) mortgages that are not used for business purposes. It also excludes reverse mortgages. Throughout the paper, “homebuying” is used as a shorthand for these loans.

Cash buyers and buyers using mortgages to finance second homes and investment properties were not included in these data. This likely means that the estimates of the share of purchases by people of color, lower-income people, and younger people are likely upper-bound estimates, since these groups typically have lower levels of wealth, making them less likely to be second-home buyers, investment buyers, or cash buyers. For more information about trends in investor and cash buyers, see the [Appendix](#).

Loans that had errors in their geographic data (e.g., a missing county or census tract) or that were not able to be linked to the data underlying the urban-suburban typology described in the following paragraph were excluded.³¹ The year 2018 was selected as the first year of data analysis to set a pre-pandemic baseline and to ensure consistency within the HMDA data, as substantial changes were made beginning in 2018.



Geographies


To look at geographic differences by urban/suburban and metro type, census tracts are classified following Kneebone and Berube.³² Within metropolitan statistical areas (MSAs) with a population of at least 500,000, urban areas are the first named principal city in the MSA name and any other principal city in the MSA name with at least 100,000 residents.³³ All other areas within these MSAs are suburban. MSAs that are too small to be classified as urban or suburban are considered small metros. Any area not within an MSA is classified as nonmetropolitan.³⁴ MSA definitions are as of March 2020 and, for the purposes of assignment of geographic type, are consistent within the sample.³⁵

Race, Ethnicity, Income, and Age

Borrower race/ethnicity is determined by the race/ethnicity of the primary borrower and is the first reported race.³⁶ Hispanics may be of any race; all other groups are non-Hispanic. Low- and moderate-income (LMI) borrowers are those making less than 80 percent of area median income (AMI), as defined by the Federal Financial Institutions Examination Council and attached to the HMDA data. Middle-income buyers are those making 80–120 percent of AMI, and high-income buyers are those making 120 percent of AMI or more. If data are missing for race/ethnicity, those observations are excluded from the reported results for race/ethnicity but not from other results; the same is true for missing income and age data.

Volumes and Shares

In the following sections, results are presented using both **shares**—the proportion of all loans originated going to particular groups—as well as the total **number** of loans going to each group. Shares offer insights into the demographic makeup of mortgage borrowers in a given year and how that distribution shifts over time. However, total loan volumes fluctuate from year to year, which means the proportion of loans going to a particular group and the total number of loans issued to that group may not always trend together. For instance, a marked increase in lending activity in a given year may mean the number of loans going to a particular demographic group (e.g., LMI homebuyers) increases; however, if loan volumes increase even more for another demographic group (e.g., higher-income borrowers), then the share of loans going to



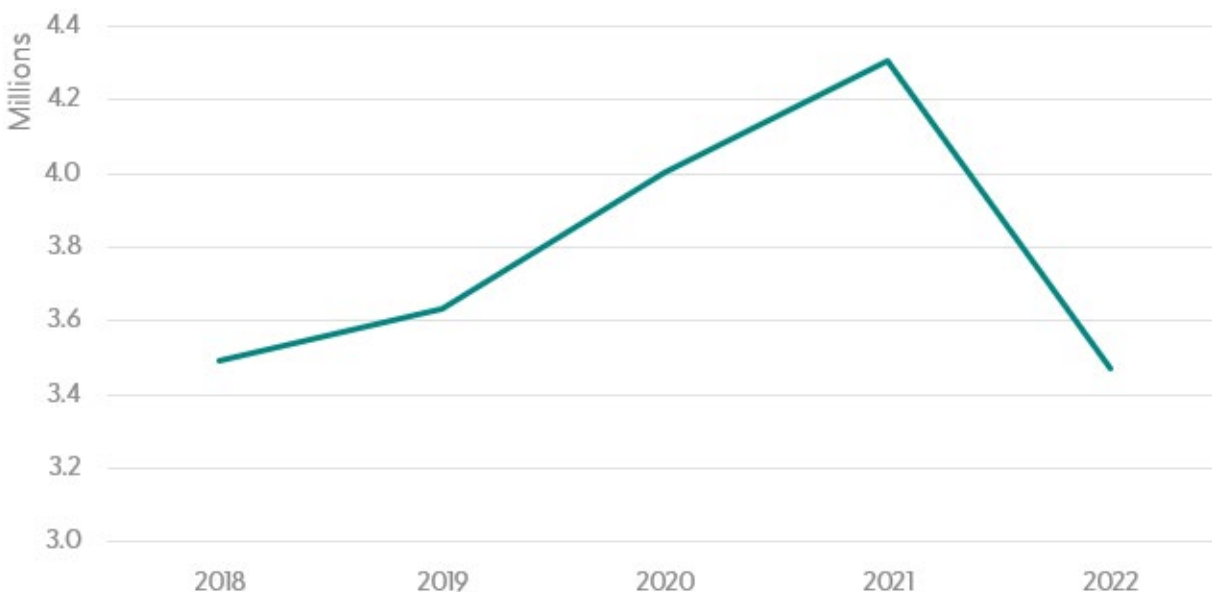
the first group (LMI homebuyers) could decline. Thus, although these trends are related, the differences between them can help illuminate distinct patterns.

Findings

The pandemic homebuying market had aspects that were both potentially beneficial and detrimental to first-time homebuyers and those who have historically struggled to enter homeownership. As noted previously, low interest rates created the highest levels of homebuying affordability seen in recent years in many parts of the country, and vigorous stock performance in the early years of the pandemic could have bolstered the down-payment funds of those who were saving via the stock market. However, surging demand and changing preferences also resulted in marked home-price appreciation. This appreciation, coupled with the rapid rise of interest rates in 2022, resulted in a sharp contraction of affordability. These dynamics are reflected in the national trends in home mortgage loans over this period.

Home-purchase mortgage loans increased from 3.5 million in 2018 to 4.0 million in 2020, peaking at 4.3 million in 2021 (Figure 2). Purchase loans shrank 19.3 percent from 2021 to 2022. The homeownership rate increased during this period, rising from 64.4 percent in 2018 to 65.8 percent in 2022, according to Housing Vacancy Survey data.³⁷

Figure 2: Home-Purchase Mortgage Loans Surged during the Pandemic before Experiencing a Steep Decline



Source: Author's calculations of HMDA data.

Who Bought Homes?

More Borrowers of Color Bought Homes During and After the Pandemic Than Before It

The pandemic and post-pandemic period resulted in more loans to borrowers of color (Table 1). The number of loans made to borrowers of all racial/ethnic groups grew in 2020 and 2021. Despite the declines in loan volumes from 2021 to 2022, more loans were made to borrowers of most racial/ethnic groups in 2022 than in 2018 (except for White and Native Hawaiian and Pacific Islander borrowers).

The share of loans made to Black, Hispanic, and Asian borrowers increased throughout this period, with notable increases between 2020 and 2021 (Figure 3). The share of loans going to Black borrowers increased from 7.7 percent in 2018 to 9.3 percent in 2022; the shares increased from 12.2 percent to 14.4 percent for Hispanic borrowers and from 7.0 percent to 9.1 percent for Asian borrowers. The shares for American Indians/Alaska Natives and for Native Hawaiians and Pacific Islanders

remained flat throughout the five-year period. The growth in the number of borrowers of color is reflected in growing homeownership rates: the Black homeownership rate grew from 42.9 percent in 2018 to 45.9 percent in 2022, while the Hispanic homeownership rate grew from 47.1 percent to 48.7 percent (comparable numbers are not available for Asian, American Indian/Alaska Native, or Native Hawaiian and Pacific Islander households).³⁸

Table 1: Despite Declines in the Number of Loans from 2021, More People of Color Purchased in 2022 Than in 2018

