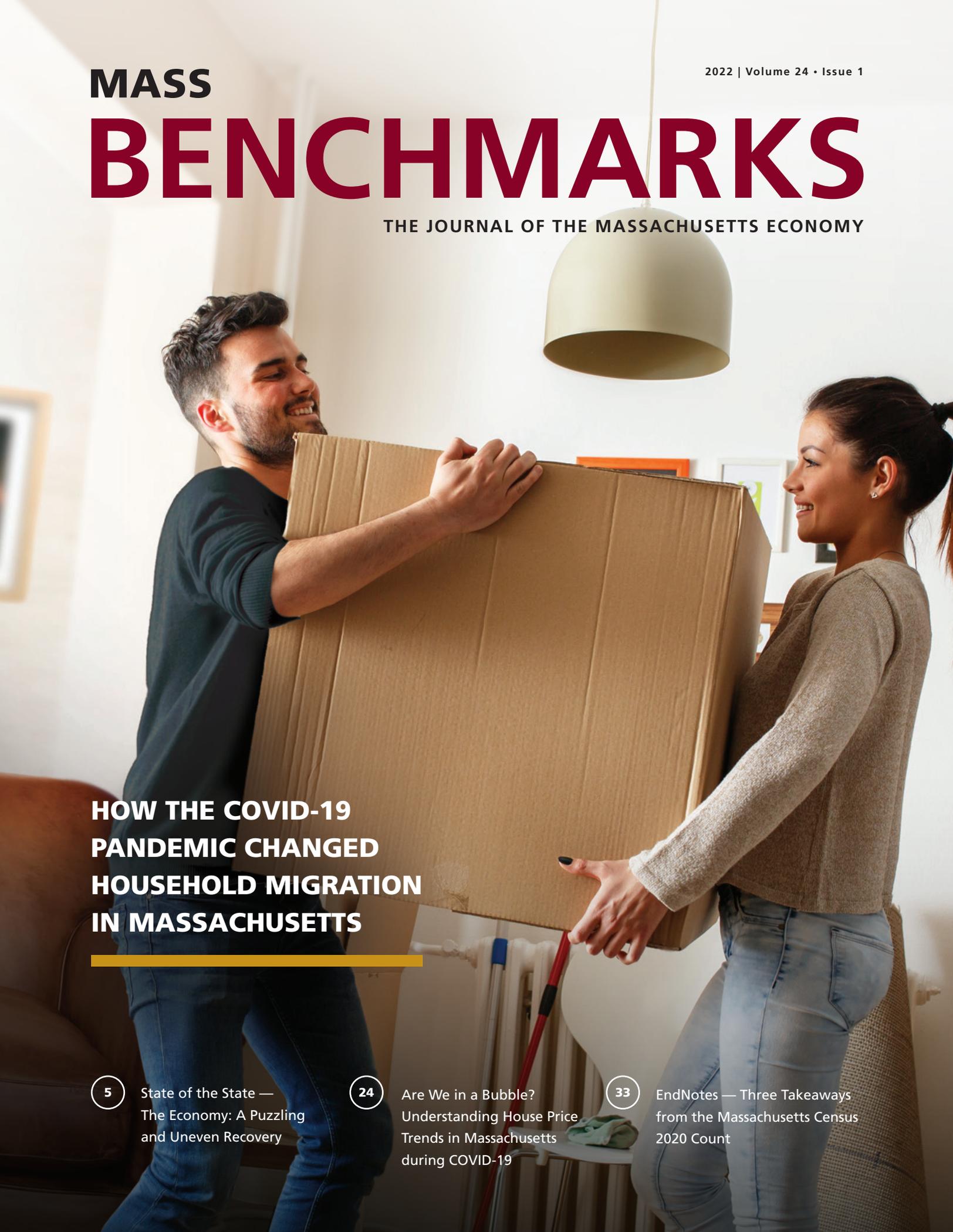


MASS

2022 | Volume 24 • Issue 1

BENCHMARKS

THE JOURNAL OF THE MASSACHUSETTS ECONOMY



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from the Massachusetts Census
2020 Count



MassBenchmarks provides timely information about the Massachusetts economy, including reports, commentary, and data about the state's regions and industry sectors that comprise them.

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This MassBenchmarks arrives during a time of considerable geopolitical and economic uncertainty. As always, the issue provides a rigorous assessment of state economic conditions and yields important insights into several key issues weighing heavily on the economic outlook for both Massachusetts and the country. With the omicron surge in the COVID-19 pandemic seemingly behind us, the state and national economy continues moving forward in recovery mode despite several significant challenges, including the war in Ukraine, rising energy and consumer prices, and labor and other supply constraints.

In the opening State of the State article, MassBenchmarks Executive Editor and Professor Emeritus of Economics at the Isenberg School of Management Robert Nakosteen and Mark Melnik, Senior Managing Editor and Director of Economic and Public Policy Research at the UMass Donahue Institute, review current state economic conditions which they describe as currently experiencing a “puzzling and uneven recovery.” Their analysis highlights regional labor market conditions and longstanding demographic challenges including the sobering finding that in 2021 state deaths outnumbered state births for the first time. They conclude their analysis with uncertainty about the future given the unknown trajectory of the pandemic and threats to future growth presented by significant labor supply constraints.

The feature articles examine in depth two challenges directly influencing the ability of the Commonwealth to attract and retain its workforce: migration and the cost of living, particularly recent price trends in the housing market.

In the first of these articles, Nicholas Chiumenti of the Federal Reserve Bank of Boston examines interstate migration in New England and

documents both a “spike” in change of address requests during the early phases of the pandemic in Spring 2020 but also a slowing of permanent movements into and out of New England. While this pattern is encouraging given slowing population growth and ongoing labor supply concerns in the Bay State, Chiumenti warns this declining out-migration may be temporary, and the earlier movement out of the commonwealth observed during the worst of the pandemic may presage intentions for future permanent moves.

Current housing price trends in Massachusetts are the focus of the second feature article by Dr. Keren Horn of UMass Boston (UMB) and recent UMB alumna Charlotte Burlingame. Despite the historic economic downturn experienced during the worst of the pandemic, housing prices in Massachusetts have continued to rise robustly, a seemingly counter-intuitive development. While the authors do not conclude Massachusetts is experiencing a “housing bubble,” they highlight the scarcity of homes on the market and the inadequate production of new housing units, especially in communities and regions experiencing the highest price increases. As Horn and Burlingame observe, “over 50 percent of towns in Massachusetts have built no new housing between 2010 and 2020.”

The issue concludes with a review of the 2020 decennial Census results, authored by Susan Strate, Senior Program Manager of the Population Estimates Program at the UMass Donahue Institute. In this piece, Strate identifies three major takeaways from this critically important decennial snapshot of social, economic, and demographic conditions in our Commonwealth.

The analysis and insights contained in this latest issue of MassBenchmarks will be useful and timely for state and local officials, and business and labor leaders across the commonwealth.

A handwritten signature in black ink, which appears to read "K. Subbaswamy". The signature is fluid and cursive, written in a professional style.

Kumble R. Subbaswamy
Chancellor of the University of Massachusetts Amherst



The U.S. and Massachusetts economies continue to recover from the COVID-19 recession; however, recent economic conditions reflect multiple, serious uncertainties.

Concerns about the war in Ukraine and its ripple effects — including inflation and increased volatility in financial markets — cloud the outlook.



Meetings of the MassBenchmarks editorial board provide a forum for discussions on current conditions and the outlook for the Massachusetts economy. Editors are also able to confer and respond during economic turbulence. This piece, written by Alan Clayton-Matthews, with review from members of our editorial team, answers critical questions about rapidly evolving economic conditions.

How did national and state economies perform last year?

Both the U.S. and Massachusetts economies grew robustly as they continued to recover from the COVID-19 recession. On an annual basis, real gross domestic product in Massachusetts grew 6.4 percent in 2021, slightly faster than in the U.S. at 5.7 percent. This was the strongest annual growth since 2000 for Massachusetts and since 1984 for the U.S. Payroll employment growth was also strong. From December 2020 to December 2021, the number of jobs grew 5.5 percent in Massachusetts and 4.7 percent in the U.S. Over this same period, the unemployment rate fell from 7.7 percent to 4.6 percent in Massachusetts and from 6.7 to 3.9 percent in the US.

Has the economy fully recovered from the COVID-19 recession?

While real GDP had surpassed its pre-COVID peak by the middle of last year, both the number of jobs and the unemployment rate are still shy of their pre-COVID benchmarks. In March, U.S. payroll employment was 1.0 percent below the February 2020 peak. Comparatively, Massachusetts payroll employment was 3.1 percent below the February 2020 peak. The U.S. unemployment rate in March, at 3.6 percent, was only 0.1 percentage point above that of February 2020, while the Massachusetts unemployment rate in February, at 4.7 percent, was still 1.8 percentage points above its February value of 2.9 percentage points.

However, the February 2020 pre-COVID peak may not be the right benchmark for gauging the extent of the recovery, since demographic changes in the population over the last two years have likely moved the labor market's goal posts. In particular, unemployment and

labor force participation rates signaling full employment have probably changed in the past two years due to demographic shifts. The U.S. labor force participation rate remains about one percentage point below its February 2020 level, and supplemental questions added to the Current Population Survey suggest that both employment and the labor force could grow if the COVID threat continues to recede.

The analysis for Massachusetts is more complicated. Although the state's labor force participation rate as of February 2022 had regained its February 2020 value (65.9 percent), the state's elevated unemployment rate suggests there is untapped potential for employment growth. On the other hand, Massachusetts experienced a decline of 0.3 percent in its working-age population since February 2020, a loss that poses a downside risk to further employment growth.

What impacts on the economy do you expect from the Russian invasion of Ukraine?

Russia and Ukraine are not huge trading partners of the U.S., but the loss of the flow of goods and commodities from these countries have impacts on food and commodity prices and supply chains. We have already seen sharp rises in energy, gasoline, and food prices, as well as increased volatility in financial markets. The shift of European demand for energy from Russia to the rest of the world could benefit domestic oil and gas producers, but uncertainty about the duration of the conflict does not give a clear signal to either carbon-based energy or green energy investors or producers. Meanwhile, the supply disruptions mean that inflation will not subside as soon as hoped.

What about inflation? Why are economists worried about it?

Inflation is running at 40-year highs. Inflation had been stable for decades and for much of this century the worry has been too little inflation rather than too much. Economists view stable low inflation as a good thing because it allows real wages to adjust slowly without wage rates falling. Rising inflation causes concern or distress among households, who generally lose purchasing power. Those relying on fixed incomes are hurt even more by inflation.

Economists care about inflation for other reasons as well. Unstable prices increase uncertainty for business planning, lowering both demand for investment and financing. Perhaps most of all, economists worry about the emergence of a price-wage spiral, whereby price increases beget wage rate increases, which beget more price increases, and so on. The fear is that if the Fed does not tamp down inflation quickly, this dynamic could reemerge. Some point to the example of the early 1980s, when it took double-digit interest rate hikes by the Fed to crush the inflation spiral, moves that also led to a severe double-dip recession.

Will the Fed be able to lower inflation without causing a recession?

The answer is highly uncertain. The historical record does not engender optimism, as most periods of Fed tightening to counter inflation were accompanied by recessions. However, conditions today are different in ways that complicate comparisons with previous cycles of monetary tightening. Fortunately, the economy today is strong and so may be able to absorb higher interest rates while continuing to grow.

These uncertainties are highlighted in the Fed's own economic projections from their March meeting.¹ Their median projections for GDP growth and inflation indicate that they expect to succeed in achieving a so-called soft landing, in which the economy drifts back to more moderate levels of inflation and GDP growth by late 2023 without entering a recession. At the same time, however, the Fed's Open Market Committee (FOMC) members were unanimous in expressing higher than usual uncertainty in these projections. Moreover, the risks in their projections were skewed strongly to the downside, that is, towards higher inflation and lower GDP growth.

What are the prospects for Massachusetts economic growth?

Growth in the first quarter of this year is expected to slow from the fourth quarter of last year. Expectations for U.S. GDP growth in the first quarter are in the 1.5 percent to 2.0 percent annualized range² and the data for the first two months of the year for Massachusetts appear to be in accord with this range.

In the medium term, output growth in Massachusetts could lag that of the U.S. if technology sectors lag the overall economy. There is some evidence that low interest rates and the response to the COVID-19 pandemic benefitted information technology and pharma, and that higher interest rates and the waning of the COVID threat could reverse that trend.

In the long term, however, the outlook is unchanged. On the downside, demographic trends are constraining labor force growth throughout the U.S., and somewhat more so in Massachusetts. On the upside, the state's industrial structure and skilled labor force are well suited to a long-term outlook that emphasizes the important role of the technology and science sectors in spurring economic growth through investments in information, health, and climate technologies.

Alan Clayton-Matthews, April 5, 2022

1) Federal Reserve Board, "Summary of Economic Projections", March 16, 2022.

2) According to the Federal Reserve Bank of Atlanta's GDPNow report (April 1), and the Blue Chip consensus (March 24).



The Economy:

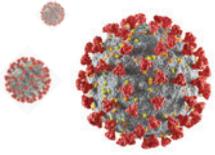
A Puzzling and Uneven Recovery

ROBERT NAKOSTEEN & MARK MELNIK

Examination of recent Gross State Product data shows that the uneven pace of recovery from the pandemic recession has continued. Unemployment rates are still dropping across industries, demographic groups, and geographic regions of the state, although disparities persist for those hardest hit by the pandemic. Fast population growth over the last decade was stymied by the pandemic, particularly through the collapse of international in-migration over the past few years. Despite recent positive trends, uncertainty and challenges remain for the immediate future for the economy, both locally and nationally.



Introduction



The term exogenous shock is now situated firmly in the vocabulary of anyone who studies the economy. Exogenous shock refers to an unexpected or unpredictable event that occurs outside the economy and has a profound impact on economic activity. The arrival of COVID-19 created just such a shock, bringing about a precipitous decline in economic activity and a very uneven, oftentimes puzzling, recovery. Moreover, the continuing pandemic has hindered this recovery and remains a threat to both public and economic health. While the economy has expanded following the second quarter of 2020, progress has been hampered by a roiled labor market, supply-chain disruptions, rising inflation, and the spread of new coronavirus variants. The recent drop in the growth of gross state product (GSP) to two percent—in an economy otherwise poised for more rapid growth—as well as increasing caseloads and hospitalizations associated first with the Delta and now the Omicron variants provide ample evidence of the continuing impact of COVID-19 and economic uncertainty heading into 2022.

Gross State Product

The sudden slowing then rapid recovery of the economy in 2020 into 2021 represents a now-familiar story. Social distancing efforts, including the broad shutdown of most service-based industries, led to an abrupt and acute level of job loss unprecedented in modern history. Robust and proactive efforts by federal and state governments helped keep businesses afloat (e.g., payroll protection), support household finances (e.g., extended unemployment benefits, direct cash payments), and keep families housed (e.g., eviction moratoria) during the height of the economic crisis caused by the pandemic. While recovery has been somewhat uneven, GSP is now above the level achieved just before the onset of the pandemic, and its rate of growth remained above the historical average through the fourth quarter of 2021.¹

The whipsaw effect of the start of the pandemic saw GSP first drop by over 31 percent (all rates of change are annualized) and

then rise by over 35 percent. Even after this sharp increase in economic activity, GSP grew at rates above historical norms. While the Delta variant contributed to slower growth in the third quarter, the strong growth in the fourth quarter reflects in part the respite from COVID infections in the fall. The Omicron variant began to affect the state and national economies only at the end of the fourth quarter.

The disruption to global supply chains due to the pandemic also affected GDP. Ironically, current imports to the United States are above their pre-COVID levels, and product shipments within the United States are fast approaching their pre-COVID levels. A large part of what is driving supply-chain issues is the increase in national demand for manufactured goods. Despite a decline in service purchases by consumers—predictable when the economy went “remote”—there was an uptick in the purchase of products, especially durable products (i.e., those that last at least two years, such as appliances, furniture, etc.). Already disrupted supply chains simply could not adjust to the dramatic shift in household spending patterns and the increased volume of shipments for consumer goods.²

Jobs, Unemployment, and the Labor Force

The Massachusetts unemployment rate, which fell to below three percent before the pandemic and then spiked to over 16 percent in April 2020, is now down to 3.9 percent. More revealing are data showing total job losses and gains by sector, as seen in Figure 1. Recent data from the Current Employment Statistics (CES) show that the state lost nearly 700,000 jobs due to the initial COVID-related shutdowns in April 2020. Since then, the state has recovered 537,000 jobs. This means that the Commonwealth is still nearly 155,000 short of its pre-pandemic employment peak. Most of the initial lost jobs were experienced in the leisure and hospitality industry, with a loss of over 225,000 jobs. In declining order of magnitude, following leisure and hospitality, were education and health services (119,200 jobs lost); trade (including retail trade), transportation, and utilities (114,800 jobs lost); other services (55,400); professional and business services; mining, logging, and construction (all less than 60,000 jobs lost). Not surprisingly, the gap in “recovered jobs” is most substantial in those sectors hit hardest by the

A large part of what is driving supply-chain issues is the increase in national demand for manufactured goods.





