Visualizing the Real Estate Landscape

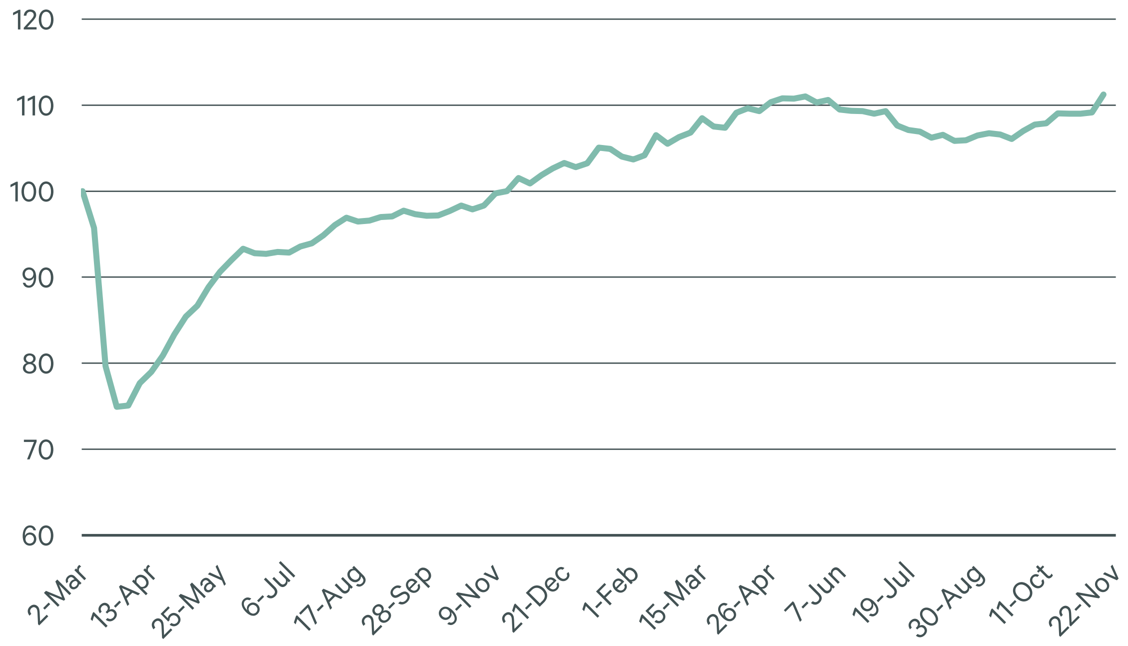
EA CHARTBOOK

December 2021

MATT MOWELL
ECONOMETRIC ADVISORS

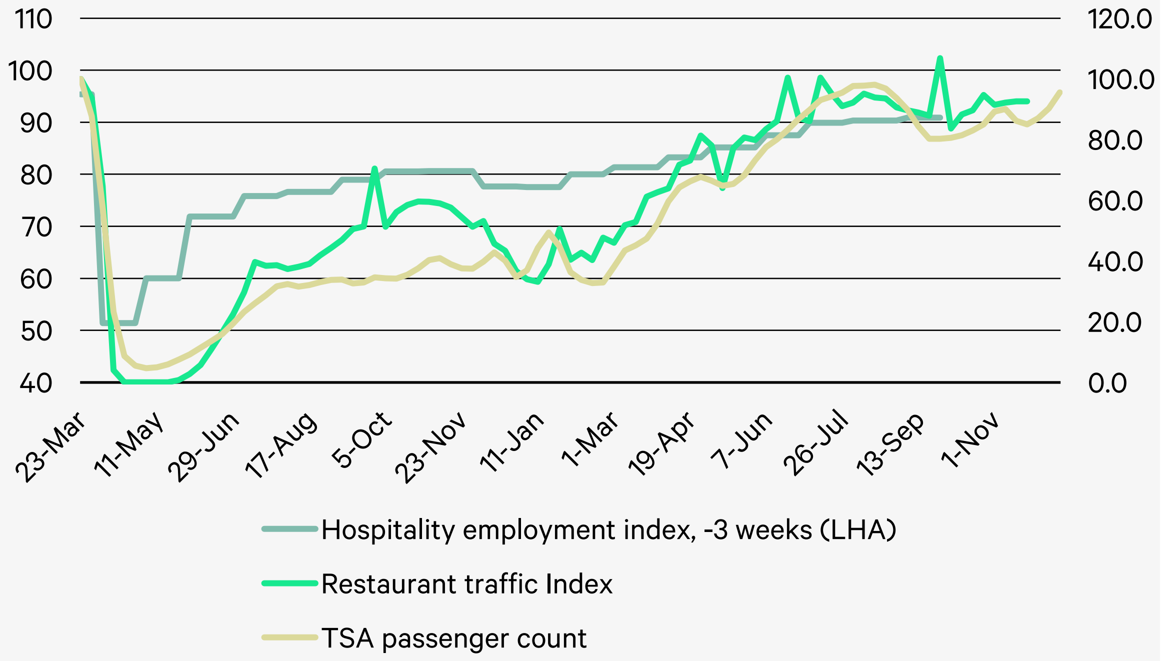
Activity is picking up moving into the holiday season

Weekly Leading Indicator Index



New York Federal Reserve

Week beginning on March 2nd = 100, weekly frequency



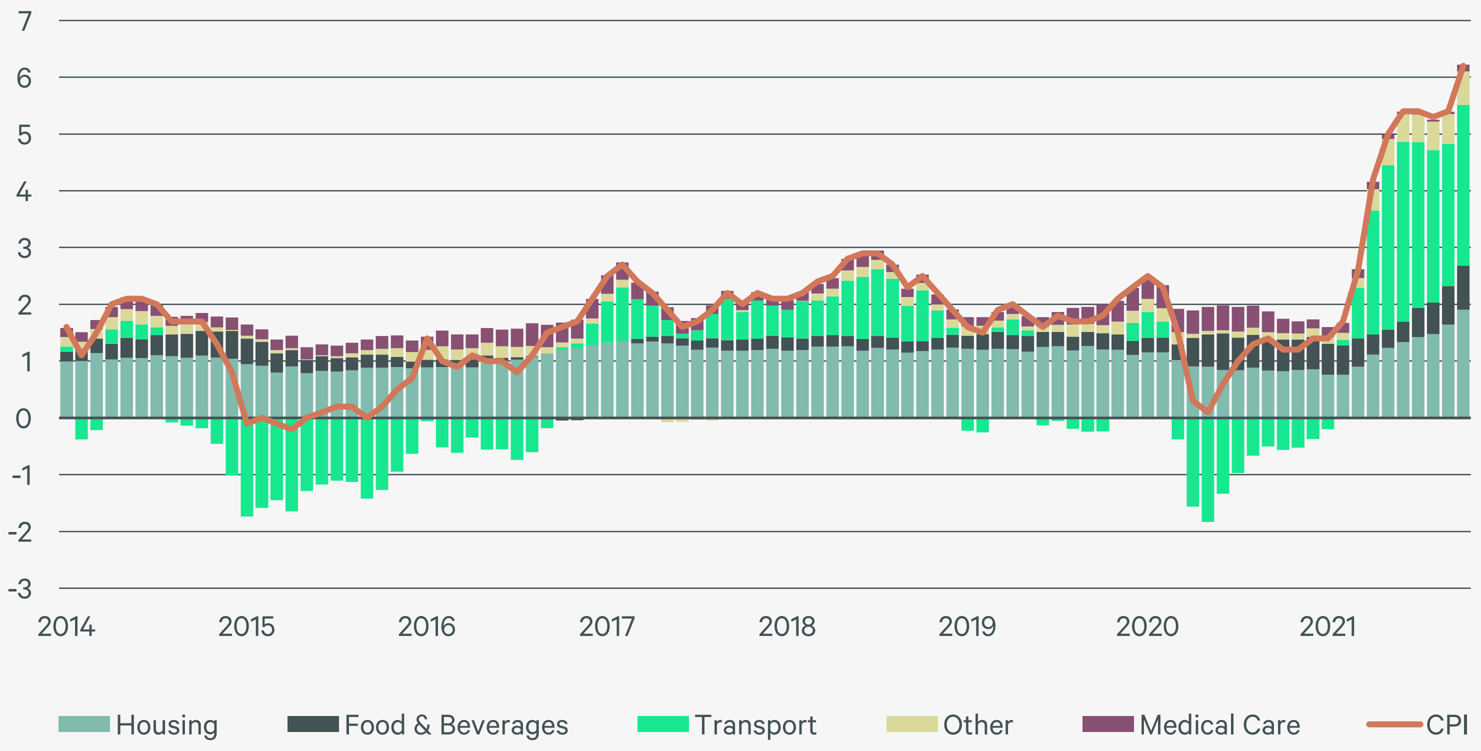
OpenTable, Kalibri Labs, Transportation Security Administration.