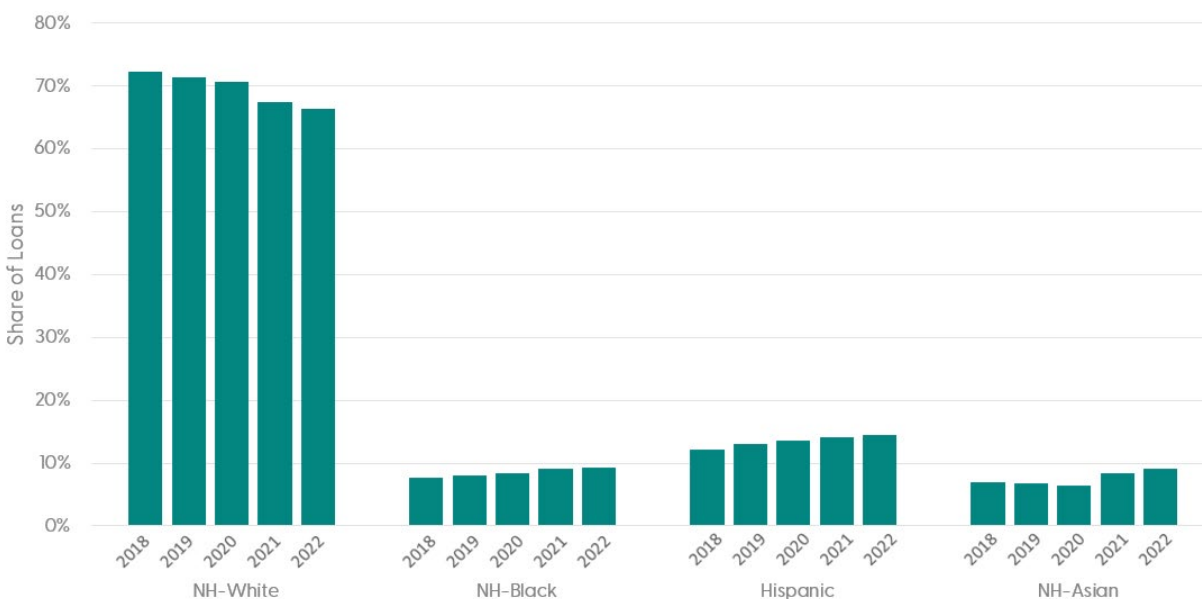
	2018	2019	2020	2021	2022	2018– Peak (% Ch)	2018– 2022 (% Ch)
AI/AN	17,886	19,048	22,782	25,514	21,187	42.6%	18.5%
Asian	219,585	216,755	232,471	320,029	276,617	45.7%	26.0%
Black	243,441	261,391	300,086	344,055	284,631	41.3%	16.9%
NHPI	7,423	6,888	7,745	8,068	6,102	8.7%	-17.8%
White	2,279,499	2,314,620	2,522,630	2,560,064	2,020,330	12.3%	-11.4%
Hispanic	384,684	423,161	485,395	539,373	439,990	40.2%	14.4%

Note: Hispanics may be of any race; all other groups are non-Hispanic.

Abbreviations: AI/AN = American Indian/Alaska Native; NHPI = Native Hawaiian or Pacific Islander.

Source: Author’s calculations of HMDA data.

Figure 3: The Share of Loans Made to People of Color Grew from 2018 to 2022



Note on abbreviations: NH = Non-Hispanic

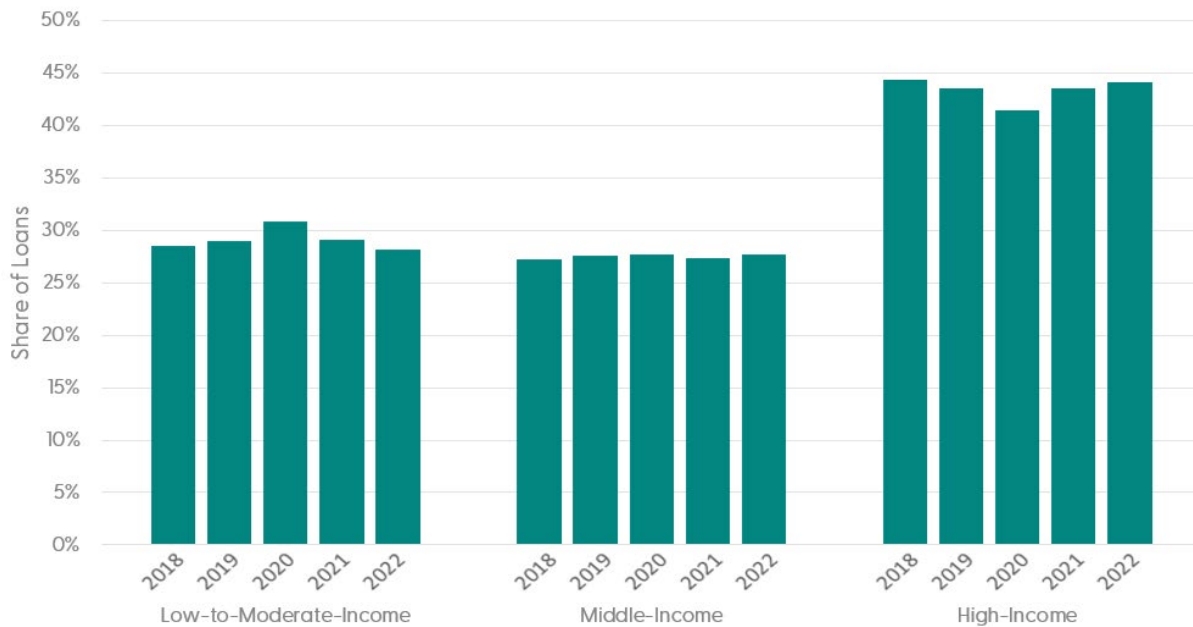
Source: Author's calculations of HMDA data.

LMI Buying Peaked During Pandemic Before Receding to Pre-Pandemic Level

Homebuying for low- and moderate-income (LMI) households increased during the pandemic period but has receded to a bit below pre-pandemic levels.³⁹ The LMI share of purchase loans peaked at 30.8 percent in 2020 (Figure 4). By 2022, both the number (Table 2) and share of loans going to LMI borrowers had fallen slightly below 2018 levels.

These trends were roughly consistent across racial/ethnic groups. For all racial/ethnic groups, the share of loans going to low-income borrowers peaked in 2020 before declining in 2021 and 2022. Relative to 2020, the declines in shares were larger for non-White groups. However, in absolute terms, more American Indian/Alaska Native, Asian, Black, and Hispanic LMI borrowers purchased in 2022 than in 2018, similar to the overall trend.

Figure 4: LMI Share of Loans Peaked in 2020



Source: Author’s calculations of HMDA data.

Table 2: Number of LMI Loans Roughly Back to Pre-Pandemic Levels

	2018	2019	2020	2021	2022	2018– Peak (% Ch)	2018– 2022 (% Ch)
Low- to Moderate- Income	985,501	1,042,521	1,221,473	1,240,828	970,926	25.9%	-1.5%
Middle- Income	940,344	992,447	1,101,405	1,168,336	952,855	24.2%	1.3%
High- Income	1,536,009	1,565,724	1,649,174	1,858,528	1,518,575	21.0%	-1.1%