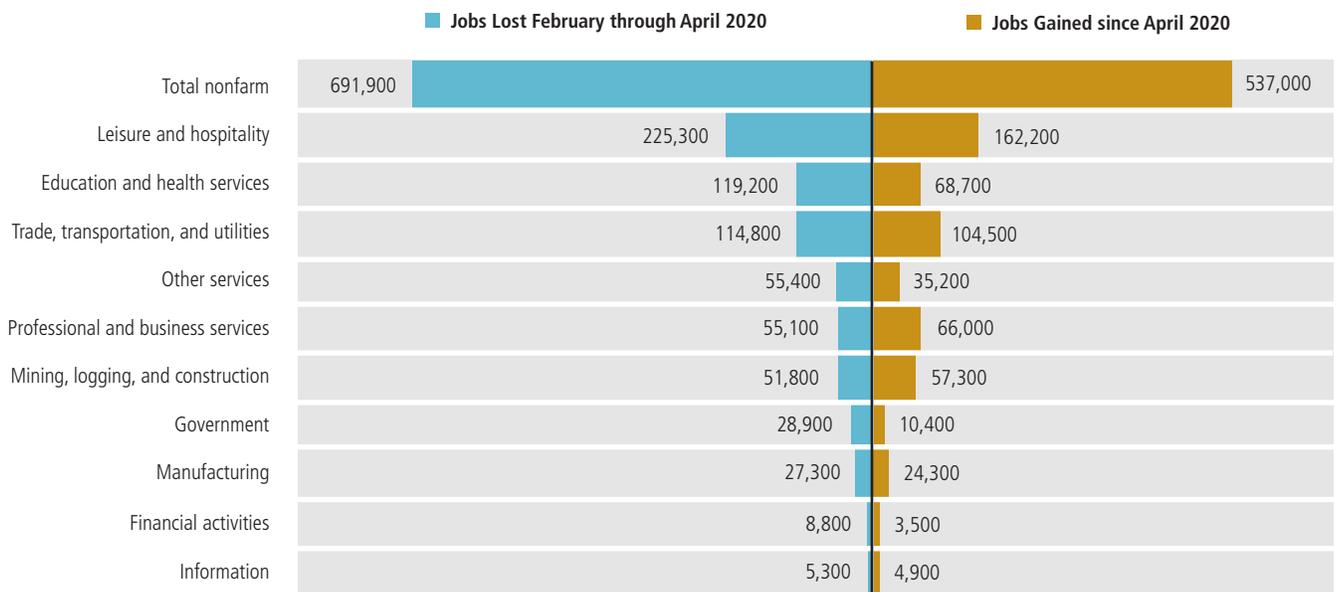
Women, people of color, young adults, and workers with limited educational attainment have all been disproportionately impacted by job losses during the pandemic.

pandemic. While leisure and hospitality and education and health services accounted for about half of the jobs lost at the beginning of the pandemic, together they represent 43 percent of the remaining job losses in the economy overall.

The economic downturn also impacted some demographic groups more significantly others. In many ways, COVID-19 has served as a “great revealer” of existing structural inequities

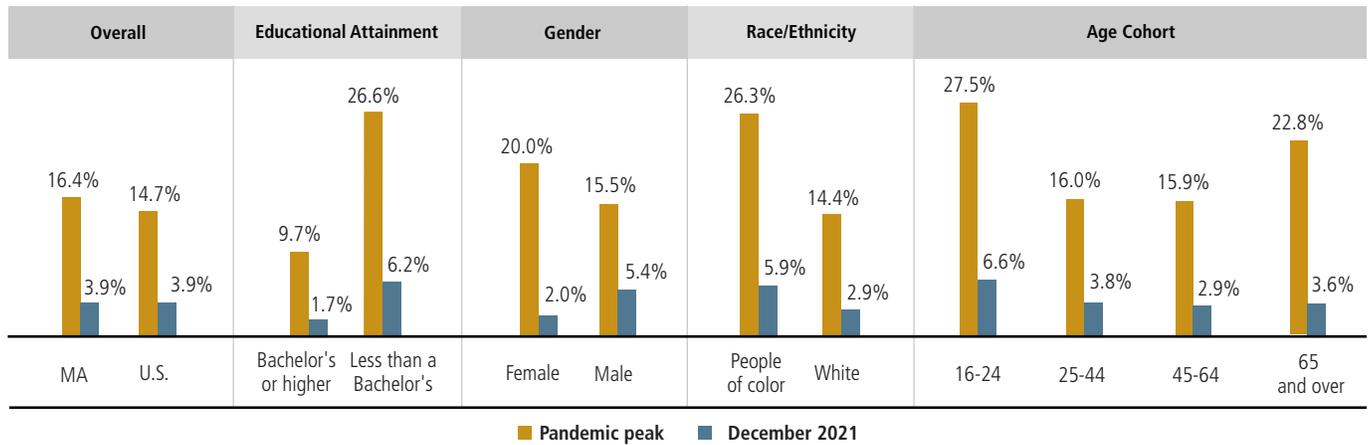
in the economy and the labor market. Women, people of color, young adults, and workers with limited educational attainment have all been disproportionately impacted by job losses during the pandemic. This is likely related to the workforce makeup of the industries most impacted by the recession and, in the case of women, increased family care responsibilities introduced by the public health crisis.

Figure 1. Pandemic Job Losses and Recovery in Massachusetts by Supersector (Seasonally Adjusted)



■ Source: Massachusetts Executive Office of Labor and Workforce Development, Current Employment Statistics (CES-790); UMDI analysis. Jobs lost represent the difference in jobs from February 2020 to April 2020. Jobs gained represent the difference in jobs from April 2020 to December 2021. ■ Note: The overall unemployment rates are seasonally adjusted, but the unemployment rates by demographics are not seasonally adjusted.

■ **Figure 2. Unemployment Rates in the Pandemic Peak versus December 2021 by Demographics**



■ Source: Massachusetts Executive Office of Labor and Workforce Development, Local Area Unemployment (LAU) Statistics; U.S. Bureau of Labor Statistics (BLS), Current Population Survey (CPS); UMDI analysis ■ Note: The overall unemployment rates are seasonally adjusted, but the unemployment rates by demographics are not seasonally adjusted.

Disaggregating the unemployment data by sex reveals a higher spike among females, which reached over 19 percent, as compared to a peak of nearly 17 percent for males. However, this pattern has disappeared as the recovery has progressed; there are currently no tangible differences between female and male unemployment rates, though female labor force participation rates continue to lag noticeably behind pre-pandemic levels.

Labor market inequities by race have been exaggerated by the pandemic, as seen in Figure 2 below. Before the pandemic, the unemployment rates for

white/non-Hispanic and people of color³ in Massachusetts were converging: 3.5 percent versus 4.2 percent. COVID-19 has changed this pattern dramatically, underscoring the economic vulnerability of low-wage workers with limited educational attainment, workers who are disproportionately young people, and workers of color. At the peak of the COVID-19 recession (April 2020), white unemployment reached 14.4 percent, while the rate spiked to over 26 percent for people of color. Currently, the white unemployment rate is 2.9 percent and the unemployment rate for people of color is nearly six percent.

There are also differences in the levels and patterns of unemployment by age. Younger workers (aged 16 to 24) have fared worse than older workers, with their unemployment rates topping 27 percent in April 2020. This trend has continued throughout the pandemic, as the unemployment rate for young adults is currently 6.6 percent, compared to 3.8 percent for those aged 25 to 44, 2.9 percent for those 45 to 64, and 3.6 percent for those 65 and over.

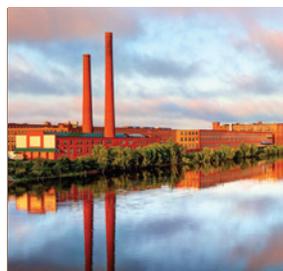
The differences in unemployment by educational attainment are also striking. For those with less than a Bachelor's degree, unemployment peaked at 26.6 percent in April 2020. Though now lower, unemployment for individuals without a Bachelor's degree is still over six percent, which is more than three times that for those with at least a Bachelor's (Figure 2).

COVID-19 has differentially affected Massachusetts cities as well. The cities hit hardest economically were Lawrence, New Bedford, and Fall River, all reaching unemployment rates at 25 percent or higher. Not coincidentally, COVID-19 caseloads were also most severe in several of the gateway cities around the state, particularly Chelsea and Lawrence, where overcrowded

MASSACHUSETTS CITIES HIT HARDEST ECONOMICALLY BY COVID-19 WITH UNEMPLOYMENT RATES AT 25 PERCENT OR HIGHER



Fall River



Lawrence

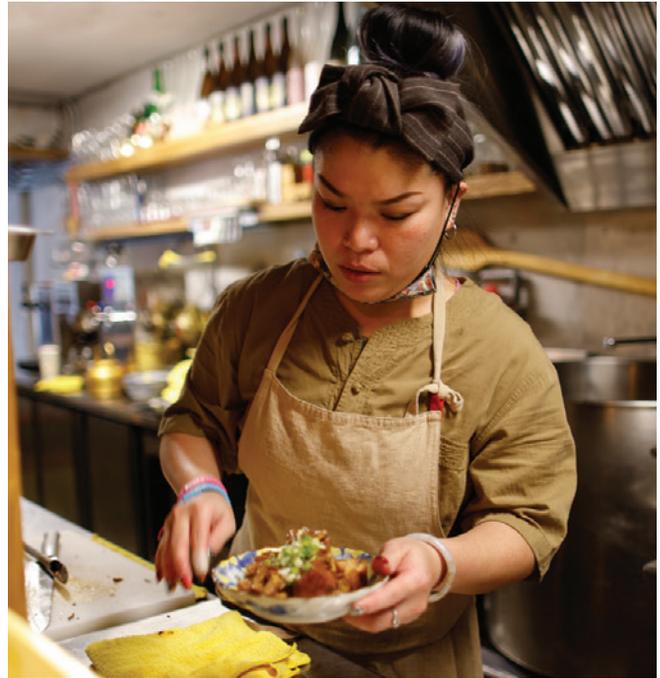


New Bedford

housing and high concentrations of workers in frontline occupations helped increase the spread of the virus. In this way, the pandemic was a significant double whammy for vulnerable populations in some of the most vulnerable communities across the Commonwealth. Unusual for an economic downturn, Barnstable recorded one of the highest rates of joblessness, at over 22 percent in April 2020—a clear indicator of the distress experienced by the tourism industry early in the pandemic. In recent months, unemployment rates for all cities in this analysis have fallen considerably. For example, while Lawrence’s is at 10 percent, this is a far cry from the 28.3 percent rate recorded in April 2020. Other metropolitan areas have experienced similar unemployment rate declines.

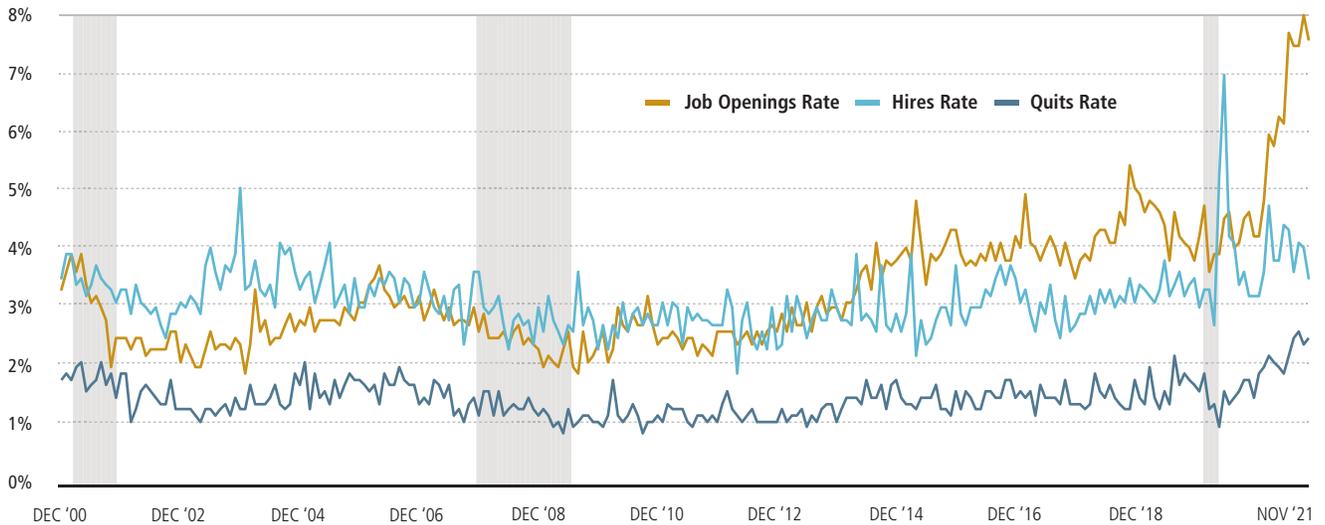
Over the last several months, considerable attention has focused on employer challenges in filling available job openings. First, there appears to be an increasing number of openings in Massachusetts relative to positions being filled. Recent data from the Jobs Opening and Labor Turnover Survey (JOLTS) show the highest job openings rate in the state’s recorded history, as seen in Figure 3 below. This has happened simultaneously with corresponding declines in the hiring rate statewide and despite elevated unemployment rates for some segments of the state’s population, signaling that skills mismatches might explain, in part, the disconnect between job openings and available labor in the state.

Similarly, the popular media focused a great deal of attention this fall on the “Great Resignation,” or the elevated number of people quitting jobs in the summer and fall of 2021. However, the Great Resignation is probably a misnomer since, while some people may have quit jobs and permanently



Over the last several months, considerable attention has focused on employer challenges in filling available job openings.

Figure 3. Massachusetts Job Openings, Hires, and Quits Rates, December 2000 – November 2021
(Seasonally Adjusted)



■ Source: U.S. Bureau of Labor Statistics, Job Openings and Labor Turnover Survey (JOLTS); UMDI analysis ■ Note: The Job Openings Rate, Hires Rate, and Quits Rate are the number of job openings, hires, and quits, respectively, during the month divided by the number of employees who worked during or received pay for the pay period that includes the 12th of the month.

left the labor force (e.g., retired, transitioned permanently to “gig” work), the majority were in fact individuals leaving one employer and taking a job with another. In that, the Great Resignation signals some worker empowerment in a surprisingly tight labor market. The “quit rate” in Massachusetts is lower than the U.S. rate, in part because of the state’s high concentration of knowledge-based industries and a well-educated labor force. That said, quit rates at both the state and national levels are rising dramatically.

While data on quit rates by industry are not yet available at the state level, there is a clear trend at the U.S. level of quits and average wages by industry. Figure 4 below shows the relationship between quit rate and average weekly earnings by industry. As the figure illustrates, the quit rate is highest in low-wage sectors like leisure and hospitality and retail trade. This further highlights the volatility in the leisure and hospitality sector; not only has the industry experienced a disproportionate share of job losses during the pandemic, but it is also experiencing high turnover within existing positions.