- Most economic indicators began trending upward in September / October after the summer Delta variant suppressed activity.
- Demand for consumer services picked up in the autumn, albeit the prospect of heightened COVID-19 cases and new variants pose notable risks.

What is driving inflation?

- The uptick in commodity prices and supply bottlenecks suggests inflation could accelerate further than expected in the near-term.
- Rising fuel and auto costs are pushing up transport costs. Similarly, rising fuel prices, along with apartment rents, is pushing up the housing component of CPI.

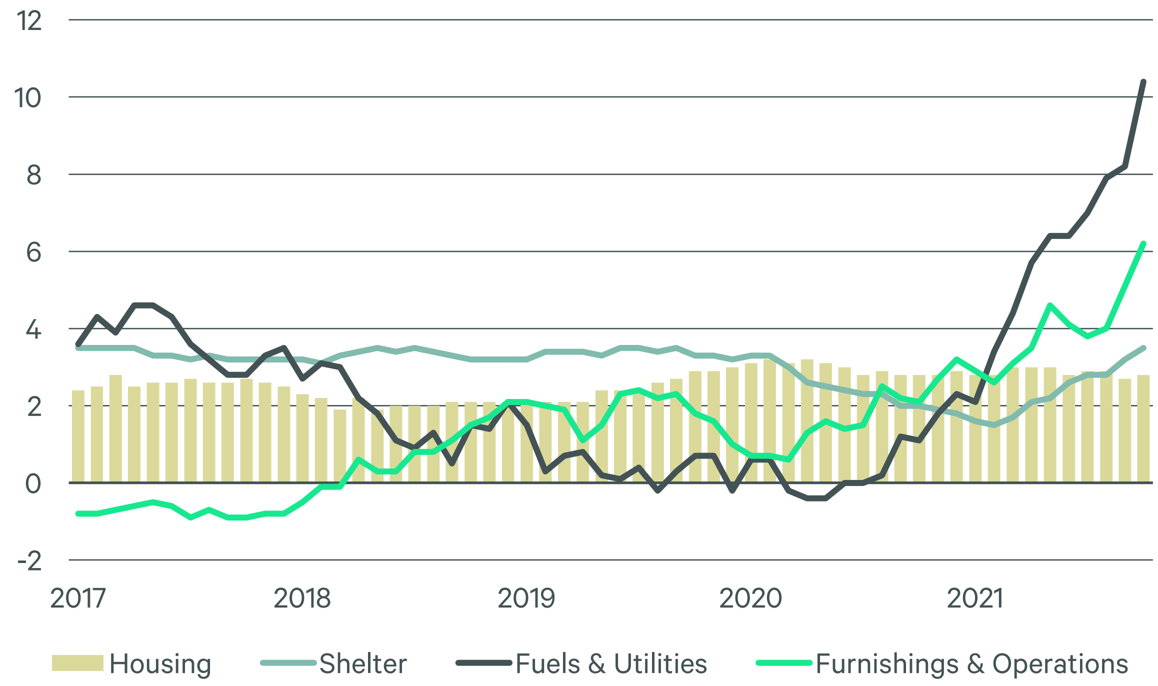
CPI, Y-o-Y change (%) and contribution from key components



U.S. Bureau of Labor Statistics

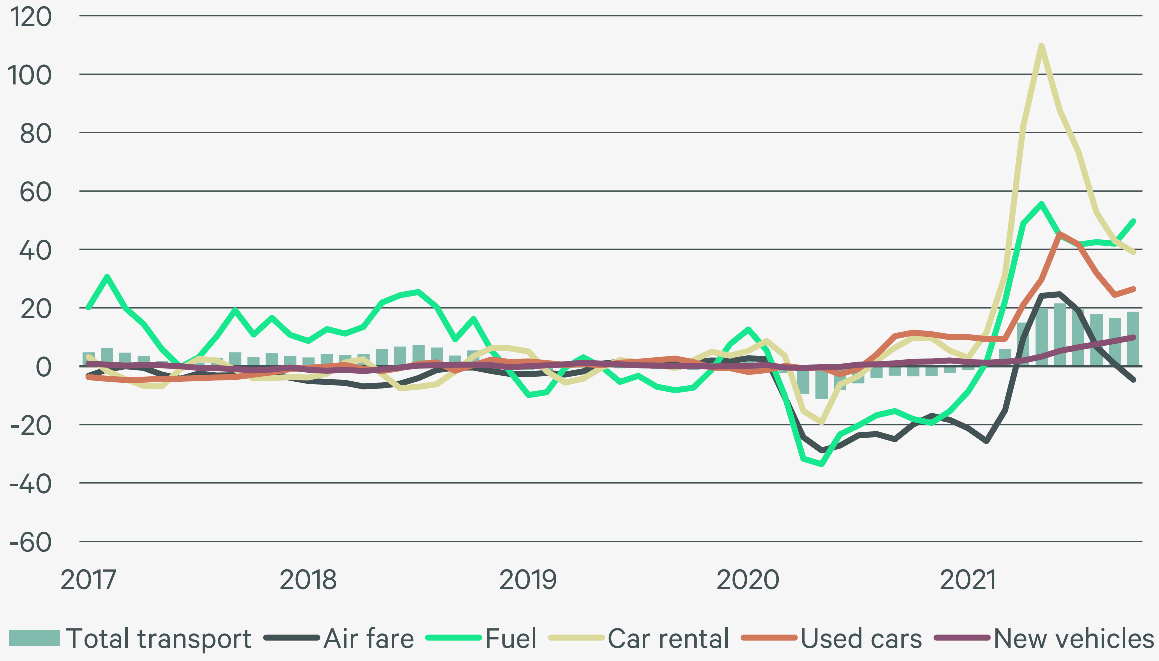
A deeper dive into housing and transport costs

Y-o-Y change in housing components of CPI (%)



U.S. Bureau of Labor Statistics

Y-o-Y change in transport components of CPI (%)