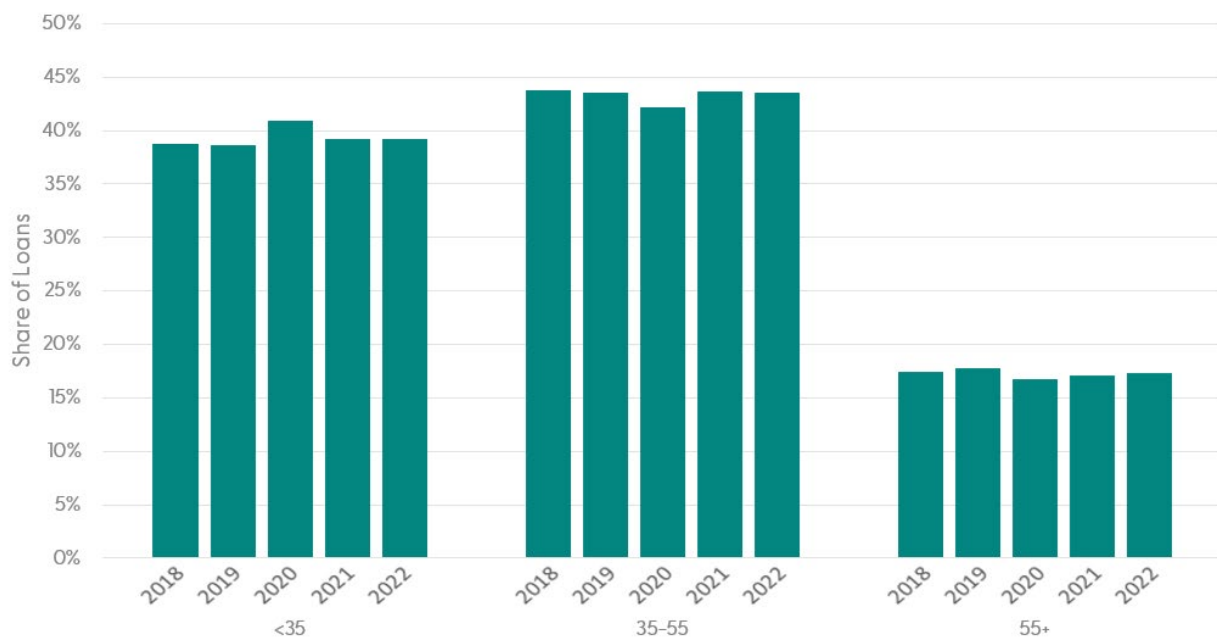
Source: Author’s calculations of HMDA data.

More Young Borrowers in 2022 Than 2018

Trends on younger borrowers suggest that homebuying also became more accessible to them during the pandemic period. The share of loans going to buyers younger than 35 peaked in 2020, at 40.9 percent (Figure 5), while the number of younger borrowers peaked a year later, at 1.69 million (Table 3). By 2022, the number of loans to younger buyers in 2022 subsided to 2018 levels.

Again, broad trends were similar across racial/ethnic groups, but magnitudes differed across them. The share of younger borrowers peaked in 2020 for all groups before declining. Declines in the share of younger borrowers were sharper for Native Hawaiian and Pacific Islander (−3.9 percentage points), Black (−3.8 percentage points), Native American Indian and Alaska Native (−2.6 percentage points), and Hispanic borrowers (−2.0 percentage points) than for White (−1.2 percentage points) and Asian (−0.9 percentage point) borrowers.

Figure 5: Share of Loans Going to Young Buyers Peaked in 2020



Source: Author's calculations of HMDA data.

Table 3: Number of Loans to Younger Buyers Peaked in 2021 and Remain Above 2018 Level

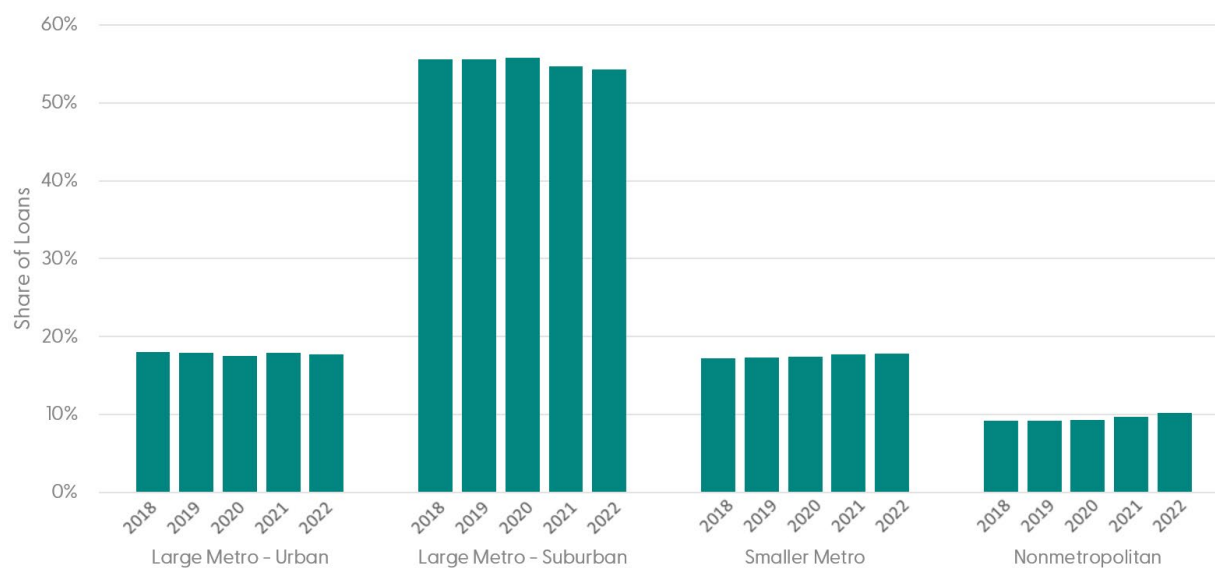
	2018	2019	2020	2021	2022	2018– Peak (% Ch)	2018– 2022 (% Ch)
<35	1,354,776	1,402,143	1,638,792	1,687,288	1,359,929	24.5%	0.4%
35–54	1,528,263	1,582,832	1,691,804	1,882,049	1,510,534	23.1%	–1.2%
55+	608,097	645,818	674,883	735,914	602,253	21.0%	–1.0%

Source: Author’s calculations of HMDA data.

Where Were These Homes Located?

Changes in home-purchase loan patterns by metro type—urban (large metro), suburban (large metro), smaller metro, nonmetro—suggest both pandemic blips and possible new trends. In line with common narratives and expectations around residential preferences during the pandemic, the HMDA data show a 0.4-percentage-point decline in the share of purchase loans made in urban areas in 2020 relative to 2019, as shares in the suburban areas of large metros rose (0.2 percentage point) (Figure 6). Though the number of loans made in all types of metros increased in 2020, growth in the urban cores was most muted (Table 4). Trends for urban areas reversed, however, in 2021. From 2018 to 2022, there was a shift away from larger metros toward smaller metros and nonmetro areas. This expansion is most notable in nonmetro places, which saw 10.1 percent more loans in 2022 than in 2018 and which experienced the largest growth in their share of all loans (1.0 percentage point).

Figure 6: Urban Areas Saw Smaller Share of Loans in 2020, but the Decline Was Temporary



Source: Author's calculations of HMDA data.