An additional factor influencing the apparent disconnect between available jobs and labor is the overall decline in the total labor force. While both Massachusetts and the United States have experienced sharp drops in labor force participation during the pandemic, the state’s labor force recovered more

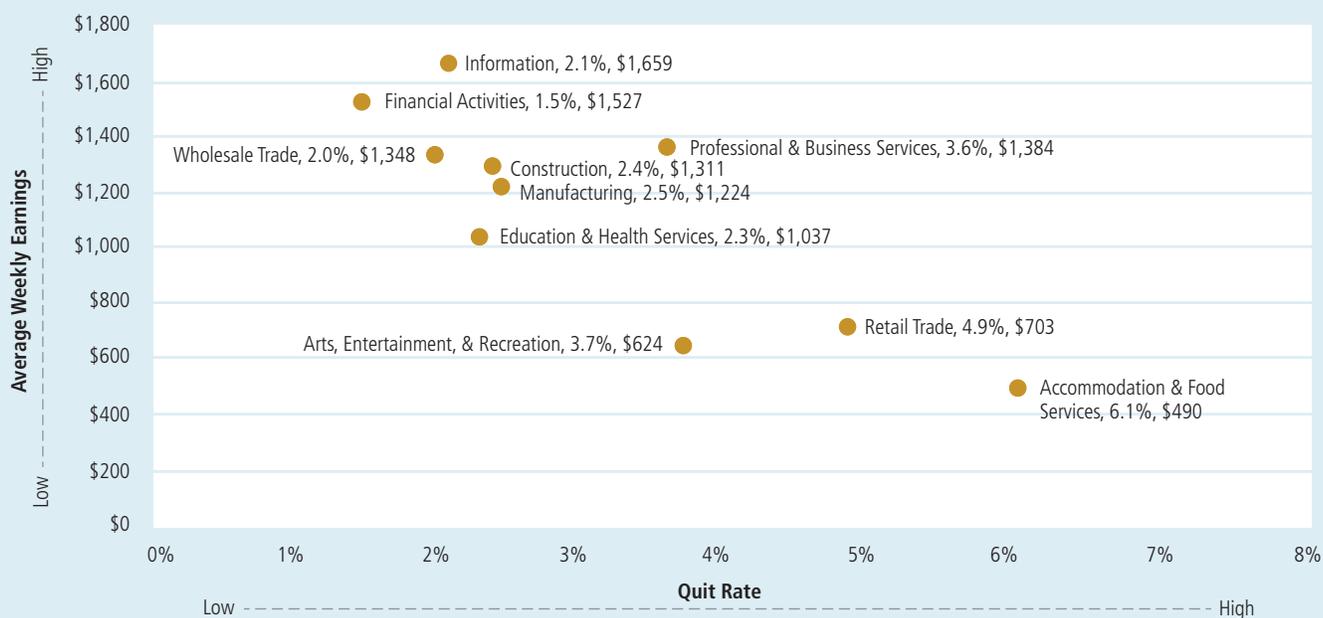
quickly and is approaching pre-pandemic levels. Part of the quick recovery is a function of the well-educated labor force in the state, as Massachusetts’ labor force participation is typically higher than the nation’s. Still, the number of workers in the labor force is smaller than it was pre-pandemic (albeit less so than a few months ago) and is putting some pressure on filling available job openings in the state.

Population Growth and Change in the Commonwealth

A central element in the state’s labor supply issues is population growth. Over the last 20 years, Massachusetts has enjoyed strong population growth, buoyed undoubtedly by the concentration of growing knowledge-based industries in the state. The 2020 U.S. Census, released well into 2021 because of the pandemic, showed this broad trend for the state decade over decade. That said, a closer inspection of year-over-year estimates for the state suggest some recent stalling in population growth, likely due to the pandemic.

According to the Census, the Massachusetts population increased by over 482,000 residents between 2010 and 2020, growing from just over 6.5 million to approximately seven

Figure 4. Job Quits Rate and Average Weekly Earnings by Industry in the United States, December 2021
(Seasonally Adjusted)

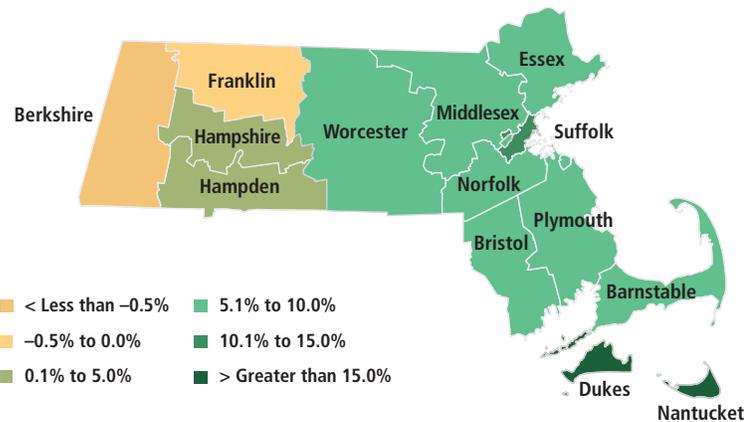


■ Source: U.S. Bureau of Labor Statistics, Job Openings and Labor Turnover Survey (JOLTS) and Current Employment Statistics (CES); UMDI analysis ■ Note: Transportation, & Utilities includes Retail and Wholesale Trade. Leisure & Hospitality includes Accommodations & Food Services and Arts, Entertainment, & Recreation. Wage data were not available for Government.

million. This 7.4 percent increase represents the fastest decade-to-decade growth Massachusetts has experienced since the 1960s, when the resident population increased by 10.5 percent from 1960 to 1970. As context, the Massachusetts population increased by 3.1 percent from 2000 to 2010 and by 5.5 percent from 1990 to 2000. Massachusetts ranked 21st in 10-year percent population change from 2010 to 2020, ahead of all other Northeast states and the Northeast average of 4.1 percent, and on par with the U.S. average of 7.4 percent.

Population growth trends in Massachusetts reflected U.S. trends over the past decade. Metropolitan areas and urban and suburban counties grew much more rapidly than small places and rural counties. Similarly, in Massachusetts, population growth has been clustered around the Greater Boston area and gateway cities (Susan Strate’s “Endnote” in this edition dives deeper into some of the state’s regional population trends). Middlesex County saw the largest growth in absolute terms and grew at a rate of 8.6 percent, followed by Essex and Worcester Counties, which grew at rates of nine percent and eight percent, respectively, all faster than the state as whole. In terms of percentage change, the fastest population growth since

■ **Figure 5. Percent Change in County Population, Census 2010 to Census 2020**



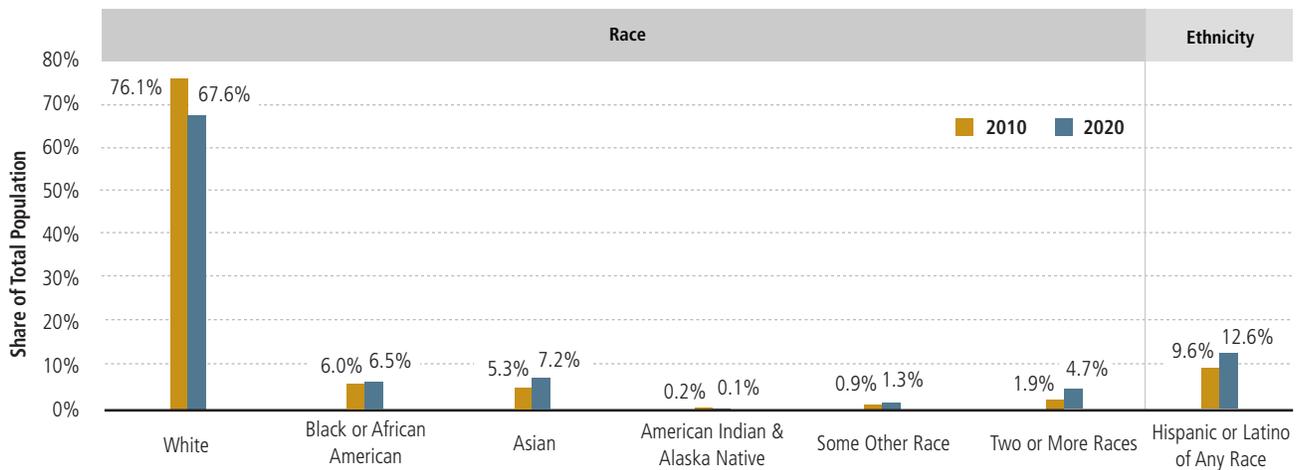
■ Source: U.S. Census Bureau; UMDI analysis

the 2010 Census was observed in the small island counties of Nantucket and Dukes, at 40.1 percent and 24.6 percent, respectively. The two western-most counties, Franklin and Berkshire, saw small population declines over the last decade (Figure 5).

As with the nation, Massachusetts is becoming more racially and ethnically diverse. The share of the population that identifies as white/non-Hispanic decreased from 76 percent to 68 percent from 2010 to 2020, while the shares that identify as Black non-Hispanic, Asian

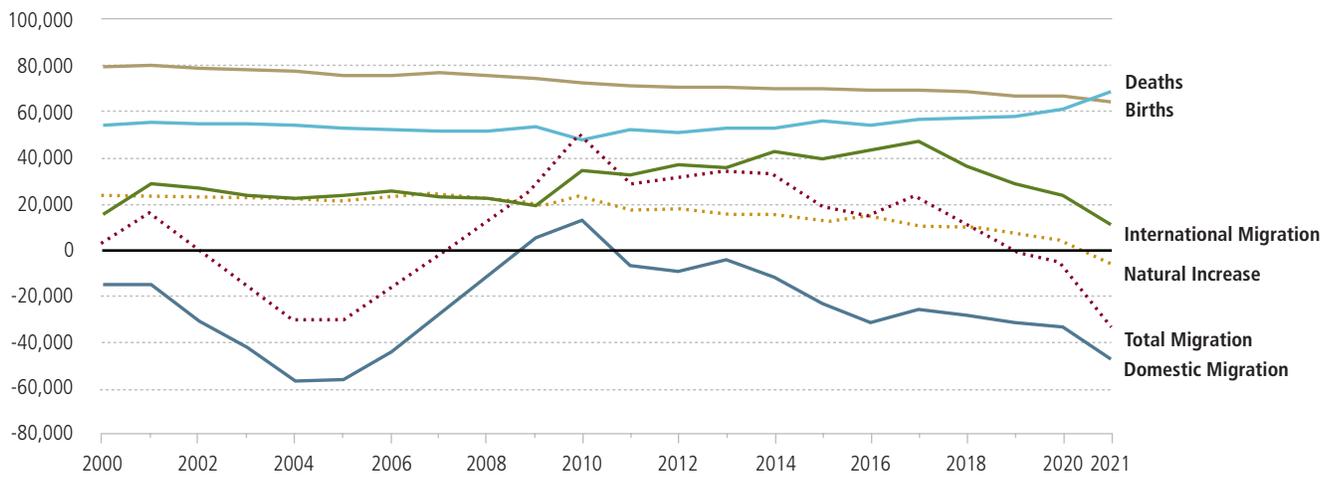
non-Hispanic, and Hispanic increased to 6.5 percent, 7.2 percent, and 12.6 percent, respectively. The share that identifies as two or more races (non-Hispanic) more than doubled to 4.7 percent (Figure 6). The state’s population is older than the nation’s as a whole, with the median age being 39.7. However, due to the presence of higher education institutions, young adults are somewhat overrepresented in the Commonwealth; 21 percent of residents are between the ages of 20 and 34 compared to 20 percent in the United States.

■ **Figure 6. Massachusetts Race and Ethnicity: 2010 to 2020**



■ Source: U.S. Census Bureau, Census 2010 Summary File 1, Census 2020 PL-91-171; UMDI analysis

Figure 7. Massachusetts Estimated Components of Population Change, 2000 – 2021



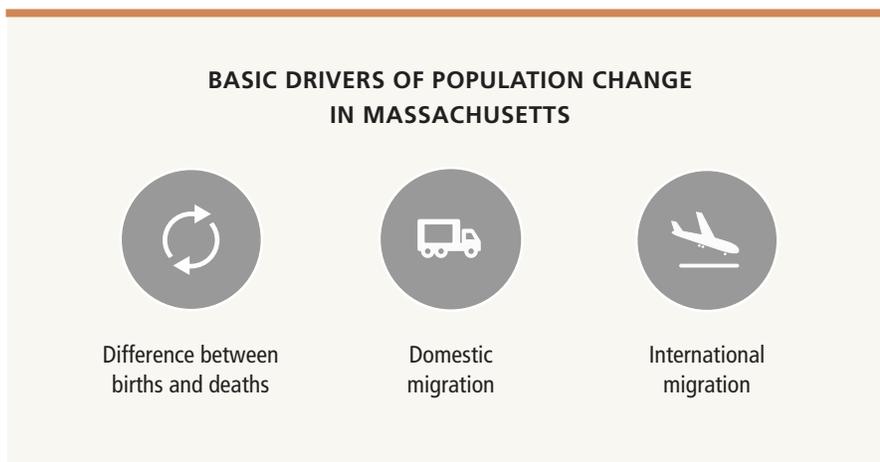
Source: U.S. Census Bureau Population Division, ST-2000-7, CO-EST2020-ALLDATA, and NST-EST-2018-ALLDATA; UMDI analysis

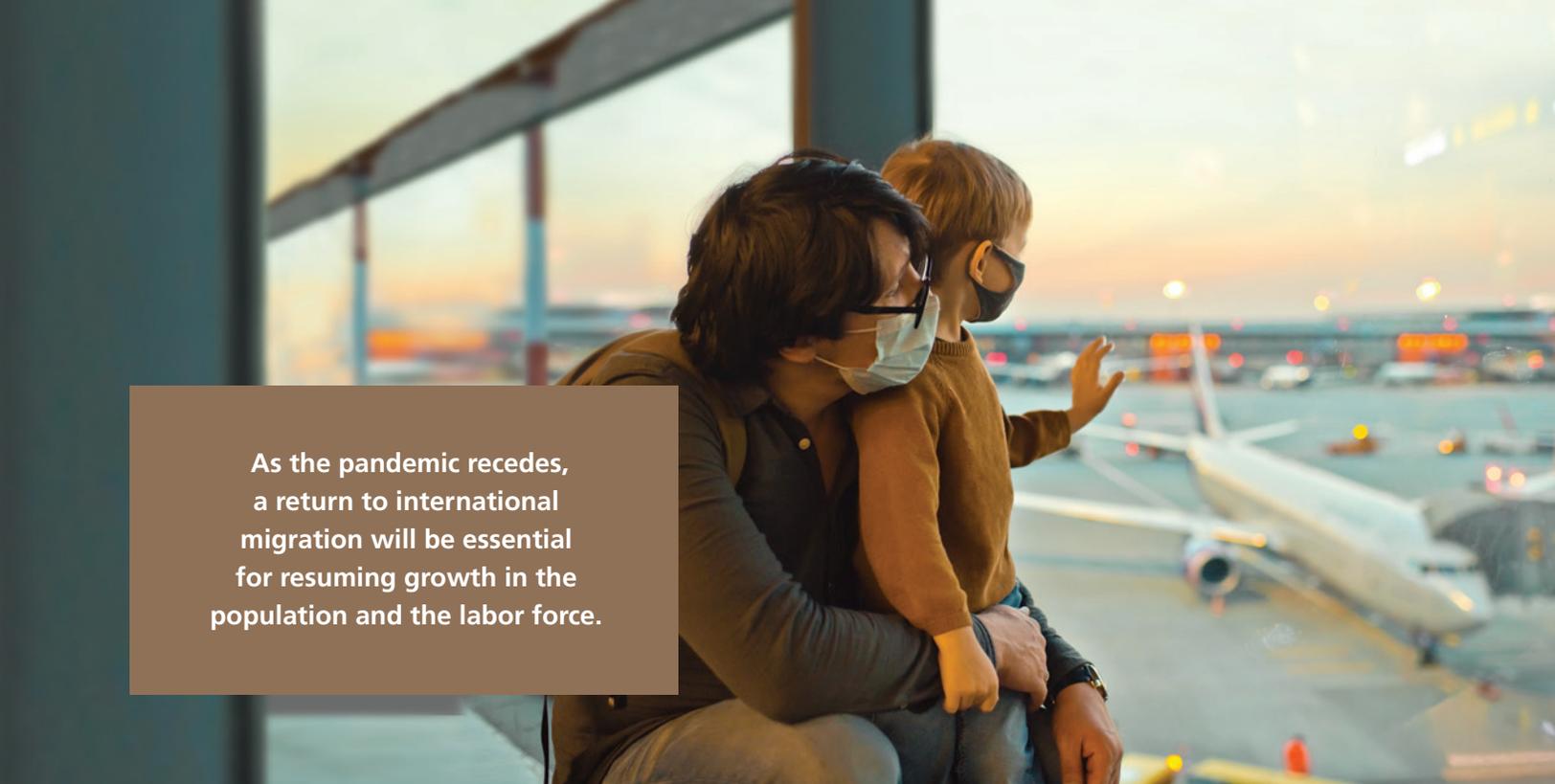
Despite the state’s strong population growth decade over decade, recent year-over-year population estimates by the Census Bureau suggest that the pandemic has negatively impacted population growth in the state. Both the 2020 (-.02%) and recently released 2021 (-0.6%) annual population estimates for Massachusetts showed a very small population decline from the previous year. This is notable because it represents the first annual declines for the state since 2004.