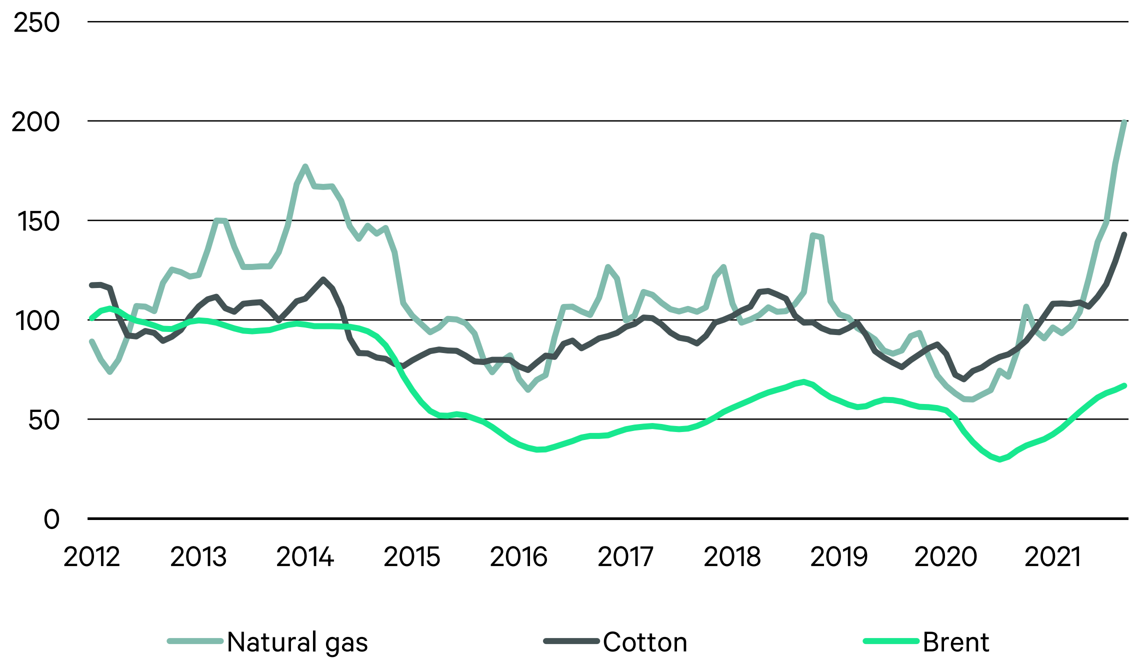


U.S. Bureau of Labor Statistics

- Higher commodity prices are permeating several consumer spheres, such as housing and transport.
- Rising apartment rents and heating costs are pushing up housing prices.
- Gasoline price and new car costs are pushing transport costs. Meanwhile, air fare costs are declining.

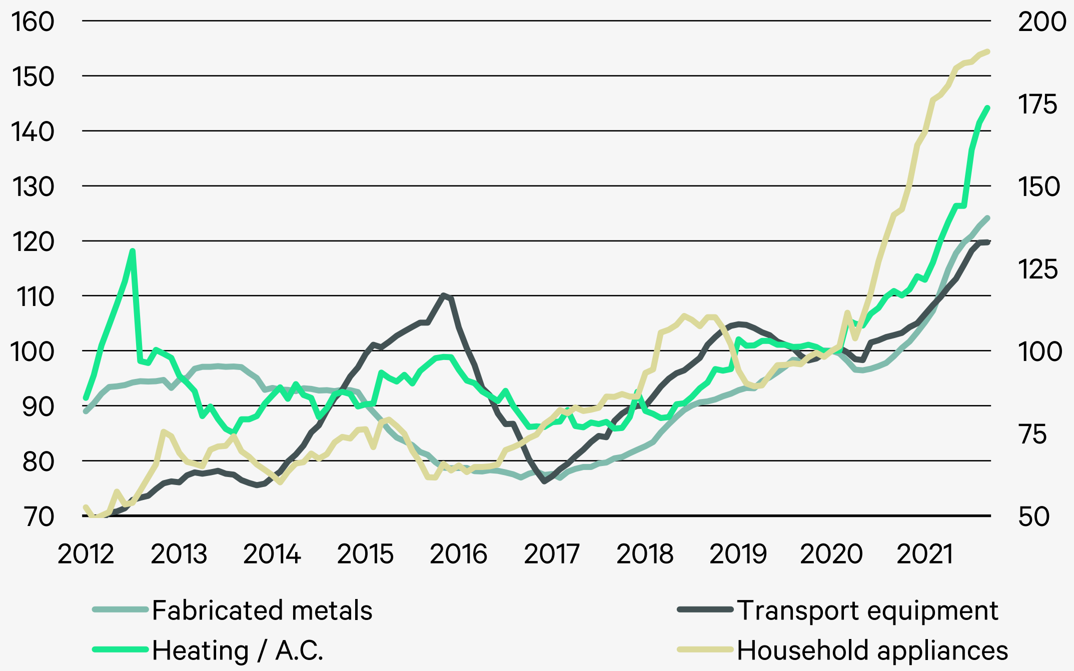
Supply bottlenecks remain a problem for the global economy

Commodity price index (2012 = 100)



Energy Information Administration, OPEC, Natural Resources Canada, Intercontinental Exchange.

Unfilled goods orders index (2020=100)

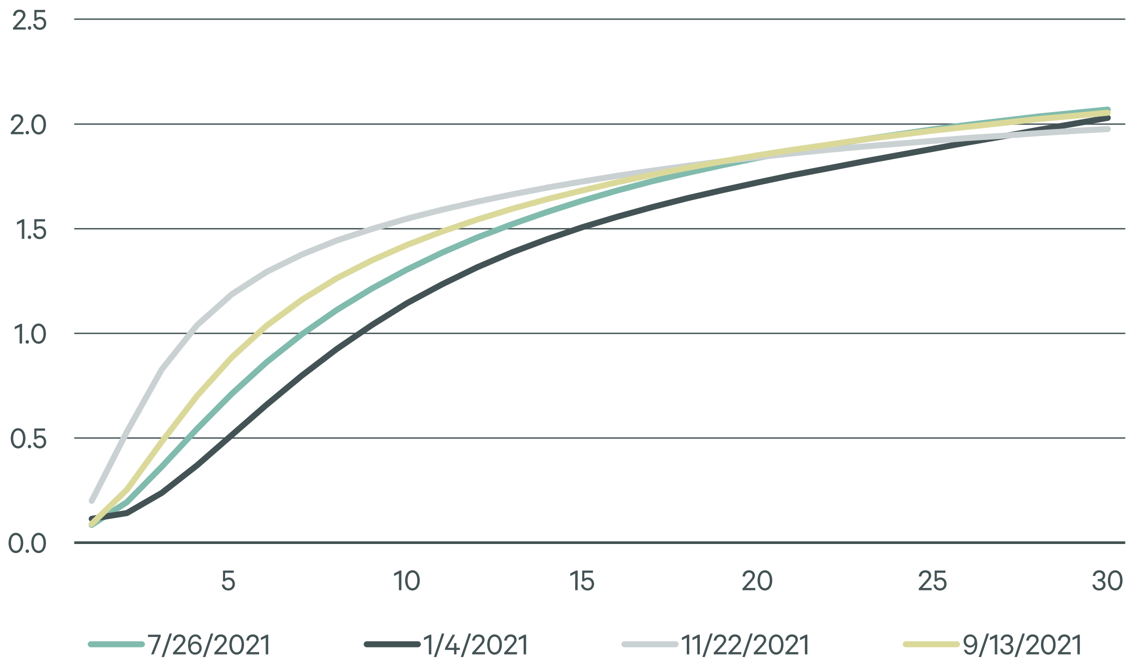


U.S. Census.