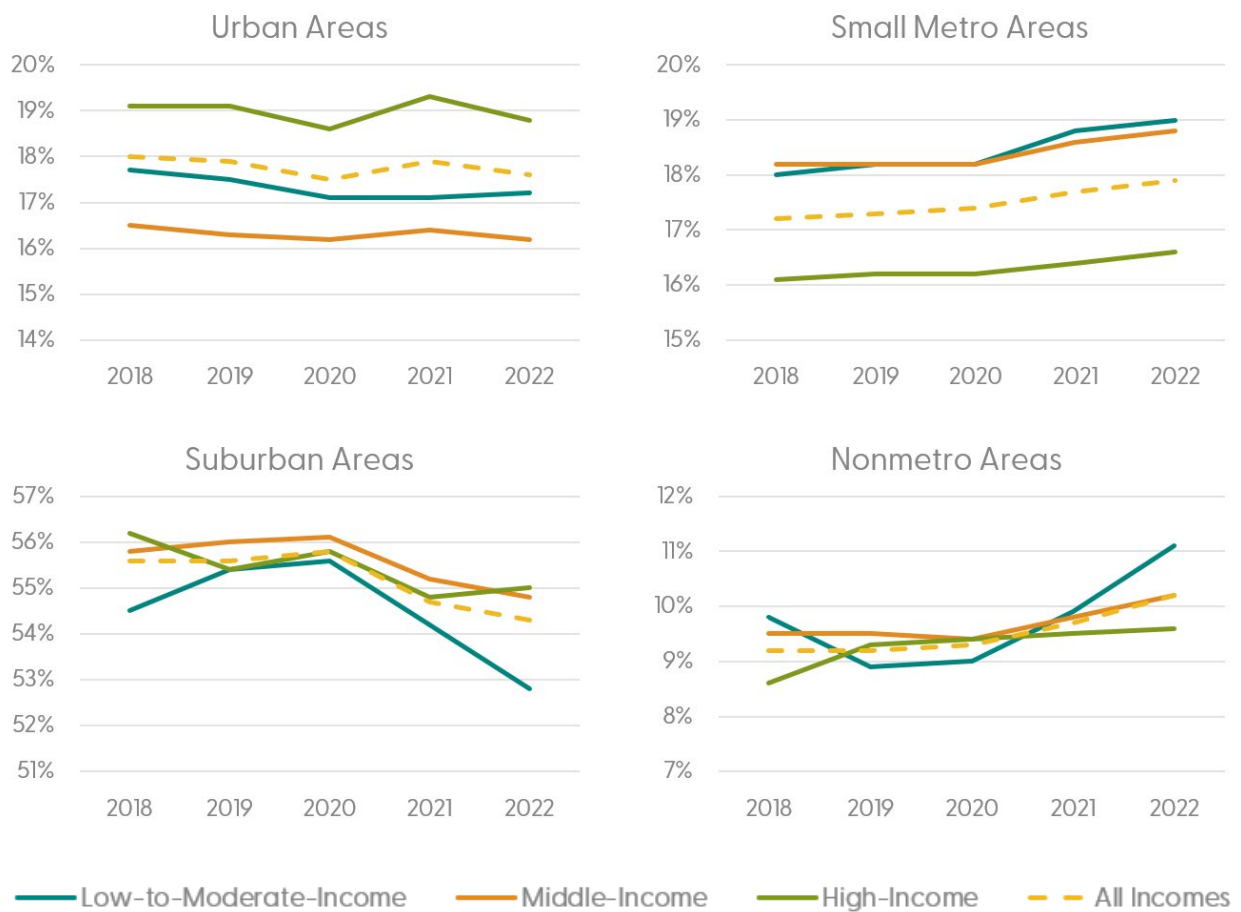
Table 4: Nonmetro Areas Experienced Greater Growth in Number of Loans as a Share of Previous Activity

	2018	2019	2020	2021	2022	2018– Peak (% Ch)	2018– 2022 (% Ch)
Large Metro – Urban	628,283	650,247	700,371	770,825	614,134	22.7%	–2.3%
Large Metro – Suburban	1,942,911	2,018,605	2,237,478	2,356,721	1,886,600	21.3%	–2.9%
Smaller Metro	600,792	628,861	696,202	761,768	619,884	26.8%	3.2%
Nonmetropolitan	320,573	334,353	372,287	417,094	353,072	30.1%	10.1%

Source: Author's calculations of HMDA data.

These geographic trends show significant variation by income level. In urban areas, the decline in loan share was evident across income groups before the pandemic, but the rebound was driven by higher-income borrowers (Figure 7). In the suburbs, the share of LMI and middle-income borrowers fell off steeply in 2021 and 2022. All income groups increased the share of borrowers in smaller metro areas and nonmetropolitan areas throughout this period, though the growth was largest for LMI borrowers, particularly in nonmetro areas, in 2021 and 2022.

Figure 7: Trends Across Metro Types Varied by Income



Note: Axes are not to scale across charts but were selected to highlight within-metro type variation by income group.

Source: Author's calculations of HMDA data.



Regional Variations

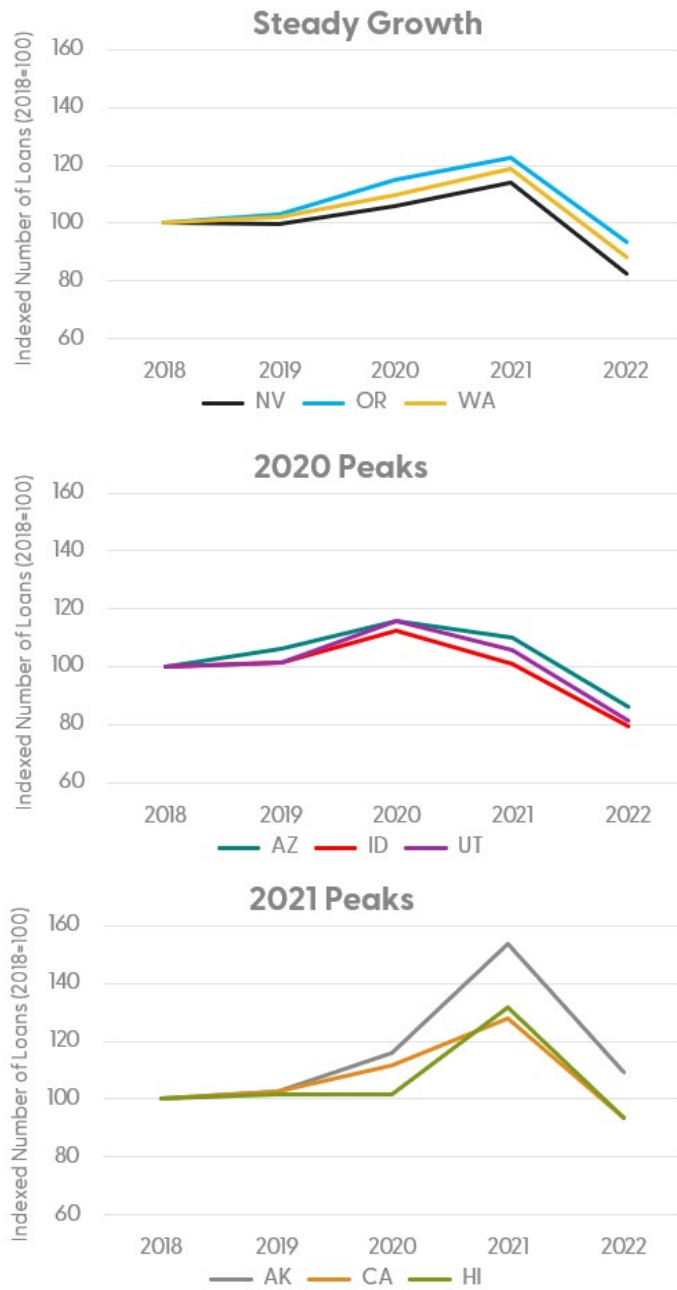
National data, while illuminative of the general state of the market, can hide more localized variations in housing markets. This section uses the states in the 12th District of the Federal Reserve to highlight some of these regional nuances.

Looking at changes in home-purchase loan volumes across the nine states in the 12th District shows that there were three different trends in these states (Figure 8). First were states that experienced roughly steady growth that preceded the pandemic, before shrinking in 2022. Nevada, Oregon, and Washington met this pattern. Second were states that experienced a peak in 2020 before a slowdown in 2021 and sharp contractions into 2022. Arizona, Idaho, and Utah followed this trend. Finally, in Alaska, California, and Hawaii, the peak in homebuying activity occurred in 2021, and while the contraction in 2022 was sharp relative to the 2021 peak, the 2022 levels of these states were closer to 2018 than for most other states in the district. All 12th District states, except for Alaska, had lower loan volumes in 2022 than in 2018.

These trends both validate and complicate some of the national narratives that emerged during the pandemic. Idaho and Utah, mountain states with many smaller and non-urban markets, saw large increases in activity in 2020; however, this surge was limited to the first pandemic year, rather than an indicator of fundamentally shifting buying patterns. Meanwhile, despite experiencing a decline in population,⁴⁰ California still registered a sharp increase in homebuying activity in 2021.