Three basic patterns have defined population change in the state over the

last two decades, as shown in Figure 7 above. One is that the “natural rate of population change”—that is, the difference between births and deaths—has been stagnant or has fallen. While this number is typically positive (i.e., annual births outnumber deaths), for the first time the 2021 Census estimate shows a decline in “natural change,” meaning the number of deaths in Massachusetts in 2021 was actually higher than the number of births. An aging population and decreasing fertility in the state had already been narrowing the gap between births and deaths

in previous years, but the pandemic year exacerbated the trend in both components to the extent that the 2021 estimates finally saw deaths exceeding births. This will be an important trend to continue to track in the coming years. The second pattern is the long-term trend of negative domestic out-migration. Traditionally, Massachusetts is a net loser on domestic migration, in part driven by the high churn of young adults coming to and leaving the state around their college-aged years, and the relatively high cost of living in the state. Third, international immigration is the most consistent source of population growth in the state. While immigration to the state has declined in recent years, due partly to tightened federal restrictions, changing rhetoric around immigration more broadly, and ultimately tightened travel restrictions around the pandemic, this source of population growth remains positive. The decline in net international migration in the state, however, is not enough to stem the other population losses brought on by negative natural change and domestic migration. As the pandemic recedes, a return to international migration will be essential for resuming growth in the population and the labor force.





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What's Next?

As has been the case throughout the pandemic, uncertainty defines the immediate outlook for the state and national economy. While most indicators show an economy bouncing back well following the COVID-19 recession, rising case rates and new variants of the virus continue to cloud the long-term economic outlook, especially to the degree that the pandemic continues to hamper economic activity and disrupt supply chains. Similarly, the demographic trends in the state present a telling story worth tracking from an economic perspective. Declines in the state's labor force size can impede economic growth, and the combination of reduced labor force participation (albeit modest) and net international migration signals potential limits to labor supply. This can make it difficult for employers to fill potential job openings in the state, as evidenced already during the current economic recovery. Regardless, the most central issue for the economy in 2022 is getting the pandemic back under control.

Endnotes

1) For the latest detailed discussion, see the Q4 2021 MassBenchmarks Index Bulletin at <https://donahue.umass.edu/business-groups/economic-public-policy-research/massbenchmarks/benchmarks-bulletin-january-2022>.

2) See the Federal Reserve Bank of St. Louis, Federal Reserve Economic Data (FRED) Real Imports of Goods and Services and Cass Freight Index (Shipments) data series

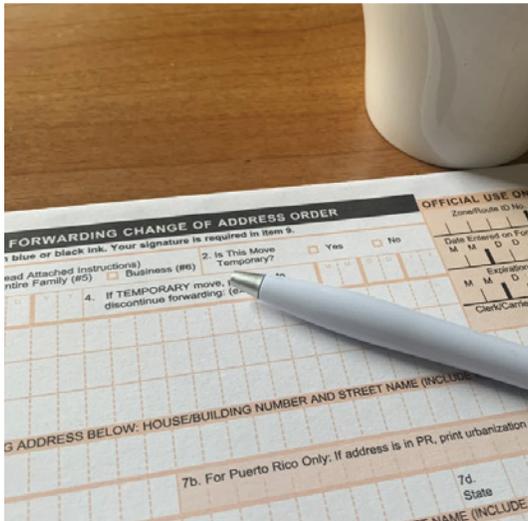
3) For this analysis, "people of color" are all non-white or Hispanic workers.



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How the COVID-19 Pandemic Changed **HOUSEHOLD MIGRATION** in Massachusetts

NICHOLAS CHIUMENTI

Change-of-address requests through the U.S. Postal Service from 2018 through 2020 tracked the effects of the pandemic on permanent and temporary migration in New England. While the total number of moves made in New England in 2020 was only modestly greater than those made in 2018 or 2019, the pandemic changed the types of moves New England households made and accelerated some preexisting regional trends. However, Massachusetts domestic migration trends differed in key ways from the rest of New England.



Using change-of-address request data from the U.S. Postal Service, this report examines how the pandemic changed household domestic migration patterns in Massachusetts and New England.

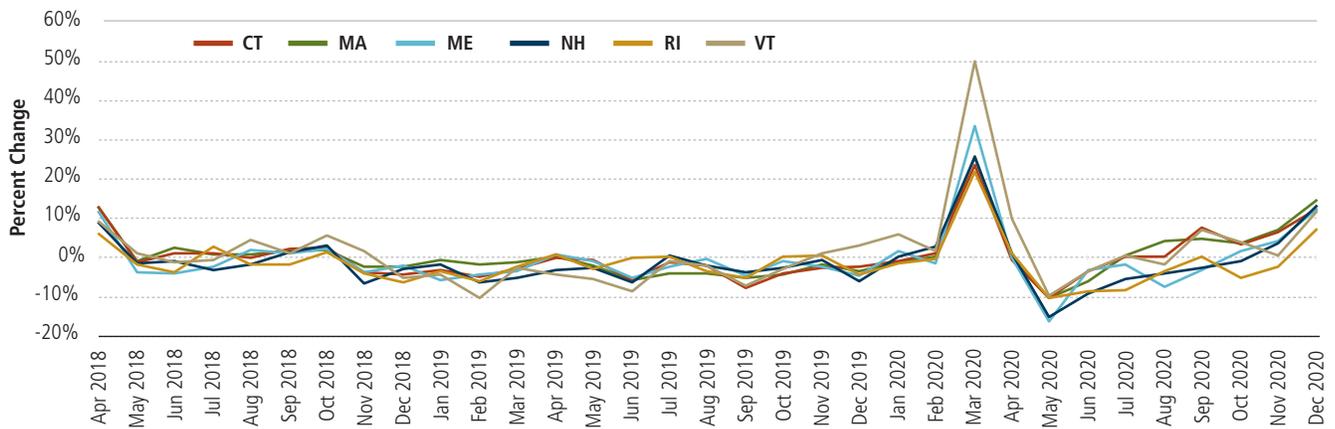
The COVID-19–related restrictions imposed initially in March 2020 that halted in-person schooling and prompted businesses to institute work-from-home policies allowed many Americans to relocate, accelerating the domestic migration out of metropolitan areas that had begun before the pandemic.¹ Using change-of-address (COA) request data from the U.S. Postal Service (USPS), this report² examines how the pandemic changed household domestic migration patterns in Massachusetts and New England, identifying the types and locations of communities that experienced net in-migration and those that saw net out-migration.³

In the two years before the pandemic, the number of monthly COA requests in each New England state varied by less than 10 percent year over year and was on the decline in 2019, as fewer people overall moved into, out of, or within the region. However, as Figure 1 shows, at the start of the pandemic, COA requests spiked: in March 2020, approximately 25 percent more COA requests were made in Massachusetts and in New England as a whole compared with March 2019. Yet, despite this surge in requests, the total number of moves made in New

England was only 2.1 percent greater in 2020 compared with 2019 and less than 1 percent more than the number of requests made in 2018.⁴ Rather, the pandemic changed the types of moves New England households made and accelerated some preexisting regional trends, though Massachusetts was often the exception to many of these changes.

In Massachusetts and throughout New England more broadly, migration plays an important role in population growth. From 2010 to 2019, 60 percent of the Commonwealth’s growth in population came from total net in-migration—the combination of both domestic and international net migration⁵—with international net migration being particularly crucial. Without people moving into Massachusetts from abroad, the state’s population would have declined during this period, since domestic net migration was negative and negated the natural increase (i.e., the number of people born in the state minus the number of deaths). Similarly, international net migration was responsible for Connecticut’s and Rhode Island’s population growth during this same period, and in northern New England, the combination of domestic and international net migration

Figure 1. Year-Over-Year Change in Total COA Requests
By state in New England, 2018-2020



■ Sources: 2017–2020 U.S. Postal Service change of address requests, 2020 HUD Aggregated USPS Administrative Data on Address Vacancies ■ Note: Excludes COA requests from post-office-box and large-volume customer Zip codes, and Zip codes where 50 percent or more of addresses are business addresses.



In Massachusetts and throughout New England more broadly, migration plays an important role in population growth.

accounted for most, if not all, of the population growth. With the pandemic largely halting international migration in 2020, any changes in domestic migration became more important for Massachusetts and the region. COA requests serve as this measure of domestic net migration,⁶ although they tend to undercount the total number of people who relocate, mainly because not everyone who moves files a COA request. Also, COA requests can be made by individuals or families; thus, they relate more closely to the number of households, rather than individuals, that move.

Based on COA requests, every New England state except for Massachusetts lost fewer households through net out-migration in 2020 compared with previous years, or they gained residents through net in-migration for the first time since at least 2017. Table 1 shows net migration for each New England state, as measured by COA requests and depending on whether a request was for permanent or temporary relocation.⁷ Overall, household net migration in Massachusetts and New England was negative each year from 2017 through 2019, meaning the region experienced net out-migration; that is, more households left than entered the region. In 2020, net out-migration fell sharply, with almost 50,000 fewer households leaving the region compared with 2019. In Massachusetts, however, nearly 7,000

Table 1. Net Requests by COA Request Type
By state in New England, 2017 – 2020

State	Request Type	2017*	2018	2019	2020
CT	All	-10,209	-22,308	-18,664	5,426
	Permanent	-13,520	-21,946	-18,459	-1,087
	Temporary	3,398	-306	-152	6,051
ME	All	-5,348	-9,907	-7,122	4,545
	Permanent	-6,969	-8,889	-6,365	888
	Temporary	1,559	-784	-344	3,218
MA	All	-28,457	-56,009	-52,132	-59,043
	Permanent	-30,428	-47,767	-44,664	-46,266
	Temporary	1,829	-8,036	-7,359	-13,608
NH	All	-5,949	-11,751	-8,823	379
	Permanent	-5,204	-8,172	-5,251	1,576
	Temporary	-947	-3,566	-3,329	-1,661
RI	All	-903	-5,461	-2,798	1,589
	Permanent	-2,289	-5,271	-2,763	-5
	Temporary	1,420	-100	-183	1,563
VT	All	-4,891	-10,210	-7,458	-408
	Permanent	-4,908	-8,847	-6,198	-3,027
	Temporary	-210	-1,267	-1,150	2,034
New England	All	-55,757	-115,646	-96,997	-47,512
	Permanent	-63,318	-100,892	-83,700	-47,921
	Temporary	7,049	-14,059	-12,517	-2,403

* 2017 net migration estimates include data for only April through December of that year.

■ Sources: 2017–2020 U.S. Postal Service change of address requests, 2020 HUD Aggregated USPS Administrative Data on Address Vacancies ■ Notes: Net COA requests exclude those from post-office-box and large-volume customer Zip codes, and Zip codes where 50 percent or more of addresses are business addresses. Net permanent-COA and net temporary-COA estimates exclude Zip codes where in- or out-requests were suppressed (<=10 total). For this reason, net permanent- and temporary-COA requests will not sum to all net requests.

more households left the state in 2020 compared with 2019. Massachusetts was the only state in the region to experience more net out-migration in 2020, both for households making permanent relocations and for those making temporary moves.

While the shift toward net in-migration across New England was strongest in 2020, this is not necessarily a recent trend. For all of New England, approximately 18,000 fewer households left the region in 2019 compared with 2018, with both permanent and temporary net out-migration declining.⁸ Massachusetts saw about 4,000 fewer households leave the state during this period. While the pandemic accentuated the prior year's trend in 2020 for the other New England states, that trend toward less out-migration reversed in Massachusetts.

Massachusetts's divergent domestic net migration trend in 2020 was due to differences in the types of moves that households made. The state differed in two key ways from the rest of region. First, the number of households making permanent moves into the state declined

relative to 2019, while the number making permanent moves out of the state remained essentially unchanged. Only about 400 more households made permanent COA out-requests in Massachusetts in 2020 compared with 2019. Meanwhile, the number of households that made permanent COA in-requests decreased by 1,166. This is the opposite of what the rest of New England experienced: In 2020, total permanent COA out-requests declined by more than 28,000 in the region, excluding Massachusetts, and permanent COA in-requests increased by about 9,000. Thus, Massachusetts did not benefit from the decline in permanent

out-requests that the rest of the region experienced, nor did it experience an influx of new permanent residents.

The second reason for the differing trend in Massachusetts involves temporary COA out-requests. In 2020, far more households made temporary moves in general compared with previous years, as they could "try out" living and working in locations where they previously could not.⁹ From 2019 to 2020, temporary COA out-requests in Massachusetts increased by 24,000—more than the increase of nearly 18,000 in temporary COA in-requests in the state during this same period. In the rest of New England, however,



Massachusetts was the only state in the region to experience more net out-migration in 2020, both for households making permanent relocations and for those making temporary moves.

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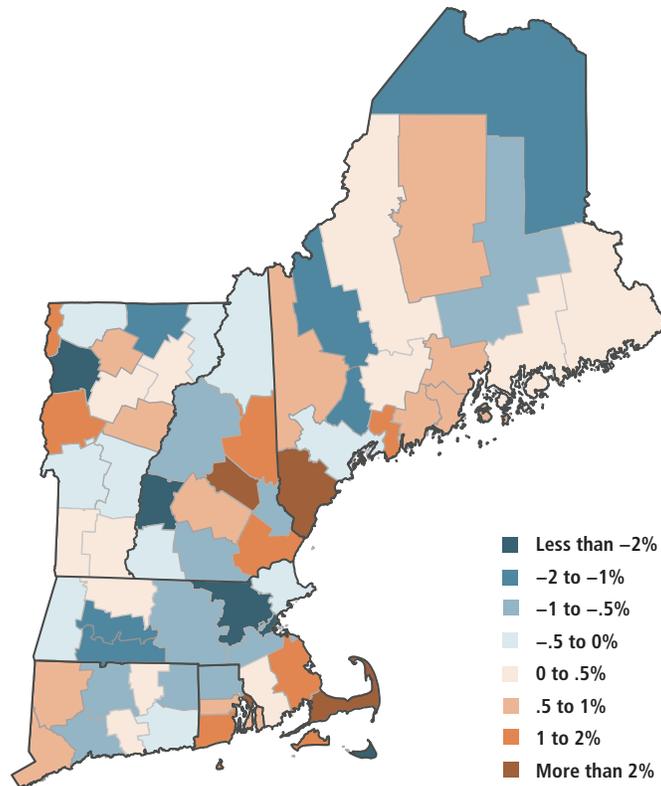


temporary in-requests increased more than temporary out-requests. Therefore, while Massachusetts saw greater permanent out-migration in 2020, it also experienced an increase in temporary out-migration. This contrasts with the other New England states, which overall saw less permanent out-migration and more temporary in-migration. Given that 72 percent of the increase in temporary out-requests for New England were made in Massachusetts but only 40 percent of the new temporary in-requests were made in the state, it is likely that many of the residents who left the Commonwealth relocated, at least temporarily, to other parts of New England.

Local population growth often creates a need for new investment in schools and infrastructure to accommodate new residents. Yet, identifying which communities can expect population changes to persist or become permanent is difficult, especially when the changes are brought about by a shock such as the COVID-19 pandemic. Places with permanent net in-migration offer the best estimate of where potentially persistent changes in population occur because households making permanent COA requests have no explicit timeline for returning to their original residence.