- There is a lag between rising energy demand and when oil & gas producers can bring on more production capacity. This is causing prices to spike as the Northern Hemisphere moves into the winter months.
- A shortage of feedstock is causing manufacturing backlogs, especially for durable goods.

Markets expect inflation to be heightened in the near-term

Yield curve across 2021 (%)



U.S. Federal Reserve

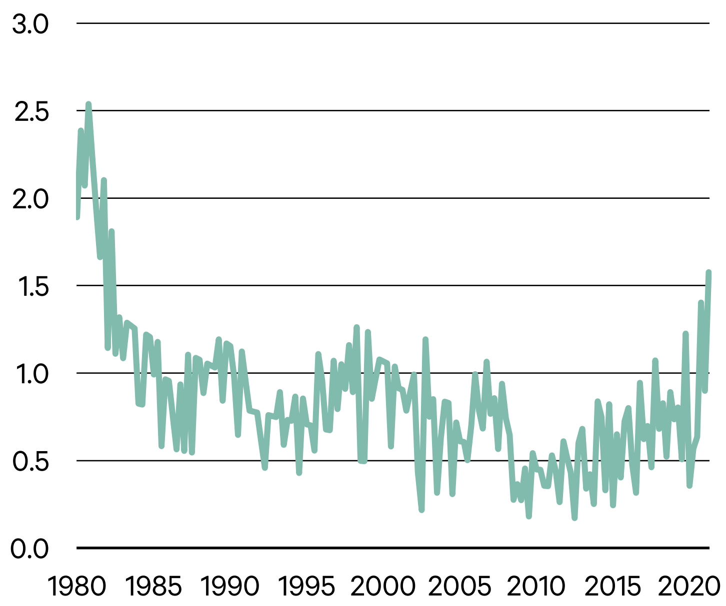
Spread between 10-year and 5-year Treasury yields (ppts)

Macrobond

- The yield curve has flattened in recent months as expectations for near-term inflation are heightened.
- Treasury markets appear to be pricing in multiple rate hikes for 2022.

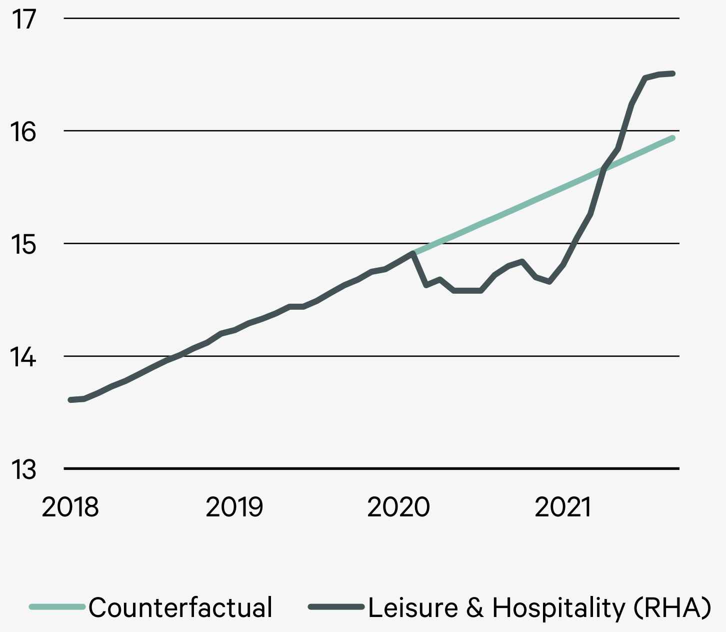
A tight job market will put upward pressure on prices

Employment Cost Index, Q-o-Q change (%)



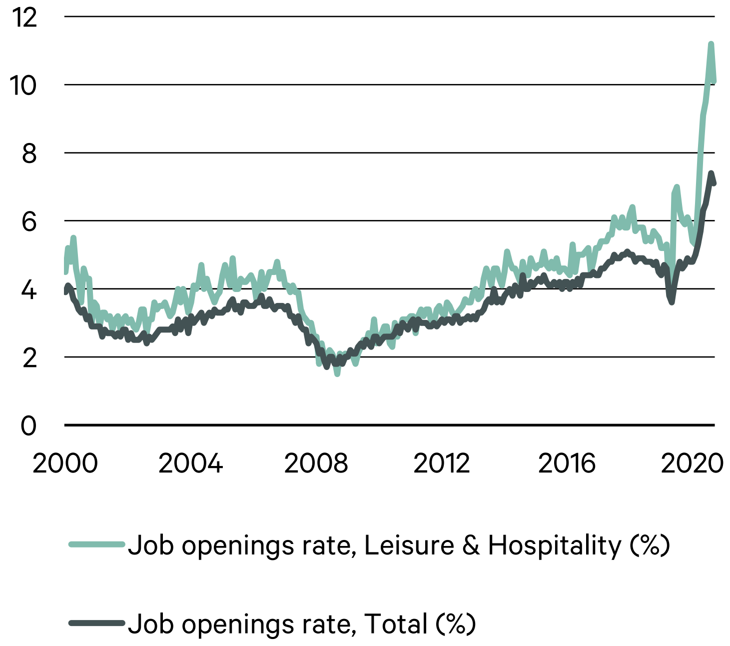
U.S. Bureau of Labor Statistics.

Leisure & hospitality, avg. hourly earnings



U.S. Bureau of Labor Statistics.

Job openings rate (%)

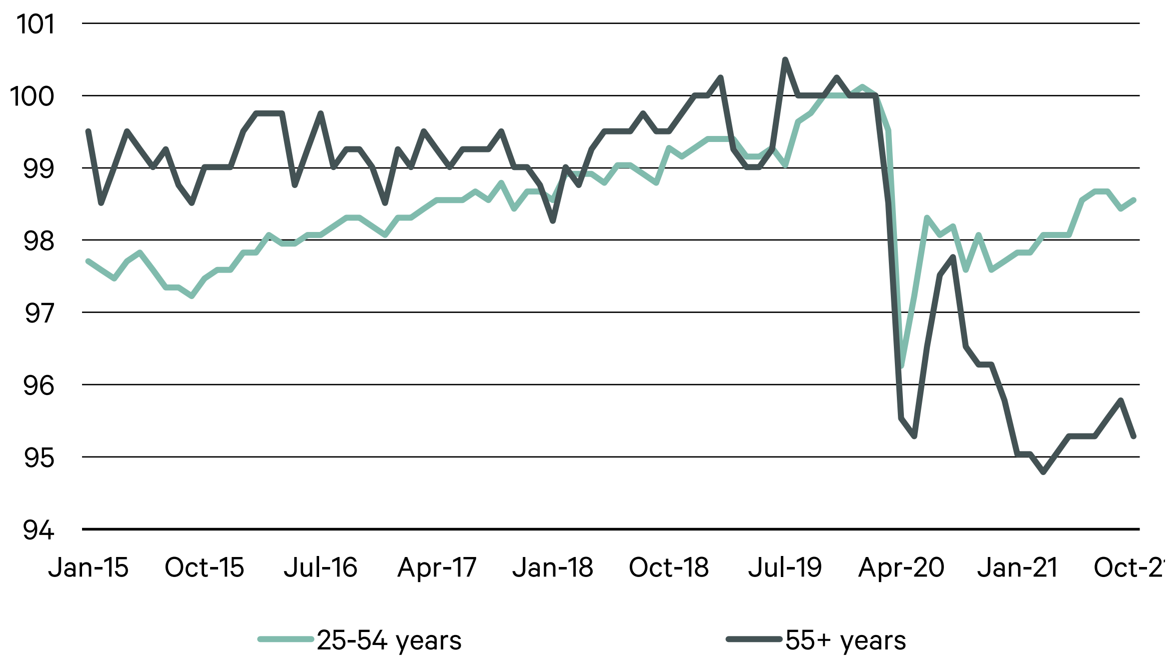


U.S. Bureau of Labor Statistics.