State trends on the shares of homebuyers of color roughly mirror what was seen in the national data. Homebuyers of color generally saw their share increase over this period, with larger increases seen in 2021 and 2022. These trends also roughly hold across racial groups, with a few exceptions. As in the national data, Native American and American Indian borrowers and Native Hawaiian and Pacific Islander borrowers experienced very little growth in their share of the home-purchase loan market in most states. And, in an indication that there may be growing constraints for these groups in states where they represent a larger share of the population, the share of loans to American Indians and Alaska Natives made in Alaska was at its highest level in 2018. Similarly, the share of loans going to Native Hawaiians and Pacific Islanders decreased each year in Hawaii.

Figure 8: States Experienced Different Pandemic Markets



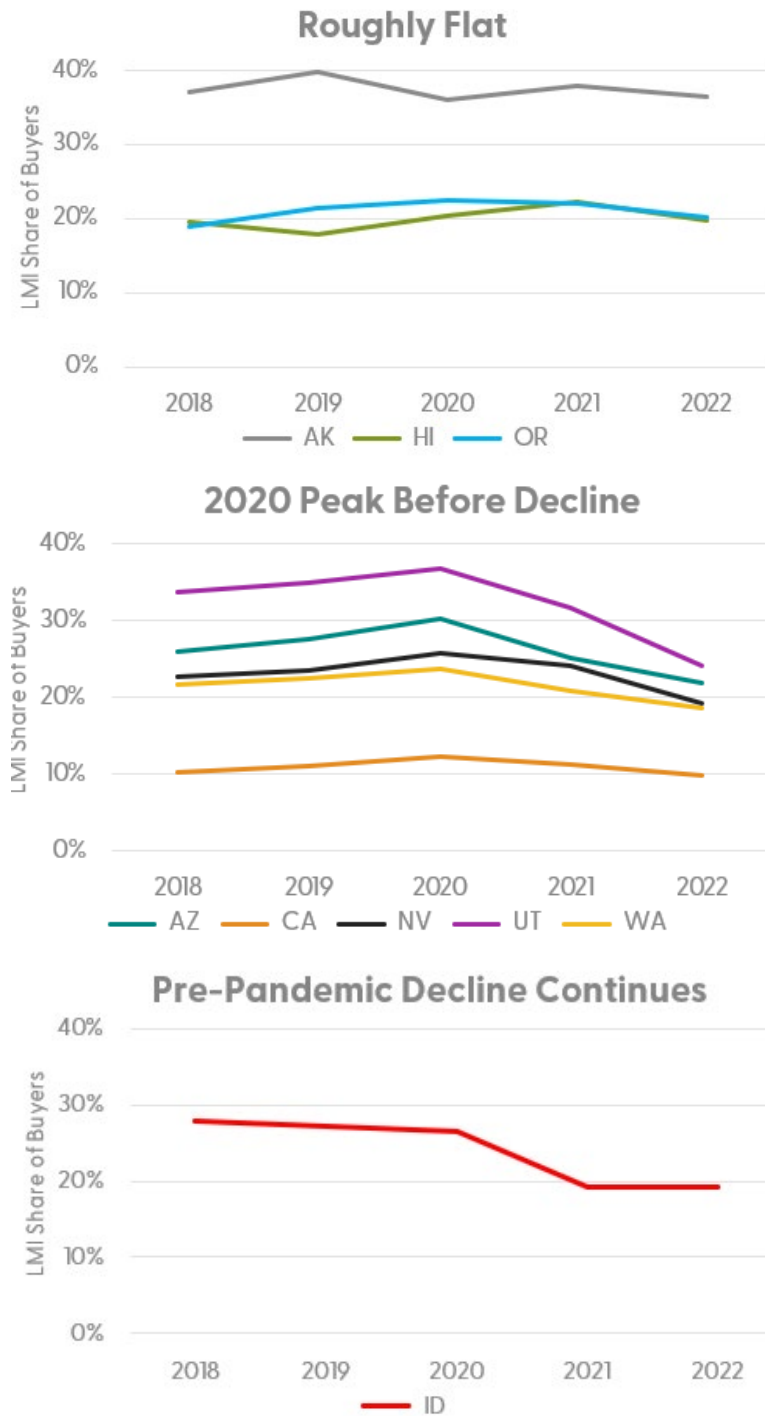
Note: Loan volumes are shown indexed to 2018 to facilitate comparison across states with very different market sizes.

Source: Author's calculations of HMDA data.



The share of loans going to LMI borrowers in the 12th District similarly mirrors the U.S. trend, with a peak in 2020. However, the LMI share is lower in the 12th District than nationally in all years, and the declines since 2020 have been sharper in this district. Across 12th District states, three trends emerge (Figure 9). In Alaska, Hawaii, and Oregon, LMI shares are roughly flat throughout this period, with some fluctuations but no trendline. In most 12th District states (Arizona, California, Nevada, Utah, and Washington), the LMI share follows the national trend, peaking in 2020 before declining. Declines were particularly sharp in Utah and Arizona, relative to other states. Meanwhile, in Idaho, the LMI share declined every year since 2018, though it appears to have stabilized from 2021 to 2022.

Figure 9: LMI Share of Borrowers Varied across the 12th District



Source: Author's calculations of HMDA data.



Discussion and Conclusion


Two major findings about historically marginalized groups emerge from this data. First, 2020 saw gains in participation in the homebuying market for historically marginalized groups, both in terms of total counts and shares. Second, despite a contraction in the homebuying market in 2022, the number of loans going to groups who have historically struggled to participate in the homebuying market were at least roughly in line with 2018 levels (for LMI and young borrowers), if not substantially above where they were in 2018 (for borrowers of color).⁴¹

In addition, this analysis confirms that, although geographic shifts did occur, the reported urban exodus was relatively muted for homebuyers. In 2020, there indeed appeared to be a shift away from the urban areas of the nation's largest metro areas. However, urban cores rebounded to near pre-pandemic levels after 2020, while the suburban areas of these major metros represented a shrinking share of loans. Smaller metros and nonmetro areas continued their pre-pandemic growth in shares of all home-purchase loans throughout this five-year period.

The Pandemic Period Ushered in a Period of Peak Homebuying That Benefited Historically Marginalized Groups

Despite (or perhaps partially due to) the upheaval caused by the COVID-19 pandemic, 2020 and 2021 became banner years for homebuying in markets across the United States. Record low interest rates, coupled with changes in consumer demand and preferences for different types of housing and neighborhoods, led to peaks in home-purchase loans and a concomitant rise in the homeownership rate across racial and income groups through 2022. Although many housing markets became very competitive during this time, with multiple offers and sales above list price, buyers of all types appeared to be able to participate in the market. In particular, buyers from groups who have historically struggled to participate in the market—buyers of color, lower-income buyers, and younger homebuyers—saw growth in their share of home-purchase mortgages over this period.

Though the homeownership rates of these groups remain well below those of White, higher-income, or older buyers, the growth in homeownership during this time was meaningful. At the end of 2022, the homeownership rate for Black households (at 45.9 percent) was at its highest levels since 2010; for Hispanic households, the




homeownership rate (at 48.7 percent) was at its highest since 2009.⁴² The trend is similar for lower-income households (defined as below-median in the Housing Vacancy Survey) and households younger than 35.⁴³

In 2022, the market contracted as rising prices and interest rates changed the affordability calculus. Although the share of purchase loans to LMI borrowers and borrowers younger than 35 peaked in 2020, conditions for these groups (and most borrowers of color) in 2022 were roughly in line with or better than 2018. LMI borrowers had slightly smaller shares (–0.3 percentage point less) and total number of loans than in 2018 (–1.5 percent fewer). Meanwhile, younger borrowers had a larger number of loans in 2022 (0.4 percent more), and these represented a larger share of home-purchase loans in 2022 than in 2018 (0.4 percentage point more). Borrowers of color, on the other hand, saw their number of loans rise by 17.8 percent, relative to 2018, and had a 6.0–percentage–point increase in their share of all loans. These gains are particularly notable given that 2022 was a more challenging home-purchase environment in many markets compared with 2018: though prices in many places declined relative to their pandemic highs, they remained elevated, and interest rates were significantly higher than in 2018.