Figure 2 shows permanent net migration in 2020 for each county in New England as a share of total households living in that county in 2019. Thirty-six counties in the region gained households through permanent net migration in 2020 compared with only 10 counties in 2019 and just five in 2018. In Massachusetts, five counties gained households in 2020 compared with two in 2019 (i.e., Barnstable and Plymouth Counties) and just one in 2018 (i.e., Plymouth County). Generally, if a county had positive permanent net migration in 2020, it also tended to have positive temporary net migration. Of the 36 New England counties that added households through permanent net migration in 2020, 26 also added households through temporary net migration. Overall, these

Figure 2. Permanent Net Migration as a Share of Total Households
By county in New England, 2020



■ Sources: 2020 U.S. Postal Service change of address requests, 2020 HUD Aggregated USPS Administrative Data on Address Vacancies, 2019 American Community Survey ■ Notes: Excludes COA requests from post-office-box and large-volume customer Zip codes, and Zip codes where 50 percent or more of addresses are business addresses. Net migration estimates also exclude Zip codes where in- or out-requests were suppressed (<=10 total).

counties gained a mix of both permanent and temporary new residents. Six New England counties added households solely through temporary net migration, including Berkshire and Nantucket Counties in Massachusetts.¹⁰

The effect of permanent net migration on population growth was small. In 2020, counties generally saw a gain or loss of less than 1 percent of their households from either permanent net out-migration or permanent net in-migration. Counties that did lose households in 2020 through permanent net migration generally lost fewer than they did in 2019. Among the 31 counties

with negative permanent net migration in 2020, 26 had declining permanent net out-migration, losing an average of 0.76 percent of households in 2020 compared with 1.6 percent in 2019. Only five New England counties lost more households to permanent net migration in 2020 than in 2019, and three of these were in Massachusetts. Suffolk County went from losing 6 percent of its households to permanent net out-migration in 2019 to 9 percent in 2020; Middlesex County went from losing two percent in 2019 to 3 percent in 2020; and Norfolk County went from losing 0.3 percent to 0.5 percent.¹¹ However, this does not



Households may have been attracted to less densely populated areas because of the extra space they afford, especially given the need to work from home during the pandemic.

necessarily mean that these counties lost population during either period, since COA requests do not track every move made within the United States and do not capture all sources of population change.

Although some counties in Massachusetts lost households in 2020 or previous years through permanent net out-migration, this does not mean every community within these counties lost residents. As Figure 3 shows, in many counties that lost residents overall, the declines in those counties' larger cities accounted for those losses. The characteristics of individual communities likely influenced whether they gained or lost residents during 2020 due to domestic migration. For example, Massachusetts's many college towns have been particularly susceptible to out-migration during the pandemic, as many out-of-state students return home.

The lack of students living in Greater Boston in 2020 did cause a spike in rental vacancy rates and a softening of the rental market in the area,¹² but the effect, if any, that student-led migration had on net migration in Massachusetts in 2020 is difficult to discern. Total net out-migration in 2020 (including both permanent and temporary moves) amounted to an 8.6 percent decrease in the number of households in Massachusetts communities where at least 10 percent of the population was enrolled in undergraduate studies and only a 1.6 percent decrease in communities where less than 10 percent was enrolled.¹⁵ However, many Massachusetts colleges and universities are located in densely populated areas that were early hot spots for virus transmission, so they may have been more likely to have seen out-migration during the initial phases of the pandemic. Higher density areas lost residents to net out-migration, and less dense areas gained residents regardless of the size of their student population. Among Massachusetts communities where at least 10 percent of the population was enrolled in undergraduate studies, those with more than 1,000 people per square mile lost an average of 11 percent of households to total net out-migration in 2020; those with 500 to 1,000 people per square mile lost an average of 1.5 percent of households; and those with fewer than 500 people per square mile gained an average of 3.2 percent in 2020.

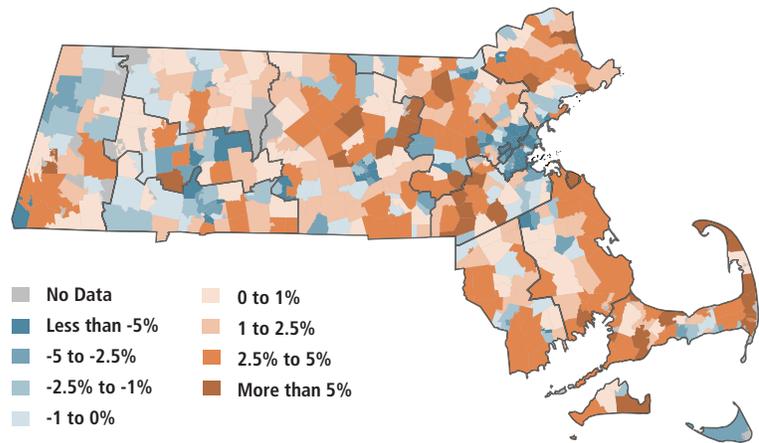
Households may have been attracted to less densely populated areas because of the extra space they afford, especially given the need to work from home during the pandemic. As illustrated in Figure 3, the geographic trend of migration in Massachusetts in 2020 was one of suburbanization—the migration of households to smaller communities but ones still linked to urban areas. This is also evident in Figure 4, which shows permanent net migration rates for both urban and rural areas from 2018 through 2020. Figure 4 also distinguishes between high-commuting rural areas, where more than 30 percent of workers commute to an urban area for work, and low-commuting areas, where less than 30 percent commute.

In 2020, permanent net migration generally resulted in a move out of urban areas and into rural communities. Urban

areas across every New England state lost households, ranging from a 0.2 percent decline in Connecticut to a 2.8 percent decline in Vermont. Rural communities generally added households. In Massachusetts, high-commuting rural communities, which are more akin to suburbs than to the countryside, saw a 1.7 percent increase in the number of households. While low-commuting rural areas in other New England states also gained residents, Massachusetts was the only state where these communities lost households in 2020.

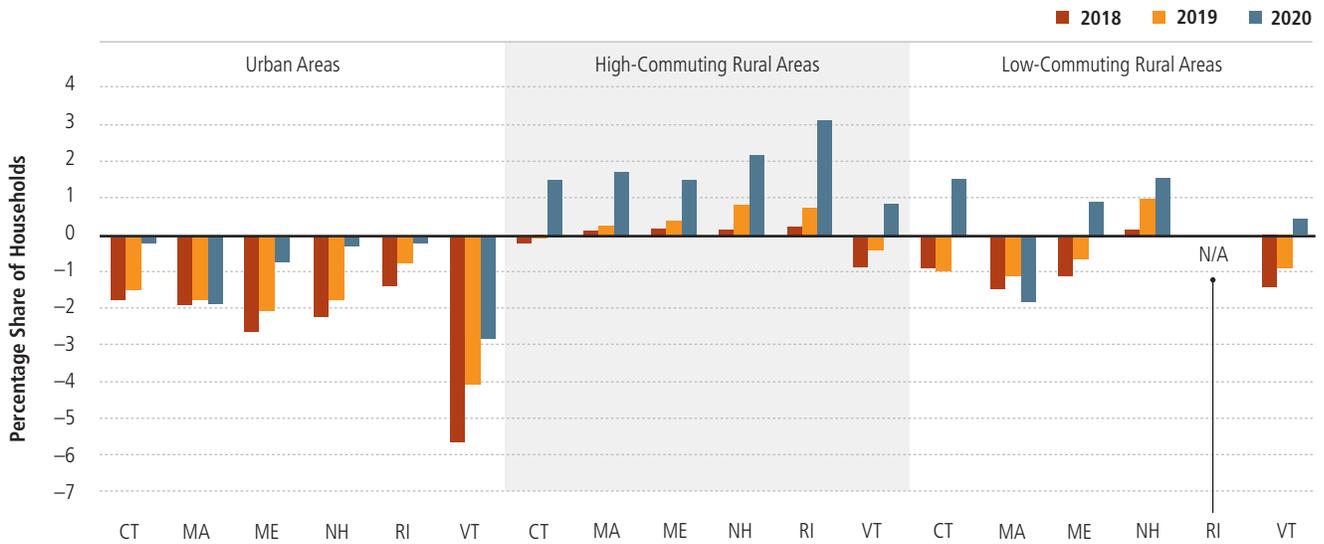
Again, to the extent that the pandemic shifted migration patterns in New England, it did so by accentuating trends that were already in place. From 2018 to 2019, permanent out-migration in most urban and rural areas decreased. For high-commuting rural areas in the region, the permanent net migration rates increased 1.4 percentage points from 2019 to 2020, more than four times the 0.3 percentage-point increase from 2018 to 2019. For low-commuting rural

Figure 3. Permanent Net Migration as a Share of Total Households
By ZCTA in Massachusetts, 2020



■ Sources: 2020 U.S. Postal Service change of address requests, 2020 HUD Aggregated USPS Administrative Data on Address Vacancies, 2019 American Community Survey ■ Notes: USPS Zip codes were converted to U.S. Census ZCTAs in order estimate net migration relative to total households. Excludes COA requests from post-office-box and large-volume customer Zip codes, and Zip codes where 50 percent or more of addresses are business addresses. Net migration estimates also exclude Zip codes where in- or out-requests were suppressed (≤ 10 total).

Figure 4: Permanent Net Migration in Urban and Rural Areas
By state in New England, 2018 – 2020



■ Sources: 2018–2020 U.S. Postal Service change-of-address requests, 2020 HUD Aggregated USPS Administrative Data on Address Vacancies, 2019 American Community Survey ■ Note: Excludes COA requests from post-office-box and large-volume customer Zip codes, and Zip codes where 50 percent or more of addresses are business addresses. USPS Zip codes were classified as urban or rural based on USDA RUCA codes. USPS Zip codes were then converted to U.S. Census ZCTAs in order estimate net migration relative to total households. Low-commuting rural areas in Rhode Island were excluded because the classification pertains to only one ZCTA encompassing Block Island.



Suburban communities, those where many of the residents commute to urban areas for work, continue to grow.

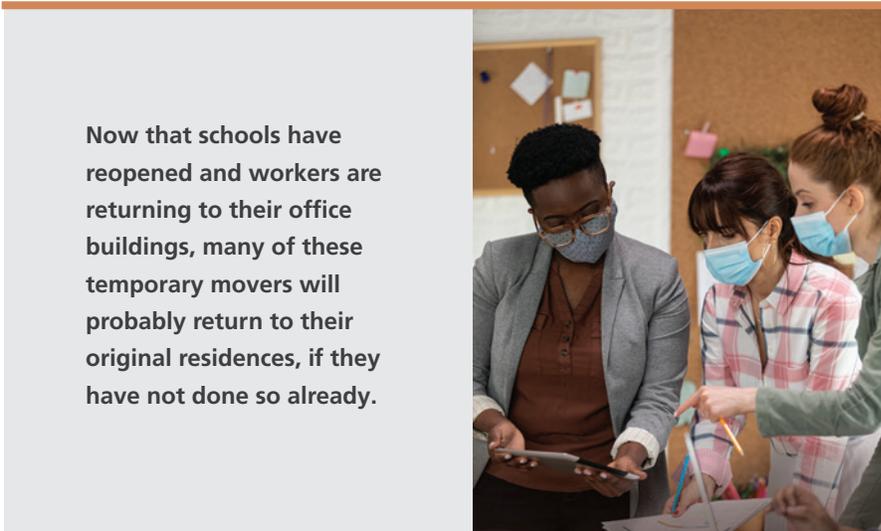
areas, the increase was almost twice as large. Yet, once again, Massachusetts bucked many of these trends, as it was the only state where permanent out-migration in urban and low-commuting rural areas increased from 2019 to 2020. Suburban communities, those where many of the residents commute to urban areas for work, continued to grow.

How then should community leaders in Massachusetts and New England think about the domestic migration trends that occurred in 2020, and can they expect the effects of pandemic-led migration to persist? As noted, the actual population increases that occurred in the region were likely small, as the number of households generally grew by less than 1 percent in the New England counties that added households. Outside of Massachusetts, in the rest of New England, the increase in temporary in-migration in 2020 played an important role. In Massachusetts, the increase in net out-migration in 2020 was largely due to more temporary moves out of the state. Now that schools have reopened and workers are returning to their office buildings, many of these temporary movers will probably return to their original residences, if they have not done so already. This is potentially good news for Massachusetts, indicating that

it is less likely that the increase of net out-migration in 2020 will persist into the coming years. For the rest of the region, it means that many new residents are less likely to remain where they are. The decline in permanent out-migration in the New England states, except for Massachusetts, also indicates that many households may have put off moving in 2020 and so could decide to do so later, resulting in greater out-migration in the coming years.

While new residents bring benefits to their communities, they also can

create needs. Local businesses benefit from greater demand for goods and services, and municipalities can benefit from an expanded property tax base. State leaders should be cognizant of where permanent net migration increased the most in their state, as these are likely the places that will see longer-lasting population growth. However, new residents also bring the need for more housing, new classrooms to accommodate expanding public school enrollment, and new infrastructure investment. No sector



Now that schools have reopened and workers are returning to their office buildings, many of these temporary movers will probably return to their original residences, if they have not done so already.

of the economy reflects this more than the housing market, where the added demand for housing in many New England communities due to an influx of new residents is one factor behind the region's 14 percent increase in the purchase price for new homes from 2020 to 2021—more than twice the increase of 6 percent from 2019 to 2020.¹⁴ At the same time, the out-migration that occurred in places such as Boston provided a financial break for renters who have experienced years of successive rent increases. From 2019 to 2020, the rental vacancy rate declined in every New England state except Connecticut and Massachusetts.¹⁵ Responding to the housing needs of new residents takes time, and without sufficient new construction, residents are likely to be priced out of communities that were once affordable to them, which could lead to greater out-migration in the future.



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This article derives from a 2021 Federal Reserve Bank of Boston New England Public Policy Center (www.bostonfed.org/neppc) Regional Brief titled "How the COVID-19 Pandemic Changed Household Migration in New England."

Endnotes

1) Whitaker, S. D. (2021). *Did the COVID-19 pandemic cause an urban exodus?* (District Data Brief). Federal Reserve Bank of Cleveland. <https://www.clevelandfed.org/newsroom-and-events/publications/cfed-district-data-briefs/cfddb-20210205-did-the-covid-19-pandemic-cause-an-urban-exodus>



State leaders should be cognizant of where permanent net migration increased the most in their state, as these are likely the places that will see longer-lasting population growth.

2) Chiumenti, N. (2021). *How the COVID-19 pandemic changed household migration in New England* (Regional Brief). Federal Reserve Bank of Boston, New England Public Policy Center. <https://www.bostonfed.org/publications/new-england-public-policy-center-regional-briefs/2021/how-the-covid-19-pandemic-changed-household-migration-in-new-england>

3) *Net migration* is the difference between the number of COA requests out of an area and the number into an area. *Net in-migration* refers to positive net migration, and net out-migration refers to negative net migration.

4) In Massachusetts, there were 3 percent more COA requests made in 2020 compared with 2019, and 1.6 percent more made in 2020 compared with 2018.

5) U.S. Census Bureau. (2020). *Annual resident population estimates and estimated components of resident population change: April 1, 2010 to July 1, 2019–March 2020*. <https://www.census.gov/data/tables/time-series/demo/popest/2010s-total-metro-and-micro-statistical-areas.html>

6) From 2017 to 2019, domestic net migration, based on USPS COA requests, followed the same directional pattern (i.e., declining and rising in tandem) year to year as domestic net migration estimates from the U.S. Census Bureau. Among New England states, COA requests generally undercount in-migration and so more likely result in estimates of negative net migration overall.

7) Temporary COA requests last from 15 days to 1 year, after which mail is sent to the original address. Permanent COA requests last an indefinite period.

8) *Permanent net migration* refers to the net migration occurring from permanent COA requests as opposed to *temporary net migration*, which occurs from temporary COA requests. The trends in Table 1 remain after controlling for the number of households in each year; thus, the decline is not due to a change in the total number of households living in New England or each state.

9) As a share of total COA requests made in New England, temporary COA requests increased from 11 percent in 2019 to 14 percent in 2020.

10) In Berkshire County, Massachusetts, the number of households increased by 2 percent from temporary net in-migration in 2020, and in Nantucket County, Massachusetts, the number of households increased by 13 percent. The other four counties that added households solely through temporary in-migration were New Haven County in Connecticut, Cumberland County in Maine, and Rutland and Windsor Counties in Vermont.

11) The other two counties were Androscoggin County in Maine and Essex County in Vermont. For these counties, the share of households that were lost increased by less than half a percentage point.

12) Bernstein, C., Clark, C., Dinnie, I., Hopper, T., Melnik, M., Raisz, A., & Zeigler, C. (2021). *The Greater Boston Housing Report Card 2021*. The Boston Foundation. https://www.tbf.org/-/media/tbf/reports-and-covers/2021/gbhrc2021_final.pdf

13) Includes zip codes assigned to post office boxes and large distributors to account for COA requests made by colleges and universities. USPS zip codes were converted to U.S. Census ZCTAs to estimate the number of households and college student population at the local level. Zip codes were converted to ZCTAs a crosswalk available at <https://udsmapper.org/zip-code-to-zcta-crosswalk/>.

14) Federal Housing Finance Agency. (2021). *Purchase-Only House Price Index*. April 2021. <https://www.fhfa.gov/DataTools/Downloads/Pages/House-Price-Index.aspx> (The estimates compare the first quarters [January through March] of 2019, 2020, and 2021.)