- Rising labor costs are also exerting upward pressure on CPI. Indeed, the Employment Cost Index posted the greatest quarterly growth in Q1 since the early 1980s.
- Wage acceleration has been most significant within the leisure & hospitality sector, in which average hourly wages have now exceeded their pre-pandemic trend. The cause of this wage spike is a significant mismatch between supply and demand evidenced by the heightened job openings rate in the leisure & hospitality space.

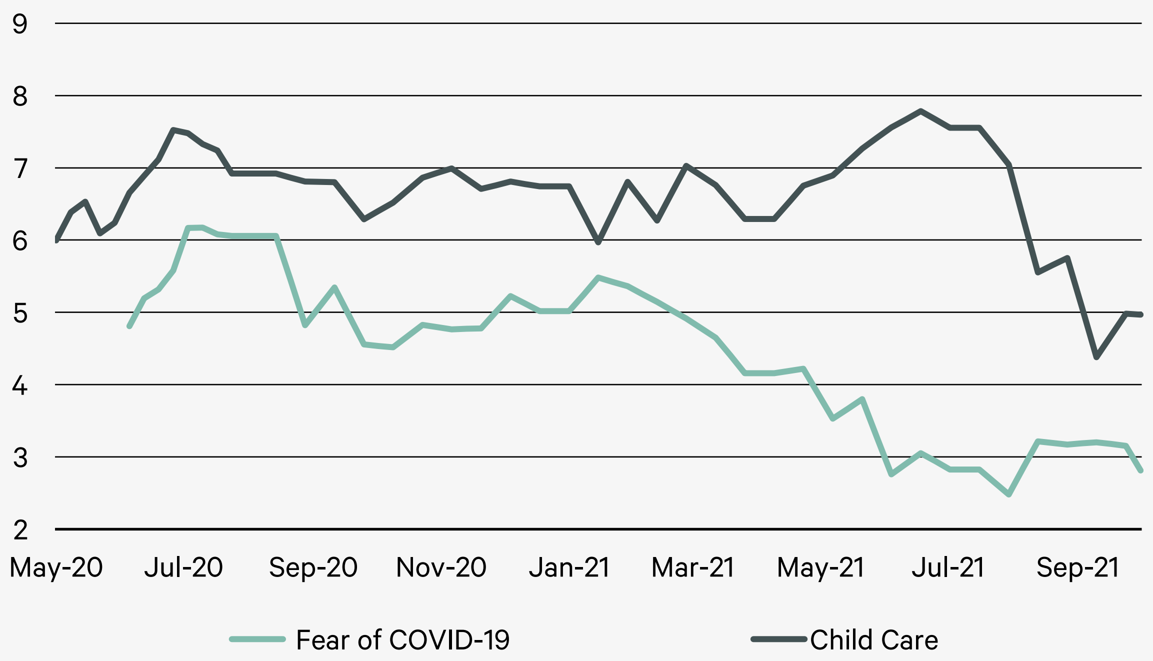
There are several factors driving the labor shortage

Labor force participation rate index by age, February 2020 = 100



U.S. Bureau of Labor Statistics.

Reasons people are not working (millions)

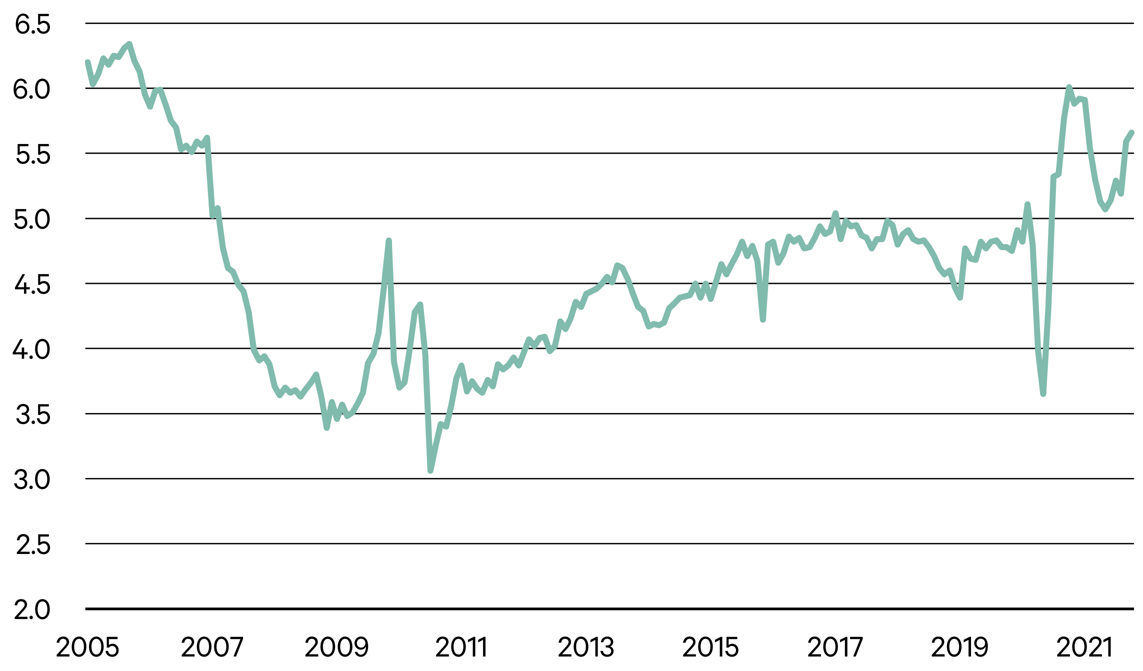


U.S. Census Household Pulse Survey.

- Explanations for the labor shortage include a reported uptick in 'Boomers' choosing to retire. Evidence for this includes very sluggish labor market participation amongst the 55+ age cohort.
- Many are not working due to childcare issues, which could explain why female labor force participation has been stagnant.