Many Factors Helped Shape Favorable Homebuying Conditions

Demographic shifts may be a contributing factor in the growth of younger buyers and buyers of color. A variety of economic and social conditions kept many millennials as renters at ages when older generations had already purchased homes. That said, millennials are currently the largest generation,⁴⁴ growing numbers of renters among them are earning salaries that could support a home purchase,⁴⁵ and the demographic pressures (e.g., aging, marriage, and having children) that often result in a transition to homeownership may have accumulated enough for substantial numbers of this group to become homeowners. Freddie Mac data suggest the number of first-time homebuyers grew 22 percent from 2020 to 2021 among loans financed by the agency and was at its highest level since the organization began tracking it in 1994.⁴⁶ Millennials are also a more racially diverse generation than those that came before it, so growth in millennial homebuyers may naturally come with growth in the number of buyers of color. Additionally, across demographic groups, shifts in housing demand during the pandemic may have resulted in household formation and inspired many to begin shopping for homes; these new households and home shoppers who



were not able to purchase before the contraction in the market may remain poised to reenter if affordability (or personal financial) conditions improve.


The behavior of the stock market and government responses to pandemic conditions also may have created favorable conditions for homebuying. The stock market experienced a strong 2020 and 2021, and wealth grew across demographic groups from 2019 to 2022.⁴⁷ Additionally, personal savings during the pandemic surged above levels suggested by pre-pandemic trends, potentially due, in part, to fiscal support.⁴⁸ Some households may have used this additional wealth and savings to fund down payments.

The geographic shifts to smaller metros and nonmetro areas also may be contributing to increased activity among historically excluded groups. These smaller communities are generally more affordable than big metro areas. Shifts in buying patterns to these areas means that, on average, more affordable homes are being purchased, enabling affordability across a variety of financial constraints, from lower incomes to lower down payments or credit scores.

Tightening Market Conditions Have Reduced Affordability and Curbed Homebuying Activity

After a boom in 2020 and 2021, the home sales market contracted significantly in 2022, as rising interest rates combined with high home prices to change the affordability calculus. Though prices in most metro areas peaked sometime in 2021 or 2022, in some areas, they had already begun to rebound by the end of 2023.⁴⁹ And despite 2022 declines, prices, in aggregate, remain well above their pre-pandemic levels in most metros. Meanwhile, mortgage interest rates remained high throughout 2023 and in 2024 (at the time of this writing).


This combination is creating two major tensions in the home sales market. First, for those who are currently renters, homebuying is historically unaffordable, with national affordability at lows not seen since before the Great Recession.⁵⁰ Second, many homeowners are feeling “locked in” to their current homes, even if they would prefer to move. Redfin estimates that more than 85 percent of homeowners with mortgages have mortgages with interest rates below 6 percent and more than 57 percent have loans with rates below 4 percent,⁵¹ while prevailing rates on 30-year mortgages remained above 6.5 percent until August 2024.⁵² This difference in mortgage interest



rates means that the majority of homeowners who want to move face a substantial increase in monthly mortgage payments with a new mortgage unless they buy a property of lower value or are able to make a large down payment to make the loan smaller. This is likely contributing to homeowners choosing not to move, decreasing the supply of homes available for sale, and further aggravating the affordability crisis. One estimate suggests that this pattern, referred to as “the mortgage lock-in effect” resulted in a decrease in home sales with fixed-rate mortgages of 57 percent in the fourth quarter of 2023, compared with the average sales rate from 2000 to 2023, and resulted in an estimated 1.33 million fewer sales between the second quarter of 2022 and the end of 2023.⁵³ They further estimate that this decrease in the supply of homes for sale contributed to a 5.7 percent increase in home prices.⁵⁴ These headwinds may be felt more acutely in some local markets, in that the effect of mortgage lock-in, in terms of the average difference in monthly mortgage payments between new and old interest rates, is most acute in high-cost areas where home prices (and loan values) are higher. And though not examined in depth in this paper, additional analysis of HMDA data points to trends among LMI borrowers within some metro areas that suggest significant declines relative to national averages.

Affordability Shifts Could Make These Changes Sticky and Lock Out Marginalized Buyers

Though some of the homebuying trends during the pandemic appear to have been short-lived, with returns to pre-pandemic trends, the volume of home purchases during this period, coupled with the significant change in market conditions in recent years, means that these purchases may have lasting impacts for individual buyers and their communities. As mentioned in the previous section, the lock-in effect, combined with current home prices, could result in individual buyers who would otherwise prefer to move feeling that they are not financially able to. Those who moved to farther-flung areas at the peak of the pandemic and remote work may be grappling with longer commutes, as many offices have returned to in-person or hybrid work styles. Others may have outgrown their living quarters or want to move to follow job opportunities. These households now face the decision of compromising on their housing demands—either by staying where they are or looking at smaller or less amenity-rich homes or neighborhoods—or shuffling their monthly budgets and cutting savings or other expenditures to accommodate higher housing costs.



At the community level, this lock-in effect has reduced the supply of homes for sale, keeping prices elevated. Even in places where prices have moderated or declined, those who bought at the peak may be hesitant to sell at a loss, absent significant hardship in their personal circumstances. And households who were unable to purchase during the low-interest-rate period may struggle to enter the homeownership market under combined higher interest rates and home prices. For pandemic boomtowns that experienced substantial price appreciation and in-migration during this period, this may mean that renter populations, especially those that are LMI, may be even further from achieving homeownership than before the pandemic and could remain shut out for several years until housing markets reach a new equilibrium.

This research contributes to the growing literature on housing demand from a particularly tumultuous moment in the housing market. Further research could focus on sources of regional variation from the national trends or examine interactions between types of buyers and/or places highlighted in this report, such as buyers with coborrowers of different races, LMI buyers in smaller metros, or marginalized buyers in markets with particularly elevated investor purchase activity. Future work could also explore the relationships between price changes, localized measures of affordability, and different types of geographies.

It is also important to continue to monitor the trends highlighted in this paper. Although gains were made from 2018 to 2022 for homebuyers from historically marginalized groups, current market conditions are likely to disproportionately impact these groups (as they are more likely to struggle to become homeowners in unaffordable and competitive markets), which could stall or potentially reverse pandemic-era gains. Additionally, regional variations in access by marginalized groups may point to additional advantages or constraints in local markets. Community development practitioners can consider the trends highlighted in this paper as they assess their local housing markets and design responses to the latest housing conditions.