15) U.S. Census Bureau. (2021). *Housing vacancy survey: Rental vacancy rates by state (2007–2020)*. <https://www.census.gov/housing/hvs/data/ann20ind.html>

ARE WE IN A BUBBLE?

Understanding House Price Trends in Massachusetts during COVID-19

KEREN HORN & CHARLOTTE BURLINGAME





The current spike in housing values across Massachusetts does not seem to signal a housing bubble, although it does create concerns. Housing prices in Massachusetts continue to be unaffordable for most residents and have the potential to drive both businesses and households to leave the state, with damaging implications for the Commonwealth's economy. To address the housing affordability issues, there must be a greater focus on significantly increasing housing supply across the state.

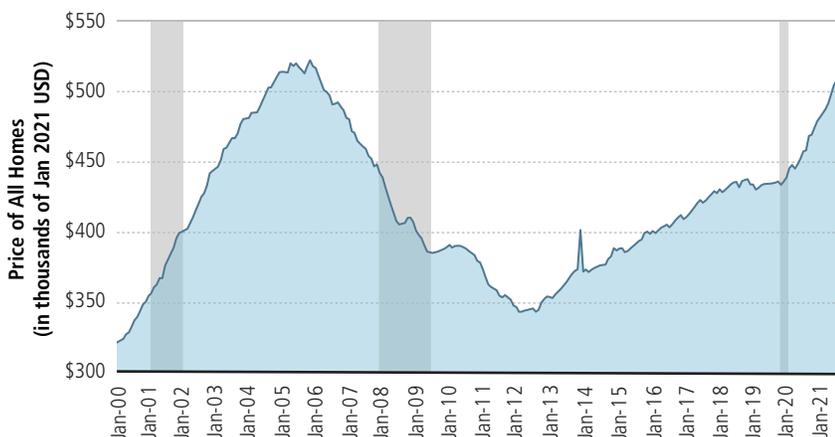




Introduction

On March 10, 2020, Governor Charlie Baker declared a state of emergency in Massachusetts as COVID-19 cases began to spike. In the days, weeks, and months that followed, as cases continued to rise and many people lost their lives, many also lost their livelihoods. Statewide unemployment rose from 2.7 percent in March 2020, to 16.4 percent in April 2020. Since then, conditions in the state have improved, with the unemployment rate down to 3.9 percent as of December 2021. We would expect this type of economic upheaval to be tied to declines in house prices as well—or at least to a “cooling” of the housing market. However, during this recession, house prices in Massachusetts continued to rise at a rate faster than the pre-COVID-19 rate. Figure 1 shows that in 2019 (i.e., the year prior to the pandemic hitting Massachusetts), house prices in the state were relatively flat and that in 2020 through 2021, and house prices rose across the state at a faster rate than experienced for most of the decade.

Figure 1. Price of All Homes in Massachusetts
Jan 2000 – Nov 2021



■ Source: House price data from Zillow’s Home Value Index. ■ Note: The trend of average all home price in Massachusetts from January 2000 to November 2021. Prices are adjusted for inflation and measured in real January 2021 U.S. dollars. Vertical shading indicates a recession (recession data from Federal Reserve Economic Data).

These trends have raised concerns about a “house price bubble.” In this article, we examine trends in house prices during this unprecedented time and present some theories as to why prices have continued to rise during the current recession. We argue that these price trends were driven by shifting market fundamentals—particularly a lack of adequate housing supply and a growing demand for more housing—and were not a result of speculation. For these reasons, we believe that Massachusetts is not experiencing a bubble and that to address the housing affordability issues currently facing the state, there must be a greater focus on significantly increasing housing supply across the Commonwealth.



Defining a House Price Bubble

According to Case and Shiller’s (2003) widely cited definition, a *house price bubble* refers to “a situation in which excessive public expectations of future price increases cause prices to be temporarily elevated.”²¹ They argued that one element of a house price bubble is a rapid rise in prices (which Massachusetts experienced from 2020 through 2021) but that this rapid rise must be driven, at least in part, by expectations of large future price increases (i.e., speculation) and not justified entirely by market fundamentals. Case and Shiller described the increase in house prices in the 1980s and decline in the early 1990s in cities across the globe, including Boston, Los Angeles, London, Sydney, and Tokyo, as one of the earliest documented examples of a house price bubble. In 1985, in the Boston metropolitan area, house prices increased by 39 percent in one year and by over 140 percent by 1988, when prices began to fall. Prior to the crash of the housing market, believed by many to have been a “housing bubble,”^{22,3} house prices had increased by 60 percent from 2000 to 2005. More recently, Massachusetts has experienced a 10 percent increase in house prices in the past year and a 20 percent increase in the past 5 years, a small fraction of the changes observed in the bubble of the late 1980s or the bubble that preceded the Great Recession. This context is important to consider when evaluating current house price trends in the Commonwealth, which we discuss in the next section.

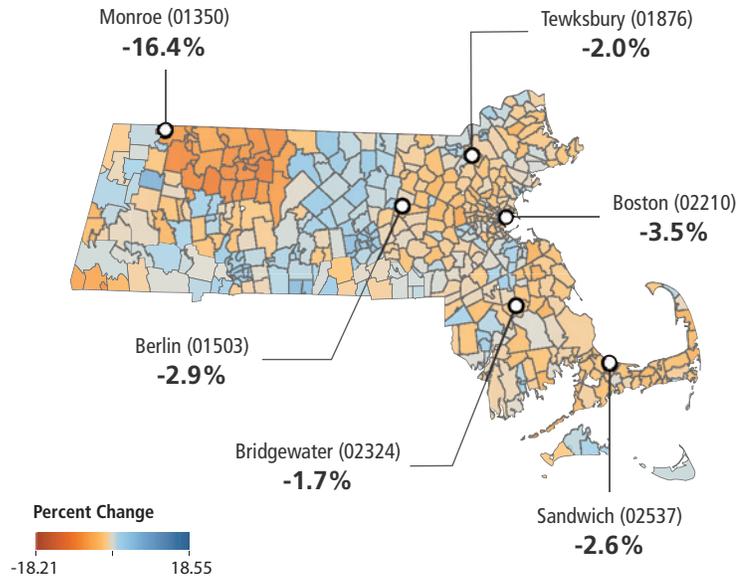


Changes in House Prices Across the State

In 2019, trends in house prices were variable across the state, with central Massachusetts experiencing the largest house price increases. Figure 2 illustrates the percentage change in house prices at the zip-code level from January 2019 through January 2020. Many parts of the state, particularly northwestern Massachusetts, experienced declines in housing values during this time. For example, the town of Monroe saw a 16.4 percent decline in housing values from January 2019 through January 2020. The south shore area and many zip codes in Cape Cod also experienced decreasing house prices. Moving forward a year to 2020, an almost universal rise in house prices occurred across the state. Figure 3 depicts the percentage change in house prices from January 2020 through January 2021. During this period, Monroe township experienced an 11.7 percent increase in housing values, and Cape Cod zip codes experienced some of the greatest increases in house prices. For example, the town of Sandwich had a 15.4 percentage-point increase in home prices from January 2019 through January 2021.

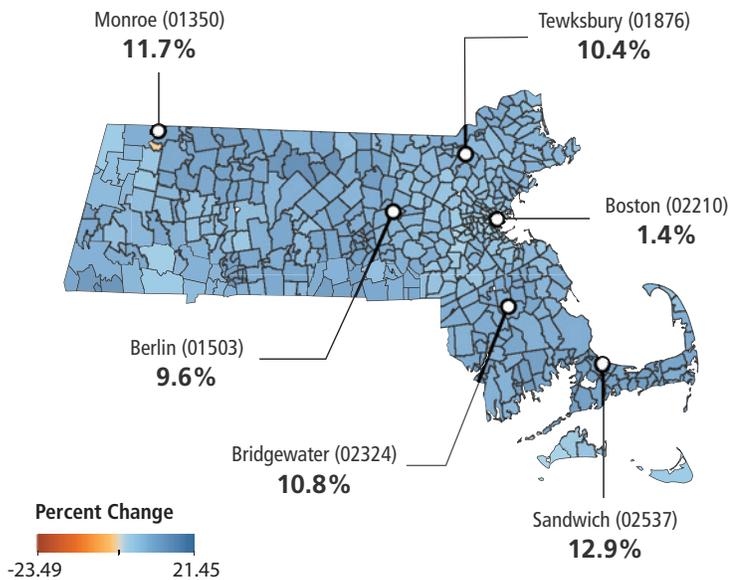
This stark reversal in house price trends occurred during a time of incredible financial hardship for many people across Massachusetts. These trends therefore beg the question: Is the state currently in a housing bubble? Our analysis suggests that these trends represent a response to market conditions and are not driven by speculation or by expected future increases. Specifically, during this period, demand for homes remained strong, and corresponding supply was significantly constrained.

Figure 2. Percent Change Housing Prices (All Homes)
Jan 2019 – Jan 2020



■ Source: House price data from Zillow's Home Value Index. ■ Note: Map shows the percent change in house prices (all homes) by zip code from January 2019 to January 2020 in inflation-adjusted January 2021 USD.

Figure 3. Percent Change Housing Prices (All Homes)
Jan 2020 - Jan 2021



■ Source: House price data from Zillow's Home Value Index. ■ Note: Map shows the percent change in house prices (all homes) by zip code from January 2020 to January 2021 in inflation-adjusted January 2021 USD.



Data

To better understand whether current house price changes represent a housing bubble, we relied on several publicly provided datasets, including information on housing values, rental rates, household incomes, housing inventory, and new housing supply.

We used datasets provided by Zillow.⁴ For all homes, we utilized the Zillow Home Value Index, which includes single-family residences as well as condos and coops, at both the state and zip-code levels. These data measure the typical home value in an area based on recent housing sales. We also used the Zillow Observed Rent Index at the metropolitan and zip-code levels to examine trends in rental values from 2014 to 2021. To measure the supply of housing for sale, we relied on Zillow's For-Sale Inventory dataset, which

includes a count of unique listings active at any time in a given month. These data are available at the metropolitan level but not the zip-code level.

We also looked at building patterns using data from MassBuilds,⁵ an inventory of past, present, and future real-estate development projects created by the Metropolitan Area Planning Council. These data provide critical information on new supply being created in Massachusetts.

Additionally, we utilized income data from the U.S. Census Bureau's Current Population Survey⁶ and calculated annual income using weekly earnings estimates. We constructed a price-to-income ratio, a ratio of average house prices to median yearly income in Massachusetts, to explore the relationship between house prices and incomes, one indicator of a potential housing bubble.





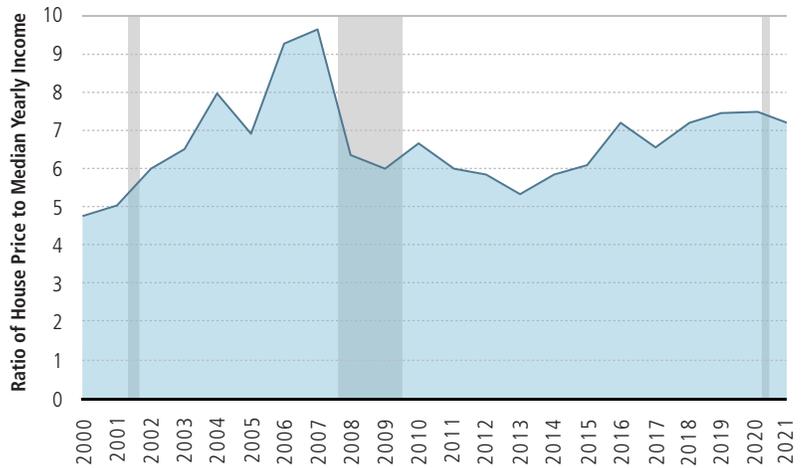
Is There a Bubble?

Price-to-Income Ratio

In their recent work on house price bubbles, Kholodilin et al. (2018) argued that a house price bubble and increasingly speculative behavior can be observed in macroeconomic variables such as price-to-income and price-to-rent ratios.⁷ These ratios would be expected to rise in the case of a house price bubble. Figure 4 presents the mean house price to median yearly income ratio for Massachusetts from 2000 to 2021. The ratio increased steeply until 2008, then dropped and remained relatively constant until present day. This trend presents some descriptive evidence that the most recent house price changes are being “matched” by increases in household income at the state level. If there were a housing bubble or speculative behavior similar to the trends that preceded the Great Recession, one might expect to see a steep increase in the price-to-income ratio. However, despite the large increase in house prices during the pandemic, this ratio does not seem to be increasing.

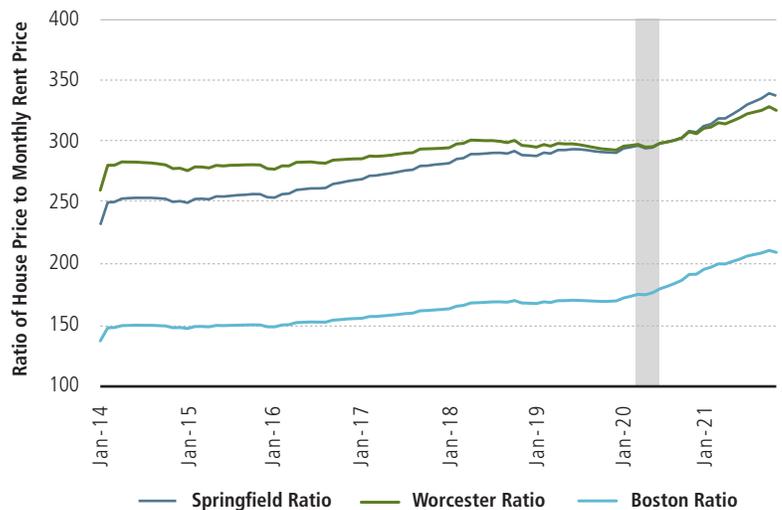
Figure 5 presents the mean house price-to-rent ratios in Boston, Springfield, and Worcester from 2014 to 2021. In this case, it does appear that house prices increased much more rapidly than rents during the pandemic, which is a potential sign of increased speculation that occurs during a housing bubble. However, given the immediate need for households to quarantine—which led many college students and young adults to move back in with their families—this decline in demand for rental housing seems to be driving this trend rather than increased speculation. As businesses and services have reopened and demand for rental units has recovered, rents have started to increase again, and it appears that this ratio may be stabilizing, providing additional support that these trends are not indicative of a housing bubble.

Figure 4. House Price to Median Yearly Income in Massachusetts 2000 – 2021



■ Source: House prices data from Zillow’s Home Value Index. Income data from IPUMS Current Population Survey.
 ■ Note: The ratio of typical house prices (all homes) in Massachusetts to median yearly income in Massachusetts from 2000 to 2021. Both prices and incomes are in real January 2021 U.S. dollars. Vertical shading indicates a recession (recession data from Federal Reserve Economic Data).

Figure 5. House Price to Monthly Rent Price in Massachusetts Ratio Jan 2014 – Oct 2021



■ Source: House and rent data from Zillow. ■ Note: The trends of the price-to-rent ratios for Boston, Springfield, and Worcester metro areas from 2014 to 2021. Prices are adjusted in real January 2021 U.S. dollars. Vertical shading indicates a recession (recession data from Federal Reserve Economic Data).



Supply of Homes for Sale

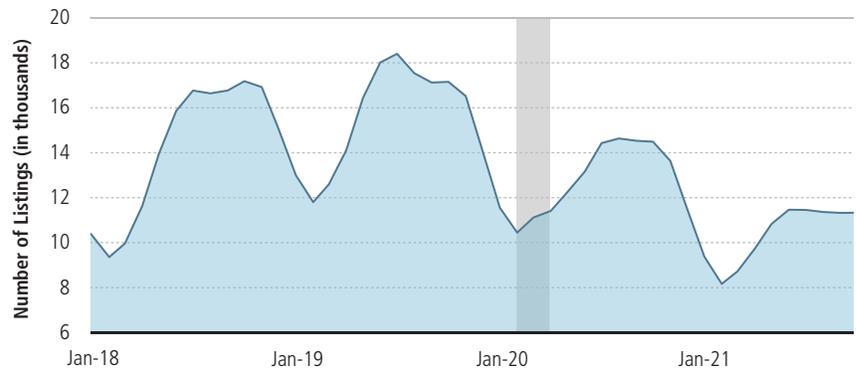
While we did not observe steep increases in price-to-income during this period, we did see steep declines in available housing stock, a fundamental factor in driving changes in housing values. The total number of units listed for sale declined precipitously during this period, and, simultaneously, we did not observe any evidence of a decline in demand for new homes during this time. Figures 6, 7, and 8 show listings for sale in Boston, Worcester, and Springfield between January 2018 and October 2021. In the spring following initial lockdowns driven by COVID-19, listings were down approximately 20 percent in Boston, and supply constraints were even starker in Springfield and Worcester. When examining the market for single-family homes, we found that this supply constraint was even more pronounced.