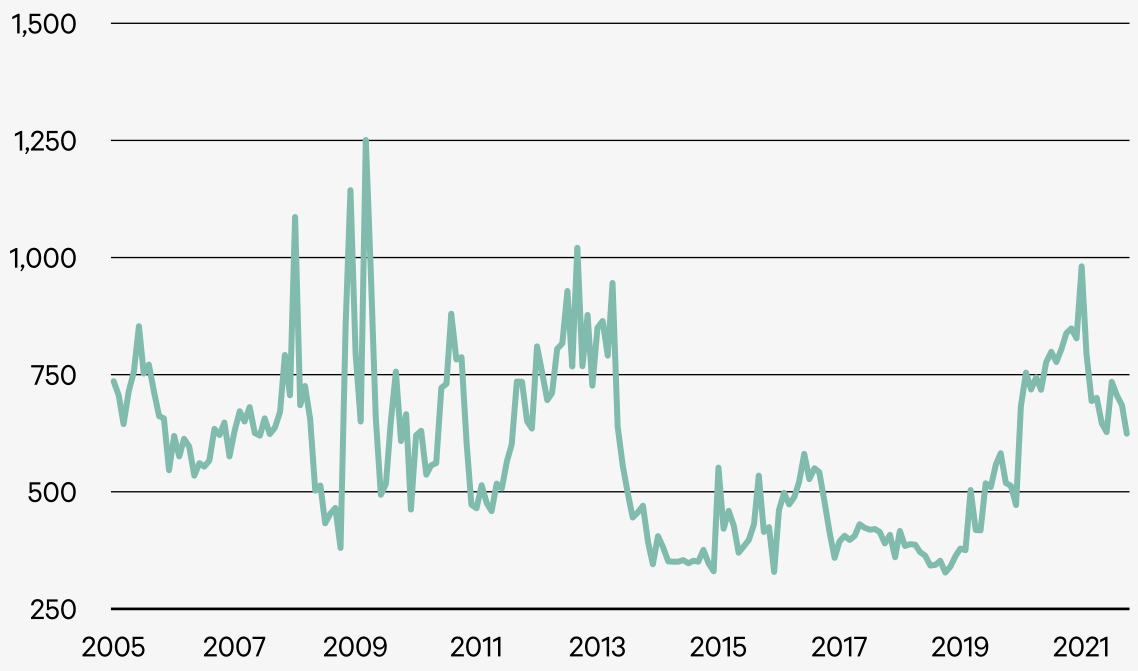
Home sales remain down from their late 2020 peak

Home sales, millions



National Association of Realtors, Federal Reserve, Mortgage Bankers Association.

Mortgage application index

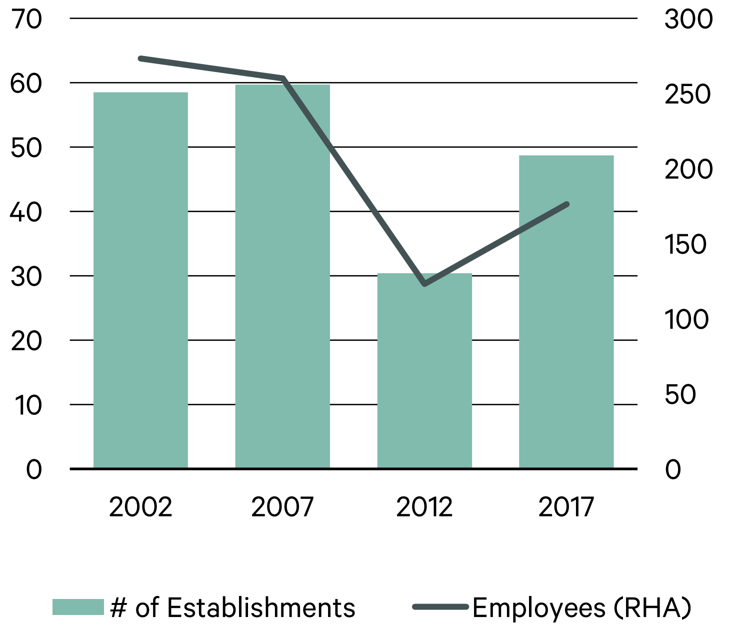


National Association of Realtors, Federal Reserve, Mortgage Bankers Association.

- Single-family sales and mortgage applications have stalled due to lack of for-sale product and poor affordability.
- It is unlikely that home sales and its ancillary activity (e.g., furnishing sales) will be a major contributor to economic growth in the very near-term. Current market conditions are fertile ground for single-family, for-sale housing development.

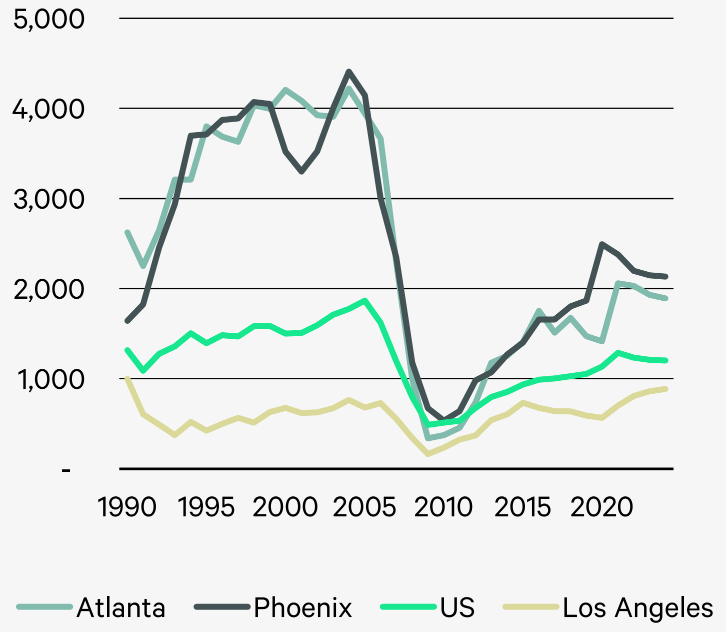
Factors suppressing housing stock and affordability

of homebuilding outfits & employees (000s)



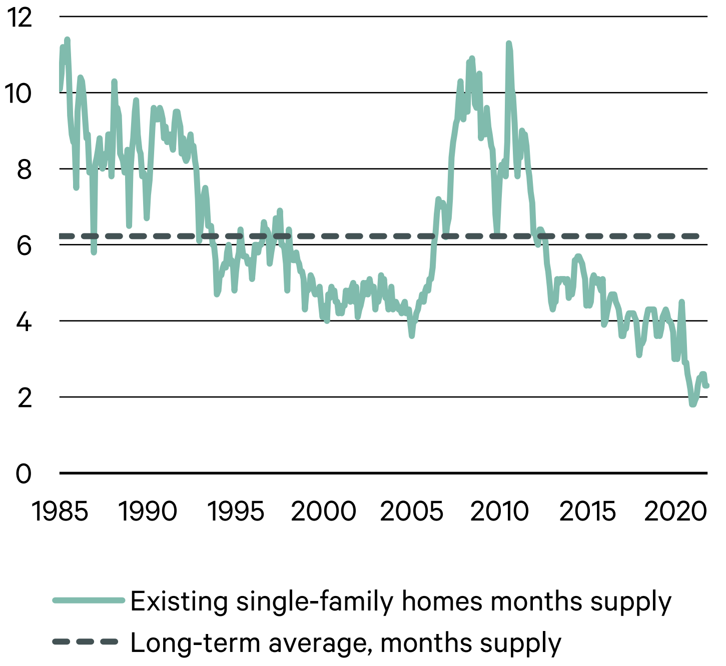
U.S. Economic Census.

Housing starts per 100k households



Oxford Economics, CBRE EA..

Number of months supply of homes for sale



National Association of Realtors.