Appendix - Investor and Cash Purchases

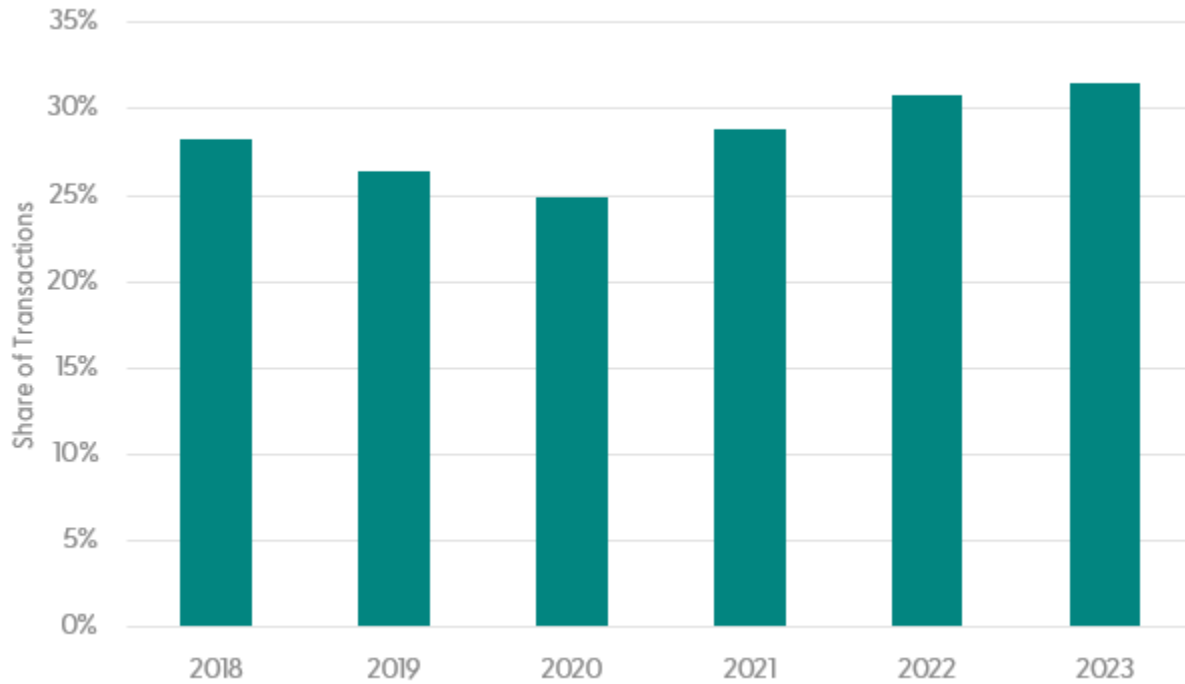
One component of the competitive housing market of 2020 and 2021 that received a lot of media attention was the growth in investor purchases and in buyers using cash. Investor purchases of single-family homes (both for use as rentals and as “flips”) grew in the wake of the Great Recession and has drawn increasing attention from scholars, media, and policymakers alike.⁵⁵ During the pandemic, a new type of cash buyer entered the narrative: those relocating from high- to low-cost areas, able to pay cash due to the difference in incomes or housing values between high- and low-cost areas.⁵⁶ Of course, these types of buyers had always existed, but the availability of remote work, particularly for high-paying, remote-work-compatible professions, may have increased the feasibility of these kinds of moves and home purchases.

In reality, investor and cash purchases slowed relative to those made by non-investors or buyers using financing, before their shares increased in the post-pandemic period. The year 2020 was a nadir for cash and investor shares, though 2019 was also muted, compared with the post-pandemic years. Research from CoreLogic found that, after bottoming out in the first months of the pandemic, investor purchase volumes climbed throughout much of the rest of 2020. But their share as a total of all sales in 2020 was below their pre-pandemic level, as non-investor homebuyers primarily drove the 2020 boom.⁵⁷ These trends shifted in 2021 as cash and investor purchases picked up steam: various industry analyses show both cash sales and sales to investors increased their share of all purchases in late 2021 into 2022.⁵⁸ The cash and investor shares continued to grow in 2023, with the investor share hitting a record high in the final quarter of the year⁵⁹ and the cash-purchase share reaching levels not seen since 2014.⁶⁰

Using data from CoreLogic, I examined the share of transactions for properties identified as single-family, condos, and duplexes⁶¹ that were cash (as opposed to mortgaged) from 2018 to 2023 for 324 metropolitan statistical areas for which data were available and sufficiently reliable across all years of the data.⁶² These data confirm trends cited in the previous paragraph. The number of total transactions that occurred with cash (as opposed to a mortgage) declined from 2018 to 2020, as did the share of cash transactions, dropping to 24.8 percent in 2020 (Figure 10). The number of cash transactions surged in 2021 before declining in 2022 and 2023. However, the share of cash transactions grew every year after 2020, jumping to 28.8 percent in 2021 and rising to 31.5 percent in 2023. Though this general trend held across many metropolitan

statistical areas, there is substantial regional variation, both in the presence of cash buyers and in their trends over time.

Figure 10: Cash Sales as Share of Total Single-Family, Condo, and Duplex Transactions Declined until 2020 before Rebounding



Source: Author's calculations of CoreLogic data.




Notes

¹ See, for example, Adolfo Flores, “The Californization of the Texas Housing Market - WSJ,” *Wall Street Journal*, October 10, 2023, <https://www.wsj.com/economy/housing/texas-housing-california-migration-affordability-a50c78f>; Brittany De Lea, “New York Exodus Accelerates amid Pandemic as Some Residents Head South,” *FOXBusiness*, September 1, 2020, <https://www.foxbusiness.com/real-estate/nyc-move-outs-surge-pandemic>; Anna Bahney, “New York and California Saw an Exodus in 2020. Here’s Where People Are Moving to,” *CNN Business*, February 1, 2021, <https://www.cnn.com/2021/02/01/success/new-york-california-exodus-2020-pandemic/index.html>.

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³ Peter H. Haslag and Daniel Weagley, “From L.A. to Boise: How Migration Has Changed during the COVID-19 Pandemic,” *SSRN Electronic Journal*, 2021, <https://doi.org/10.2139/ssrn.3808326>.



⁴ Haslag and Weagley; Wenli Li and Yichen Su, “The Great Reshuffle: Residential Sorting during the COVID-19 Pandemic and Its Welfare Implications,” SSRN Scholarly Paper (Rochester, NY, January 27, 2023), <https://doi.org/10.2139/ssrn.3997810>.

⁵ Haslag and Weagley, “From L.A. to Boise.”

⁶ Li and Su, “The Great Reshuffle.”


⁷ Haslag and Weagley, “From L.A. to Boise”; Li and Su, “The Great Reshuffle”; Stephan D. Whitaker, “Migrants from High-Cost, Large Metro Areas during the COVID-19 Pandemic, Their Destinations, and How Many Could Follow,” Cleveland Fed District Data Brief, no. 20210325 (March 25, 2021), <https://doi.org/10.26509/frbc-ddb-20210325>.

⁸ Haslag and Weagley, “From L.A. to Boise”; Whitaker, “Migrants from High-Cost, Large Metro Areas during the COVID-19 Pandemic, Their Destinations, and How Many Could Follow.”

⁹ Haslag and Weagley, “From L.A. to Boise”; Li and Su, “The Great Reshuffle.”

¹⁰ William H. Frey, “New Census Data Shows a Huge Spike in Movement Out of Big Metro Areas during the Pandemic,” *Brookings Commentary* (blog), April 14, 2022, <https://www.brookings.edu/blog/the-avenue/2022/04/14/new-census-data-shows-a-huge-spike-in-movement-out-of-big-metro-areas-during-the-pandemic/>; William H. Frey, “Big Cities Saw Historic Population Losses While Suburban Growth Declined during the Pandemic,” *Brookings Research* (blog), July 11, 2022, <https://www.brookings.edu/articles/big-cities-saw-historic-population-losses-while-suburban-growth-declined-during-the-pandemic/>.

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¹² Frey, “Big Cities Saw Historic Population Losses While Suburban Growth Declined during the Pandemic.”

¹³ Li and Su, “The Great Reshuffle”; Frey, “Big Cities Saw Historic Population Losses While Suburban Growth Declined during the Pandemic”; Frey, “New Census Data Shows a Huge Spike in Movement Out of Big Metro Areas during the Pandemic.”

¹⁴ Frey, “Pandemic-Driven Population Declines in Large Urban Areas Are Slowing or Reversing, Latest Census Data Shows.”

¹⁵ Ibid.

¹⁶ Whitaker, “Migrants from High-Cost, Large Metro Areas during the COVID-19 Pandemic, Their Destinations, and How Many Could Follow.”

¹⁷ Frey, “Pandemic-Driven Population Declines in Large Urban Areas Are Slowing or Reversing, Latest Census Data Shows.”

¹⁸ William H. Frey, “New Census Data Hints at an Urban Population Revival, Assisted by Immigration” (Washington, DC: Brookings Institution, April 15, 2024), <https://www.brookings.edu/articles/new-census-data-hints-at-an-urban-population-revival-assisted-by-immigration/>.

¹⁹ Stephan D. Whitaker, “Urban and Regional Migration Estimates: Will Your City Recover from the Pandemic?” Cleveland Fed District Data Brief, August 8, 2023, <https://doi.org/10.26509/frbc-ddb-20230803>.

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²² Ibid.

²³ Ibid.