There are many possible reasons why listings have been so limited, such as a fear of moving during a pandemic or fewer job opportunities in distant locations which would lead households to move. Whether new listings will return to pre-pandemic levels, now that vaccines are widely available and the majority of COVID-19 restrictions have been lifted, is still unclear. However, current data from 2021 are not showing a recovery of supply to pre-pandemic levels; if anything, supply appears to be even more constrained than in 2020.

While measuring demand for housing is challenging, one potential indicator is the average days a house is listed on the market before it is purchased. Nationally, this number declined from 66 to 43 days between December 2019 and December 2020. In the Boston metropolitan area, this number decreased from 48 to 31 during the same period. One possible

Figure 6. Inventory/Sales All Homes Boston Metro Area

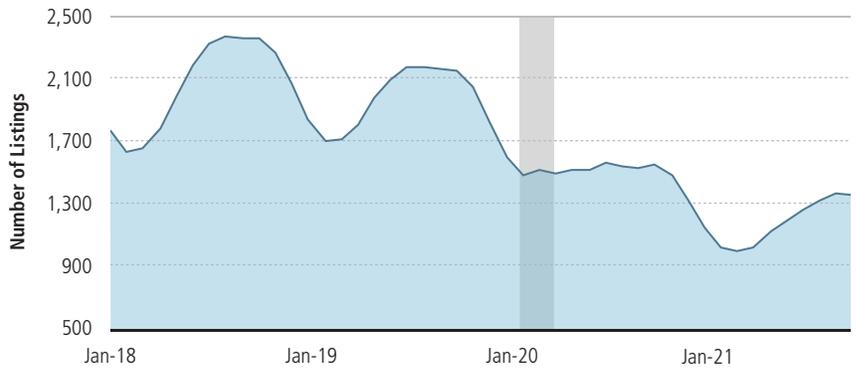
Jan 2018 – Oct 2021



■ Source: Inventory/sales data from Zillow's For-Sale Inventory. ■ Note: The trend of inventory/sales of all homes in Boston, MA, metro area from January 2018 to October 2021. Vertical shading indicates a recession (recession data from Federal Reserve Economic Data).

Figure 7. Inventory/Sales All Homes Springfield Metro Area

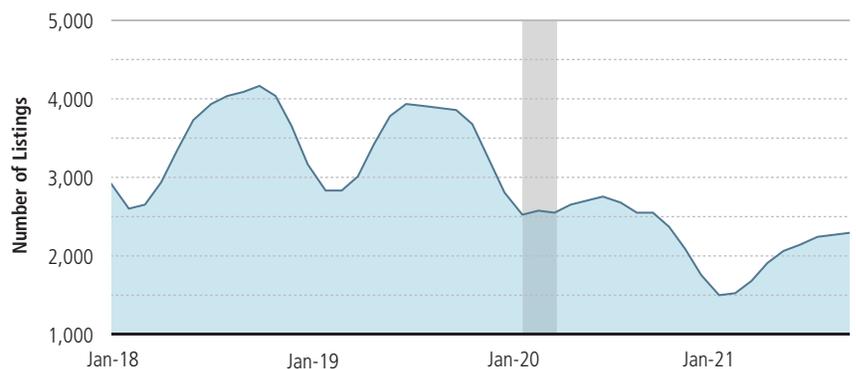
Jan 2018 – Oct 2021



■ Source: Inventory/sales data from Zillow's For-Sale Inventory. ■ Note: The trend of inventory/sales of all homes in Springfield, MA, metro area from January 2018 to October 2021. Vertical shading indicates a recession (recession data come from Federal Reserve Economic Data).

Figure 8. Inventory/Sales All Homes Worcester Metro Area

Jan 2018 – Oct 2021



■ Source: Inventory/sales data from Zillow's For-Sale Inventory. ■ Note: The trend of inventory/sales of all homes in Worcester, MA, metro area from January 2018 to October 2021. Vertical shading indicates a recession (recession data come from Federal Reserve Economic Data).

explanation for this decline in average days on the market is a combination of the decline in listed for-sale homes and an increased demand for private space during the prolonged shuttering of workplaces, schools, and colleges by those who were able to retain employment and who shifted to working from home. When people had to spend most of their time indoors due to initial lockdowns, larger and more private space became more desirable.

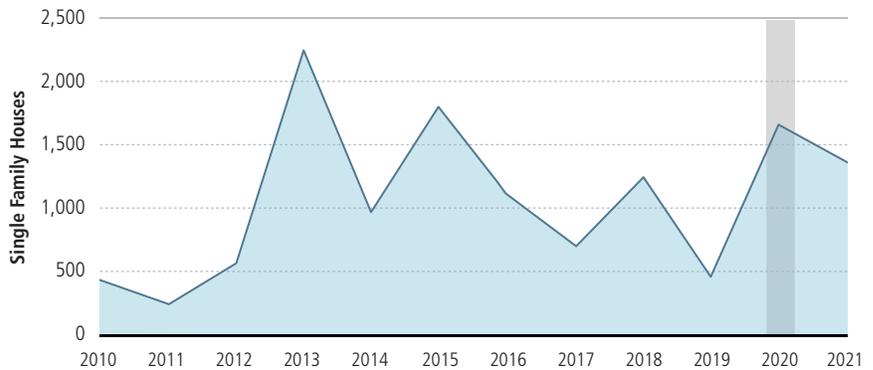


New Construction

Though it remains unclear whether listings for sale will “rebound,” it is clear that Massachusetts is not building enough new housing to keep up with increasing demand. MassBuilds provides information on the total number of units built in the state. We present information on total single-family homes, small multi-family homes, and large multi-family homes built between January 2010 and January 2021. Figure 9 shows that since the start of 2020, construction of single-family homes in Massachusetts has been declining, though demand for this type of housing stock has been increasing. When looking at small multi-family homes (Figure 10), we saw a flattening in the rate of construction but still growth in the number of these types of buildings. In addition, when focusing on large multi-family homes (Figure 11), we found that construction of these building types is increasing more slowly than before the pandemic but still more rapidly than smaller multi-family construction. For the state to continue meeting the demand for housing, construction of each type of housing must increase in the next few years.

Figure 9. Completed Single-Family Houses in Massachusetts

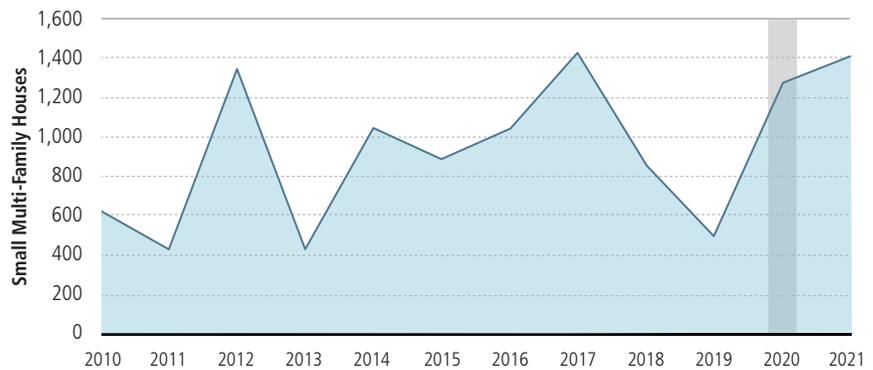
2010 – 2021



■ Source: Construction data from MassBuilds. ■ Note: The trend of total completed single-family houses in Massachusetts from 2010 to 2021. Darker vertical shading indicates a recession (recession data from Federal Reserve Economic Data).

Figure 10. Completed Small Multi-Family Houses in Massachusetts

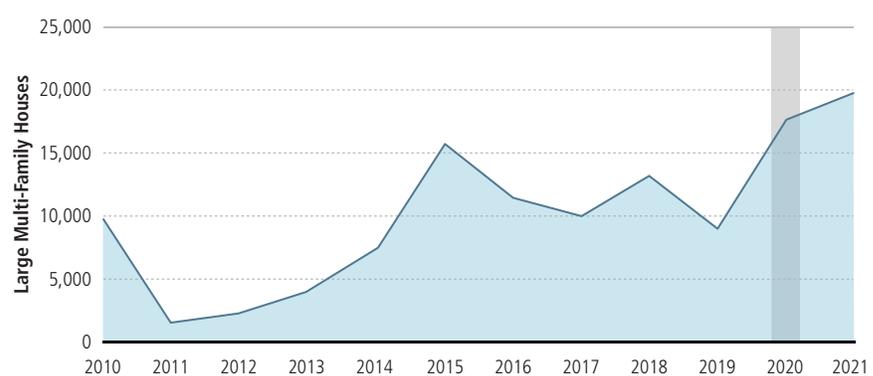
2010 – 2021



■ Source: Construction data from MassBuilds. ■ Note: The trend of total completed small, multi-family houses in Massachusetts from 2010 to 2021. Darker vertical shading indicates a recession (recession data from Federal Reserve Economic Data).

Figure 11. Completed Large Multi-Family Houses in Massachusetts

2010 – 2021



■ Source: Construction data from MassBuilds. ■ Note: The trend of total completed large, multi-family houses in Massachusetts from 2010 to 2021. Darker vertical shading indicates a recession (recession data from Federal Reserve Economic Data).

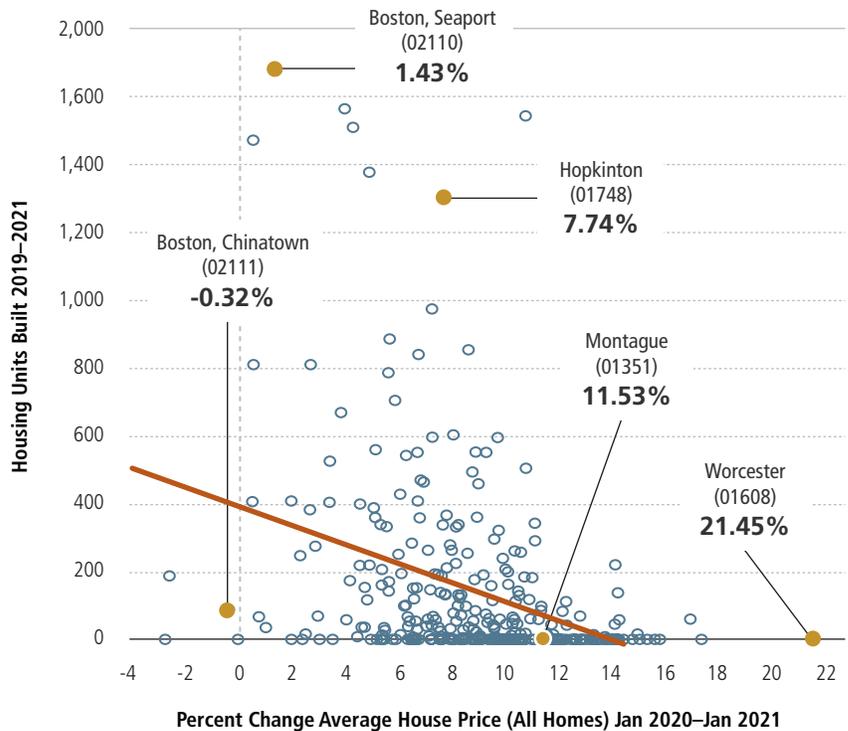
Finally, we examined where new units are built in relation to the increase in prices over the last year to determine if more housing is currently being built in areas with greater increases in housing values. As depicted in Figure 12, we found that the opposite is true: In places with the greatest increase in housing values, very little new housing is being built (with very similar patterns observed in 2019-2020). This suggests a need for not only more housing in Massachusetts, but also a commitment to building more housing in neighborhoods that have been resistant to new construction. In fact, according to MassBuilds data, over 50 percent of towns in Massachusetts have built no new housing between 2010 and 2020. Of the over 100,000 units recorded in these data, 30 percent were in Boston, even though Boston is home to only 10 percent of the total state population. Of the 351 towns and municipalities in the Commonwealth only 20, including Boston, produced more than 1,000 units during this period, and only Boston and Cambridge produced over 5,000 new units.



Conclusion

The current spike in housing values across Massachusetts is concerning, but it does not seem to signal a housing bubble. It does, however, raise concerns. Housing prices continue to be unaffordable for most residents of the state, potentially driving both businesses and households to leave the state, causing long-term damage to the state's economy.

Figure 12. Percent Change in Average House Prices, 2020–2021, and Construction of Housing Units



■ Source: Construction data from MassBuilds. House prices data from Zillow's Home Value Index. ■ Note: Percent change in average house prices for all homes from January 2020 to January 2021 vs. sum of housing units built from 2019-2021 by zip code.



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Endnotes

1) Case, K. E., & Shiller, R. J. (2003). Is there a bubble in the housing market? *Brookings Papers on Economic Activity*, 2003(2), 299–342. <https://www.jstor.org/stable/1209196>

2) Glaeser, E. L., Gottlieb, J. D., & Gyourko, J. (2013). Can cheap credit explain the housing boom? In E. L. Glaeser & T. Sinai (Eds.), *Housing and the financial crisis* (pp. 301–359). University of Chicago Press.

3) Levitin, A. J., & Wachter, S. M. (2012). Explaining the housing bubble. *Georgetown Law Journal*, 100(4), 1177–1125.

4) <https://www.zillow.com/research/data/>

5) <https://www.massbuilds.com/map>

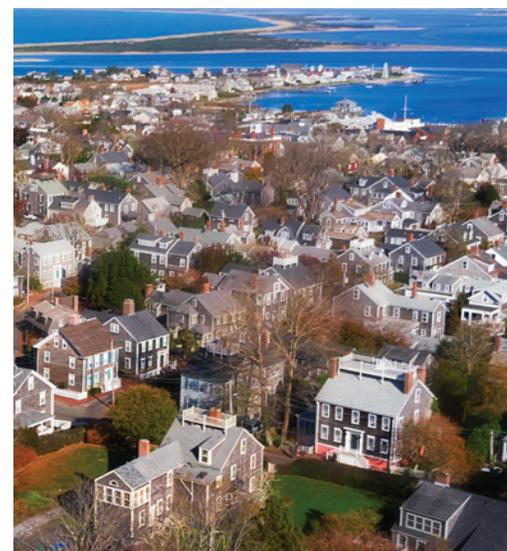
6) <https://cps.ipums.org/cps/>

7) Kholodilin, K. A., Michelsen, C., & Ulbricht, D. (2018). Speculative price bubbles in urban housing markets. *Empirical Economics*, 55(4), 1957–1983. <http://dx.doi.org/10.1007/s00181-017-1347-x>

Three Takeaways from the Massachusetts Census 2020 Count

SUSAN STRATE

This piece compares city- and town-level 2020 population counts to previous census counts as well as the Census Bureau’s own 2020 “evaluation estimates,” and identifies a few standout themes in Massachusetts’s population growth over the last decade.





The last time the 2020 U.S. Census was featured in the Endnotes section of *MassBenchmarks*, the nation was in the midst of a protracted and exceedingly challenging census count. Due to the COVID-19 pandemic and its unfortunate timing relative to a planned April 1, 2020, count, some census operations

were cancelled, some delayed, and others extended only to be curtailed again.¹ At the same time count operations were beset by these disruptions, political arguments tying the census count and congressional reapportionment to immigration status were stirring up fear and hesitation among foreign-born residents. As a state with a very high percentage of immigrant populations, and as college populations evacuated campuses right before the census count, Massachusetts had many reasons to anticipate a population undercount in the 2020 Census.

The apportionment counts released in January 2021 offered a big sigh of relief—and perhaps even surprise—when the Massachusetts count came in 131,801 higher than the official Census Bureau estimates for the same period.² In fact, the Commonwealth's percentage growth of 7.4 percent—on par with the U.S. average for the first time in decades—was the highest in the Northeast, the fastest the state has grown since the 1960s, and twice that of the previous decade. The Census 2020 Redistricting dataset release in August 2021 (also referred to as the “PL-94 data” after the redistricting legislation that requires its release) further illuminated areas of the state that grew the most or least, and which exceeded expectations. In comparing city- and town-level 2020 population counts to previous census counts as well as the Census Bureau's own 2020 “evaluation estimates,” we identify in the following sections a few standout themes in Massachusetts's population growth over the last decade.