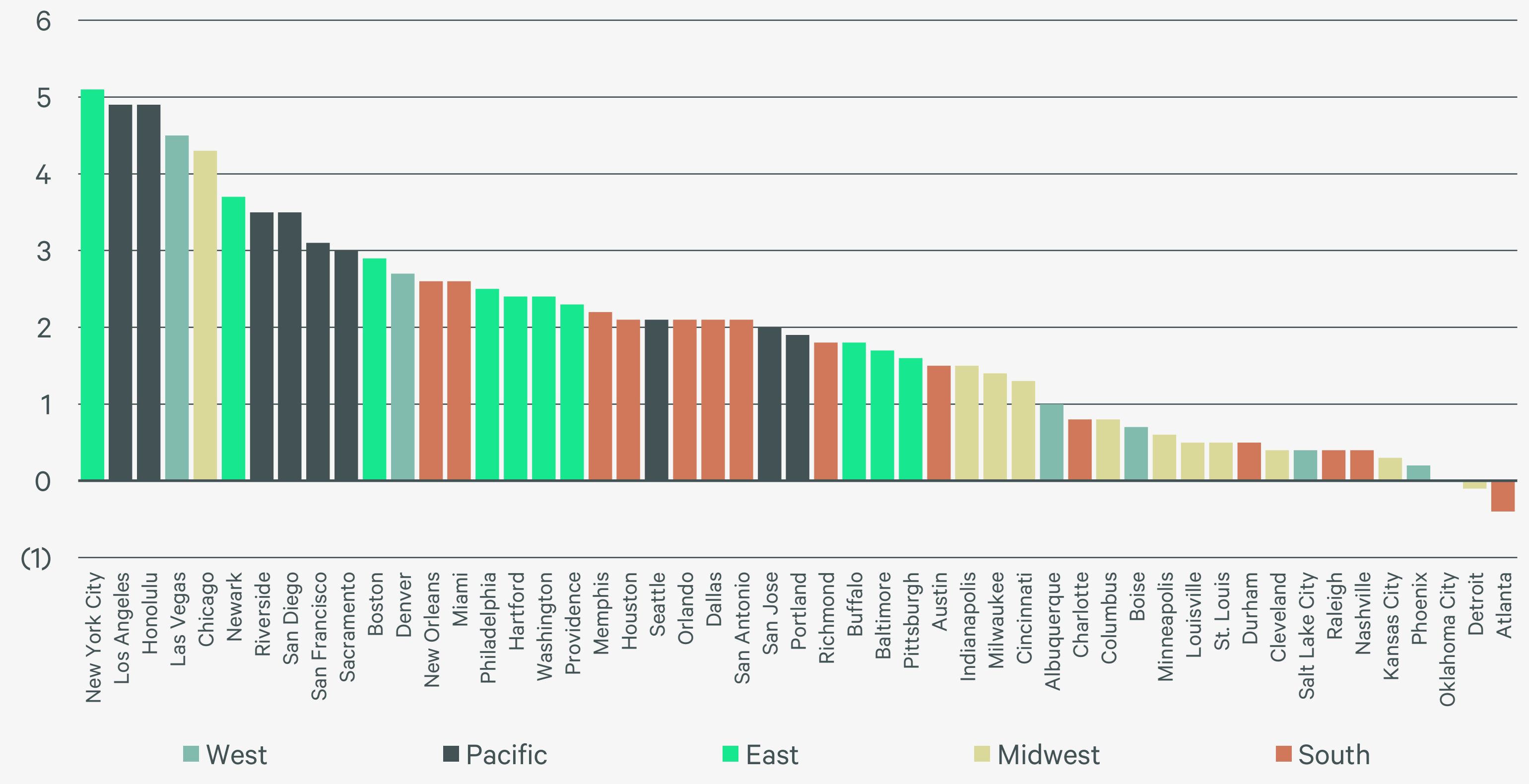
- In the wake of the Global Financial Crisis (GFC) many small contractors went out of business and craftsmen found new careers. Consequently, U.S. homebuilding capacity remains suppressed relative to the early-2000s.
- Housing starts per 100K households remains quite low relative to history and even in sprawling, Sunbelt metros that traditionally have limited planning and zoning regulations.

Labor market slack is more notable on the coasts

- Cities with strict social distancing rules (e.g., New York, Los Angeles) saw the greatest labor market disruption. Further, places with a sizable hospitality sector (e.g., Las Vegas, Orlando, New Orleans) continue to suffer heightened unemployment rates.

- Conversely, places with a more *laissez-faire* approach to social distancing saw less damage to local labor markets.

Current unemployment rate relative to February 2020 levels (percentage points)



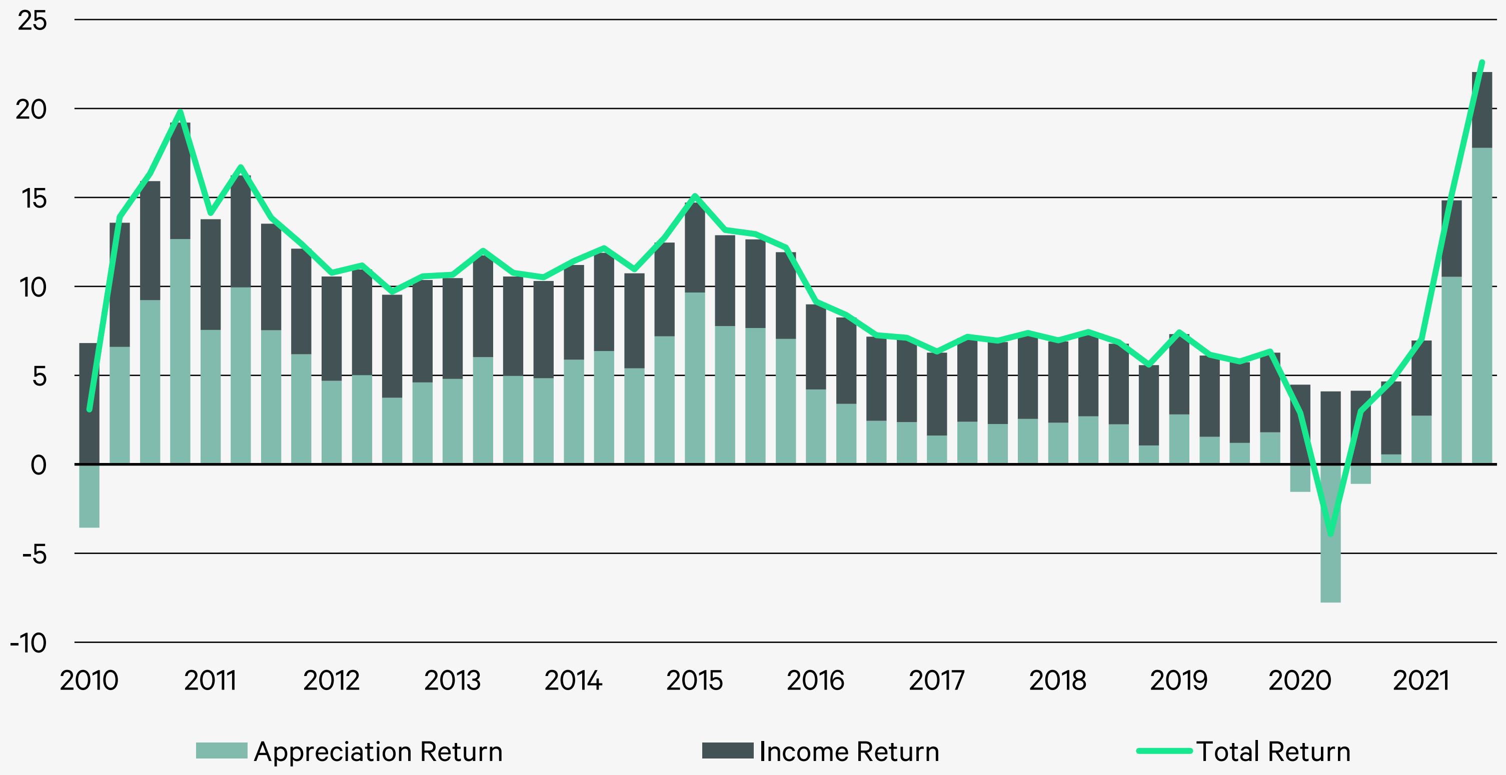
U.S. Bureau of Labor Statistics.