²⁴ Federal Reserve Bank of Atlanta, “Home Ownership Affordability Monitor,” accessed April 4, 2024, <https://www.atlantafed.org/center-for-housing-and-policy/data-and-tools/home-ownership-affordability-monitor>.


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²⁶ John A. Mondragon and Johannes Wieland, “Housing Demand and Remote Work,” Working Paper, Working Paper Series (National Bureau of Economic Research, May 2022), <https://doi.org/10.3386/w30041>.

²⁷ William Gamber, James Graham, and Anirudh Yadav, “Stuck at Home: Housing Demand during the COVID-19 Pandemic,” *Journal of Housing Economics*, COVID-19’s Impacts on Housing Markets, 59 (March 1, 2023): 101908, <https://doi.org/10.1016/j.jhe.2022.101908>.

²⁸ Matt Klesta, “Home Lending Trends from Select Counties in Kentucky, Ohio, and Pennsylvania: 2018–2022,” *Community Development Reports*, no. 20240418 (April 18, 2024), <https://doi.org/10.26509/frbc-cd-20240418>.

²⁹ For reference, the share of loans being used for owner-occupants in 2022 was 87.8 percent. Across time, the share of loans being used for owner-occupants increased from 89.3 percent in 2018 to 89.8 percent in 2020 before declining in 2021. Owner-occupants represent the largest share among Black borrowers, at 95.3 percent (averaged across all years), and the smallest share among Asian borrowers, at 82.5



percent. White borrowers were owner-occupants 90.1 percent of the time. The youngest borrowers (younger than 35) were most likely to be owner-occupiers, at 96.6 percent, while the oldest borrowers (55 and older) were least likely, at 81.6 percent.

³⁰ Like many other analyses of HMDA data, this analysis excludes manufactured housing. This represents roughly 3 percent of the otherwise eligible purchase loans during the study period. Loans for manufactured housing may or may not include the real estate on which the home is located, making them challenging to compare with mortgage loans for site-built homes.

³¹ This results in a loss of 0.2 percent of the sample.


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³³ Populations as of 2021 1-Year American Community Survey.

³⁴ This typology helps parse the jurisdictions that make up the urban core of these regional economies and housing markets from the communities and suburbs that surround them. However, it does not directly speak to the makeup of the housing stock or affordability of the local housing market.

³⁵ Median income data are supplied in HMDA, with the MSA definition that is applicable in that year. For 2018, the MSA definitions used for median income and the MSA definitions used for assigning geography are not consistent.

³⁶ Though multiple races can be selected in HMDA reporting, only 1.6 percent of the sample reports more than one race. Given the diversity of this multiracial group and its small size, I follow convention by reporting the borrower’s primary race or ethnicity.



³⁷ Housing Vacancy Survey, “Table 6. Homeownership Rates by Race and Ethnicity” (U.S. Census Bureau, 2023).

³⁸ Ibid.

³⁹ Although low- and moderate-income (LMI) households are assessed together, it is interesting to note that relatively few homebuyers are low-income, representing between 6.8 and 7.3 percent of buyers in any given year; as a result, the majority of LMI buyers are actually moderate-income, earning between 50–80 percent of AMI.


⁴⁰ Natalie Holmes and Evan White, “Pandemic Patterns: California Is Seeing Fewer Entrances and More Exits (Corrected),” *California Policy Lab* (blog), April 14, 2022, <https://capolicylab.org/pandemic-patterns-california-is-seeing-fewer-entrances-and-more-exits-april-2022-update/>.

⁴¹ As mentioned in the methods section, these data represent home-purchase mortgages (excluding cash buyers) and exclude second-home buyers and investors who used mortgages to purchase their investment properties. Given that these types of buyers are likely to be higher-income, older, and whiter than the average homebuyer, these populations are likely underrepresented in the data used in this paper. Though this is true in every year studied, given the growth in investment and cash-buying activity since 2021, this discrepancy is more likely to be exaggerated in 2022 and at its smallest level in 2020, when investor and cash activity were at low levels relative to before the pandemic.

⁴² Excluding 2020, for which there are known data collection issues.

⁴³ Housing Vacancy Survey, “Table 6. Homeownership Rates by Race and Ethnicity”; “Table 17. Homeownership Rates by Family Income: 1994 to Present”; “Table 12a. Household Estimates for the United States, by Age of Householder: 2000 to Present.”

⁴⁴ Richard Fry, “Millennials Overtake Baby Boomers as America’s Largest Generation,” *Pew Research Center* (blog), April 28, 2020, <https://www.pewresearch.org/short->



reads/2020/04/28/millennials-overtake-baby-boomers-as-americas-largest-generation/.

⁴⁵ Sam Khater and Ralph DeFranco, “What Drove Home Price Growth and Can It Continue?” Research Note (Washington, DC: Freddie Mac, June 9, 2022), <https://www.freddiemac.com/research/insight/20220609-what-drove-home-price-growth-and-can-it-continue>.

⁴⁶ Ibid.

⁴⁷ Aditya Aladangady et al., “Changes in US Family Finances from 2019 to 2022” (Washington, DC: Board of Governors of the Federal Reserve System, 2023), <https://doi.org/10.17016/8799>.

⁴⁸ Hamza Abdelrahman and Luiz E. Oliveira, “The Rise and Fall of Pandemic Excess Savings,” Economic Letter (San Francisco, CA: Federal Reserve Bank of San Francisco, May 8, 2023), <https://www.frbsf.org/research-and-insights/publications/economic-letter/2023/05/rise-and-fall-of-pandemic-excess-savings>.

⁴⁹ Author’s calculations of Zillow Home Value Index.


⁵⁰ Federal Reserve Bank of Atlanta, “Home Ownership Affordability Monitor.”

⁵¹ Katz, Lily. “6 of Every 7 People With Mortgages Have an Interest Rate Below 6%, But the Lock-In Effect Is Starting to Ease.” Redfin News (blog), August 27, 2024. <https://www.redfin.com/news/mortgage-rate-lock-in-housing-2024/>.

⁵² Freddie Mac, “Primary Mortgage Market Survey.”

⁵³ Ross M Batzer et al., “The Lock-In Effect of Rising Mortgage Rates,” Staff Working Papers (Washington, DC: Federal Housing Finance Agency, March 18, 2024), <https://www.fhfa.gov/research/papers/wp2403>.

⁵⁴ Ibid.



⁵⁵ Ben Horowitz and Libby Starling, “Rise in Investor-Owned Single-Family Rentals Prompts Policy Responses” (Minneapolis, MN: Federal Reserve Bank of Minneapolis, March 27, 2024), <https://www.minneapolisfed.org/article/2024/rise-in-investor-owned-single-family-rentals-prompts-policy-responses>.


⁵⁶ See, for example, <https://www.oregonlive.com/realestate/2021/05/out-of-staters-are-buying-oregon-homes-with-cash-and-remodeling-sight-unseen-real-estate-agents-say.html> or <https://www.wptv.com/money/real-estate-news/middle-class-residents-face-housing-challenges-as-new-money-moves-into-palm-beach-county>.

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⁵⁹ Thomas Malone, “US Home Investor Share Reached New High in Q4 2023,” CoreLogic®, April 9, 2024, <https://www.corelogic.com/intelligence/us-home-investor-share-reached-new-high-q4-2023/>.

⁶⁰ Lautz, “The Share of All Cash Buyers Highest Since 2014 at 32% of All Buyers”; Anderson, “1 in 3 U.S. Homebuyers Are Paying All Cash, the Highest Share in Nearly a Decade.”



⁶¹ Transactions in the CoreLogic data were limited to residential, arms-length, non-foreclosed, non-mobile housing that were classified as single-family residences, condos, and duplexes.

⁶² In many cases, the sum of cash purchases and mortgage purchases do not sum to total purchases; in these cases, an error rate was calculated at the MSA level for what percentage of transactions were not classified as either cash or mortgaged. MSAs with an error rate of 5 percent or greater in 2018 were excluded from the analysis. This resulted in the loss of 60 MSAs.



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