1



POPULATION GROWTH WAS STRONGEST ALONG MAJOR COMMUTING ROUTES AND OUTPACED CENSUS ESTIMATES

While not necessarily surprising, it is still striking to see just how closely population growth during the past decade aligned with major transportation routes. As shown in Figures 1 and 2, from 2010 to 2020, cities and towns along major commuting routes—including major highways and commuter rail routes—outpaced their neighboring towns in percent population growth. Perhaps more surprising is the extent to which the growth in these towns also exceeded the Census Bureau's population estimates (Figure 2). These “evaluation estimates” are expected to be fairly accurate; they are based on

the Census 2010 count plus subsequent births and deaths, migration records from the IRS, Medicare, Social Security, and the American Community Survey, and local reporting of housing unit change. Because the census estimates incorporate new housing development throughout the decade, population counts greater than the estimates indicate that persons-per-household and occupancy rates in these communities have also increased significantly over their 2010 levels.

This strong population growth along travel corridors may indicate that increasing housing costs in Boston are pushing workers further out of the urban core, or it may simply reflect that more people want to live in the suburbs. The large population wave of millennials—now between the ages of 25 and 40—is more likely to move to the suburbs as they enter the “family formation years” while still maintaining employment in the Boston area. In addition, with both average commuting time and the number of “super-commuters” increasing steadily year over year, it is not surprising that, if possible, people will move to places that offer the fastest access to their

place of work. Whether the pandemic-driven “work from home” movement mitigates this migration pattern in the future remains to be seen, but it seems more likely that the need for affordable housing coupled with the desire for shorter travel times will continue to promote more concentrated population growth in these communities.

2



GATEWAY CITIES SHOWED VERY STRONG GROWTH AND CAME IN HIGHER THAN EXPECTED

From 2010 to 2020, Massachusetts “gateway cities”³ were among the fastest growing cities in the state in terms of percent population growth, with Revere leading the pack at 20.2 percent, followed by Everett, Lawrence, and Chelsea, all growing by more than

Figure 1. Percent Change in Massachusetts City and Town Populations, Census 2010 to Census 2020

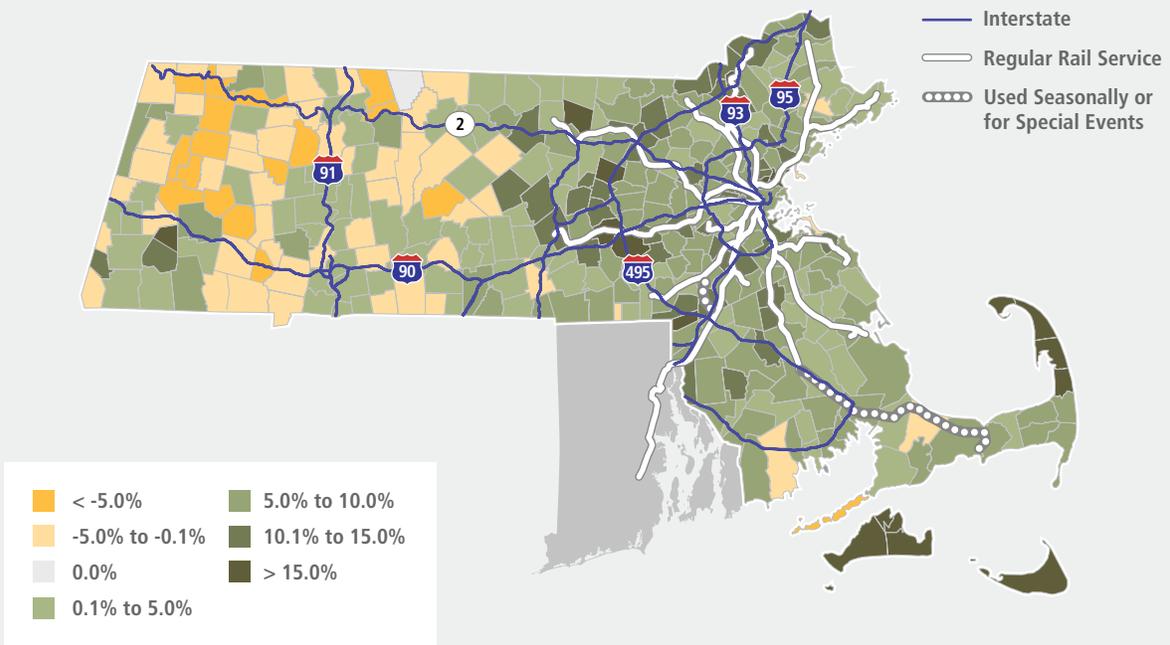
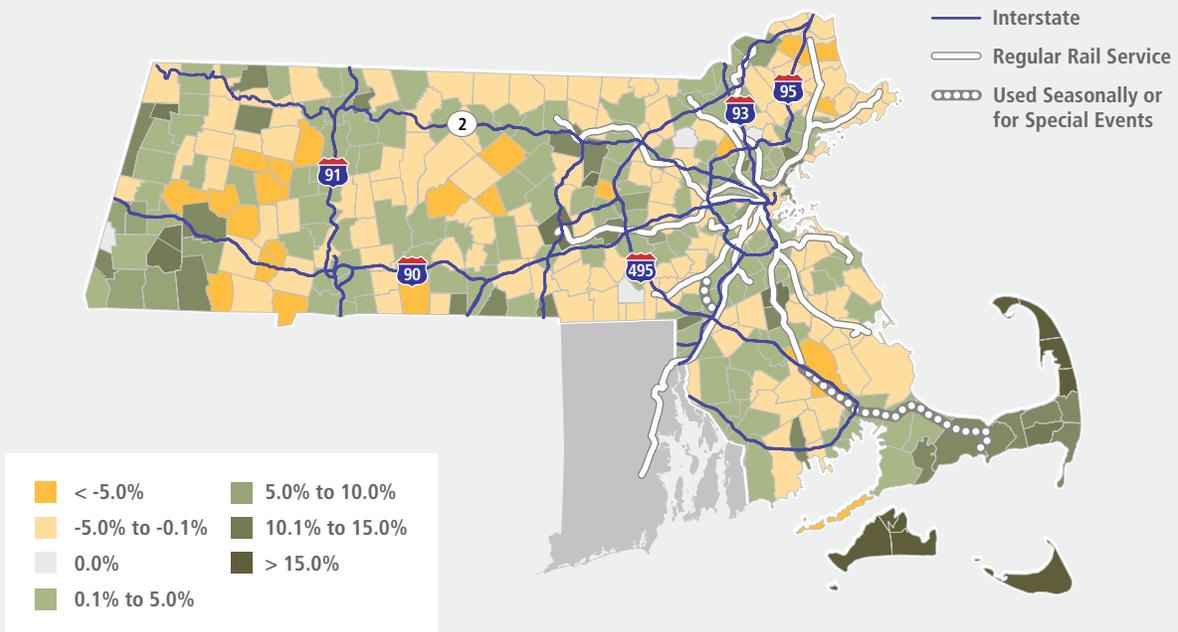


Figure 2. Census 2020 Population Compared to Census 2020 Estimates



15 percent over the course of the last decade—more than twice the state average. In fact, over the past 10 years, some of the gateway cities grew at the fastest rate they have experienced in the last 100 years including Fall River, Lawrence, Lynn, Salem, and Worcester.

Additionally, all but two of Massachusetts's 26 gateway cities had Census 2020 population counts greater than the Census Bureau's April 1, 2020, population estimates. Most notably, Revere came in 9,607 persons, or 18.3 percent, greater than estimated; Worcester 21,664 persons, or 11.7 percent, greater; and Lawrence 9,073, or 11.3 percent, greater than the "evaluation estimates." Given that Lawrence and Revere rank 4th and 5th in the state for percent of foreign-born population, the strong showing amid anti-immigrant rhetoric is even more impressive.

While it is possible that high housing costs in job centers like Boston are driving more people into less expensive cities (as suggested earlier), it is also true that Massachusetts gateway cities' growth reflects a broader trend in population growth around the United States over the past decade. According to the U.S. Census Bureau, metropolitan areas and urban and suburban counties grew much more rapidly than small places (or "micro areas") and rural counties. According to the Bureau, "between 2010 and 2020, the population of U.S. metro areas grew by 9 percent, while the population of U.S. micro areas grew by 1 percent."⁴ In Massachusetts, the 26 gateway cities account for 15 out of the 25 most populous places in Massachusetts, and 25 out of the top 40. Holyoke and Westfield, the only two cities that lost population and came in below the census estimates, are also among the three smallest of the gateway cities, along with Chelsea, in terms of total population.

3



THE CAPE AND ISLANDS AND SOUTHERN BERKSHIRES SHOWED DRAMATIC TURNAROUNDS IN POPULATION GROWTH

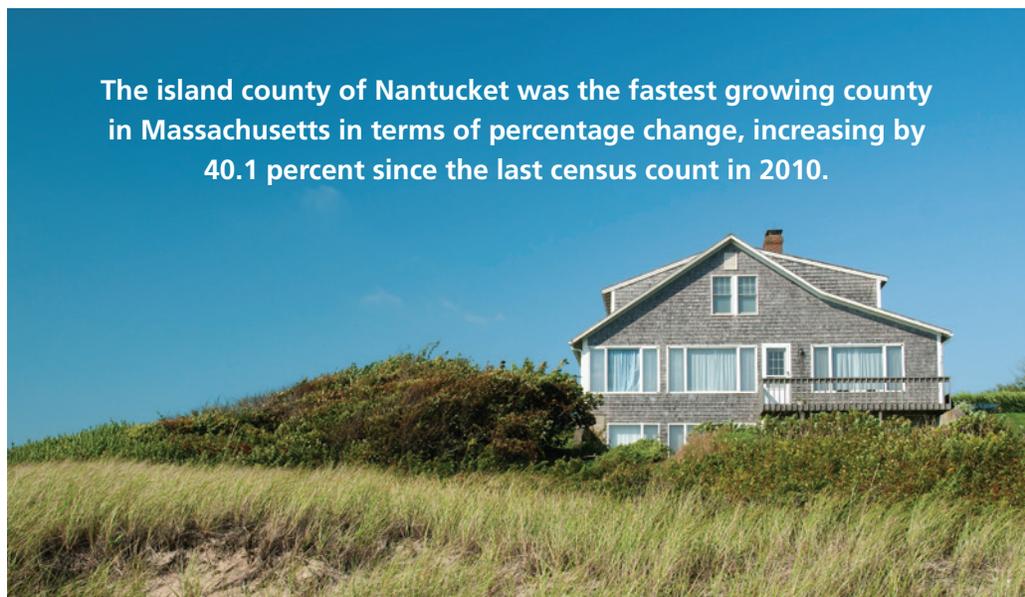
One of the most notable results from the Census 2020 count in Massachusetts may be described as the "Cape Cod comeback"—the dramatic increase in population in the Cape and Islands region of the state. The island county of Nantucket was the fastest growing county in Massachusetts in terms of percentage change, increasing by 40.1 percent since the last census count in 2010. The island county Dukes, which includes Martha's Vineyard, followed right behind in rank, growing by 24.6 percent. Even Barnstable County, commonly referred to as "Cape Cod," moved up in rank from the county with the greatest population loss during the 2000 to 2010 period to

the 9th fastest growing from 2010 to 2020. Though last decade Barnstable decreased by 2.9 percent, this decade it *increased* by 6.1 percent.⁵

Likewise, many towns in the southern Berkshires gained population at an unanticipated pace, including the small towns of Egremont, Monterey, and Tyringham—all increasing by over 10 percent. While not as dramatic as the Cape Cod boom, overall, the Berkshires saw increasing population in 15 of its 32 towns in a county that has been losing population since the 1970s. While the impact of population gain in the southern Berkshires was not enough to reverse the population decline, it certainly slowed the level of loss experienced in previous decades; the county population decreased by just 1.7 percent this decade compared to 2.7 percent in the 2000–2010 period.

With the once-per-decade census count occurring in the midst of a global pandemic, it is reasonable to wonder whether these unexpected gains are simply the result of people "heading for the hills" as a practical response to the spread of the virus. While gateway city gains indicate that these areas were not emptying out to the extent that many feared, the seasonal areas of our state seem to have been significantly

The island county of Nantucket was the fastest growing county in Massachusetts in terms of percentage change, increasing by 40.1 percent since the last census count in 2010.



impacted. Both of these regions showed much stronger growth than what the Census Bureau's estimates had predicted.

There is a real possibility that the usual Cape Cod and Berkshire "snowbirds" came home early from—or stayed away from—their Florida or Arizona getaways and settled in instead as "stay-birds" in the spring of 2020, perhaps in reaction to Massachusetts's COVID-19 protocols versus other states.¹ In addition, census in-field "Update Leave" operations—that is, persons dropping off forms or knocking on doors—which usually occur in March and April, this time started in late May through June, with non-response-follow-up activities running all the way to mid-October. People with homes in multiple states were simply more likely to be enumerated in their summer seasonal homes in the 2020 Census or to choose the address they were in at the moment when the form requested their "most of the time" address.

That said, the census may have also captured a legitimate population shift. As many baby boomers—now aged 57 through 75—retired in droves over the past decade, there is a strong possibility—and plenty of anecdotal evidence—that more seasonal homeowners on the Cape may be making these their primary residences. The housing data in the latest census count show a hefty turnover of housing occupancy from "vacant"—which includes "seasonal" according to census definitions—to "occupied." Between 2010 and 2020, total housing units in the Cape and Islands increased by 5,497, while occupied units increased by 10,426 and vacant units decreased by 4,929.

Whether the changes in the seasonal populations are permanent or temporary—or perhaps more realistically where and to what degree these movements are permanent or temporary—remain to be discovered. Nicholas Chiumenti's article on pandemic migration in this *MassBenchmarks* issue offers great insight into unravelling this question

using U.S. Postal Service change-of-address (COA) data. He found, for example, that Barnstable County had already been gaining new permanent households by 2019, while Berkshire and Nantucket Counties were among the six New England counties in 2020 that "added households solely through temporary net migration," according to COA requests. Meanwhile, demographers and planners alike are holding their breaths to see what happens next and whether the COVID-19 pandemic years will ultimately be treated as outliers, trend-setters for the new normal, or something in between.



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The author would like to acknowledge the significant research contributions to this article by Matthew Schlaikjer, Research Analyst II, and Denis McCauliffe, Research Analyst, of the Population Estimates Program.

Endnotes

1) The 2020 Census "Update Leave" operation—whereby 2020 Census invitations and paper questionnaires were delivered to households in certain, often rural, areas across the United States—was originally scheduled for March–April of 2020, but due to the pandemic, it took place late May through June in Massachusetts. "Non-Response Follow-Up" operations, during which census workers knock on doors of non-responding addresses, were scheduled for mid-May through July 2020 but were moved to mid-July through October 15, 2020. <https://www.census.gov/programs-surveys/decennial-census/decade/2020/planning-management/operational-adjustments.html>

2) July 1, 2020 Subcounty Population Estimates. Source: U.S. Census Bureau, Population Division Release date: July 2021. <https://www.census.gov/programs-surveys/popest/technical-documentation/research/evaluation-estimates/2020-evaluation-estimates/2010s-cities-and-towns-total.html>

3) Designated by the Massachusetts state legislature, "gateway cities" are described as "midsize urban centers that anchor regional economies around the state. For generations, these communities were home to industry that offered residents good jobs and a 'gateway' to the American Dream. Over the past several decades, manufacturing jobs slowly disappeared. Lacking resources and capacity to rebuild and reposition, Gateway Cities have been slow to draw new economy investment" (<https://massinc.org/our-work/policy-center/gateway-cities/about-the-gateway-cities/>).

4) <https://www.census.gov/library/stories/2021/08/more-than-half-of-united-states-counties-were-smaller-in-2020-than-in-2010.html>

5) Despite the downturn in Barnstable County's population last decade, the Cape and Islands Region is no stranger to rapid growth. Rapid growth was measured in Cape Cod as far back as the 1930s, when Barnstable County grew by 15.4 percent compared to a state average of only 1.6 percent at the time. From the 1940s onward, this growth only accelerated, with rates often four or five times the statewide average. The 1970s in particular were a decade of rapid expansion, with Barnstable County growing by 53 percent and Dukes by 46.2 percent, even as the state was stagnant at just 0.8 percent from 1970 to 1980.

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- Meghan Flanagan, Senior Research Analyst
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- Jacob Harrington, Research Analyst
- Lily Harris, Research Analyst
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