Commercial Real Estate

1

Real estate valuations have whipsawed!

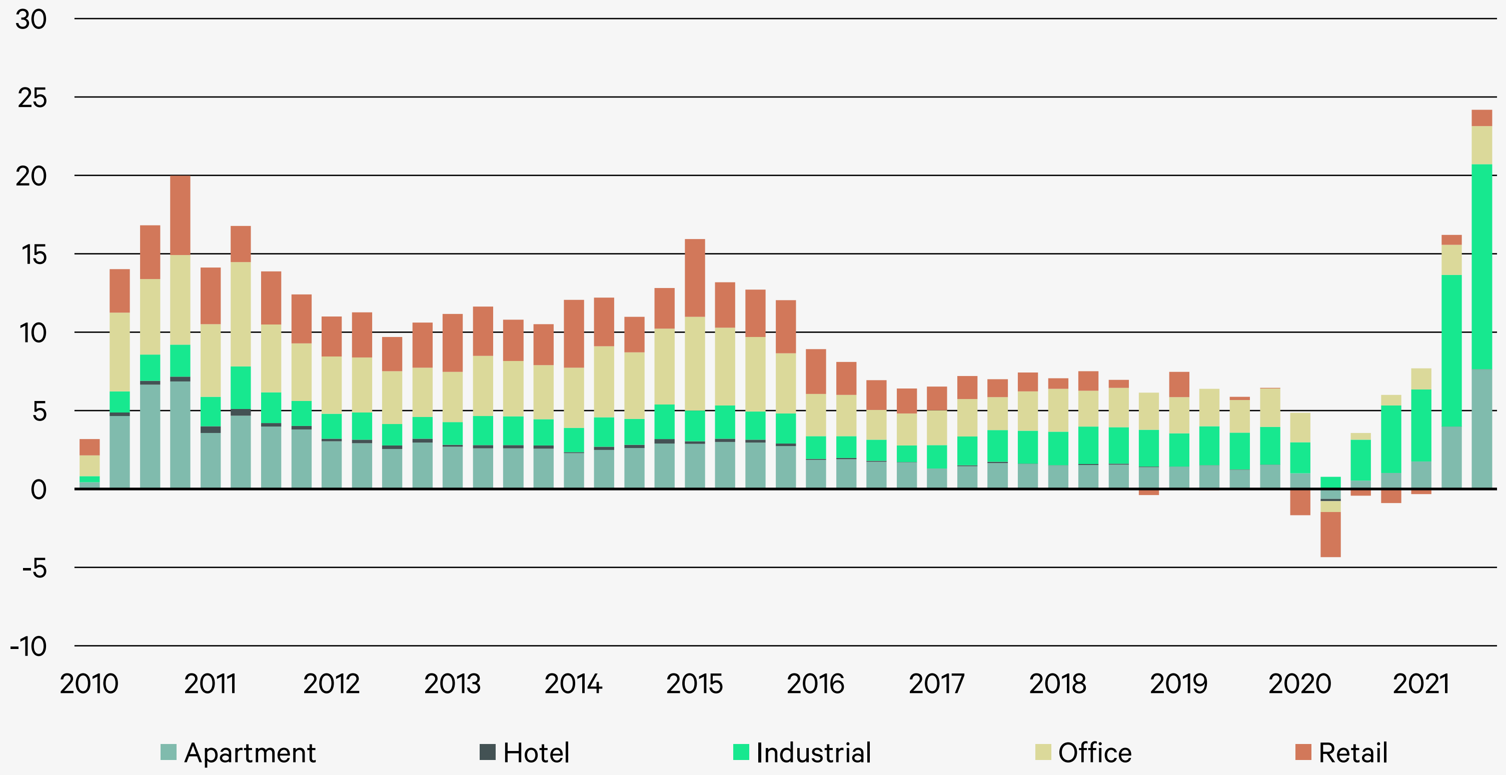
Composition of all property returns (%)



NCREIF.

Industrial and apartment properties are driving NCREIF returns

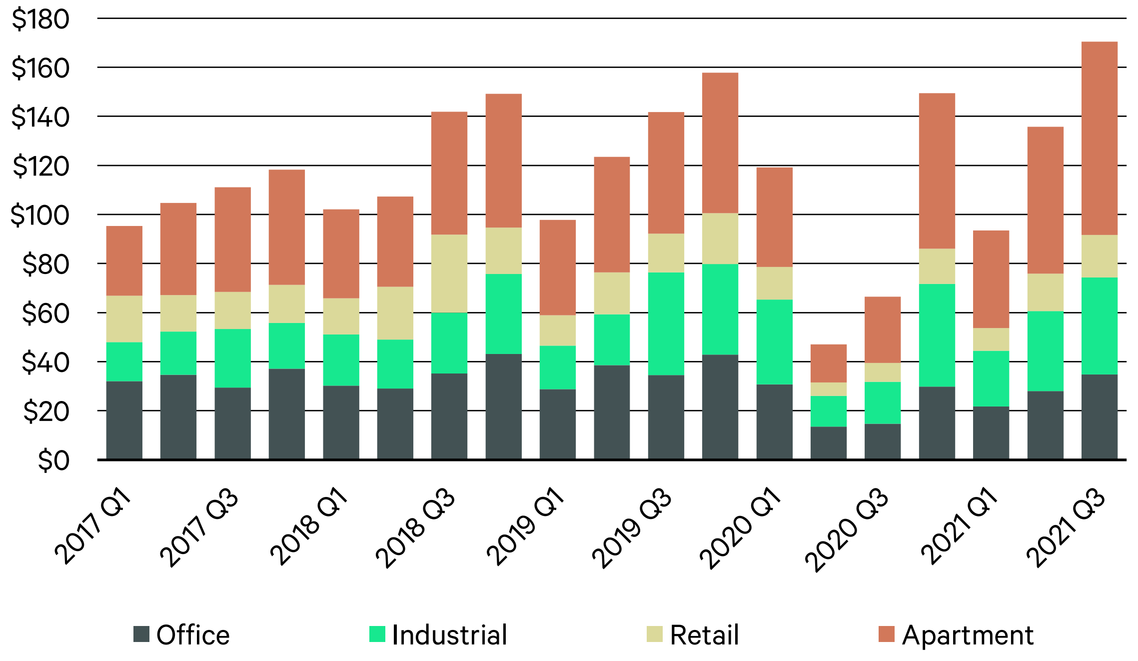
Sector composition of all-property total returns (%)



NCREIF. *Due to compounding factors among the components of total returns, values on this chart will slightly differ from the previous chart.*

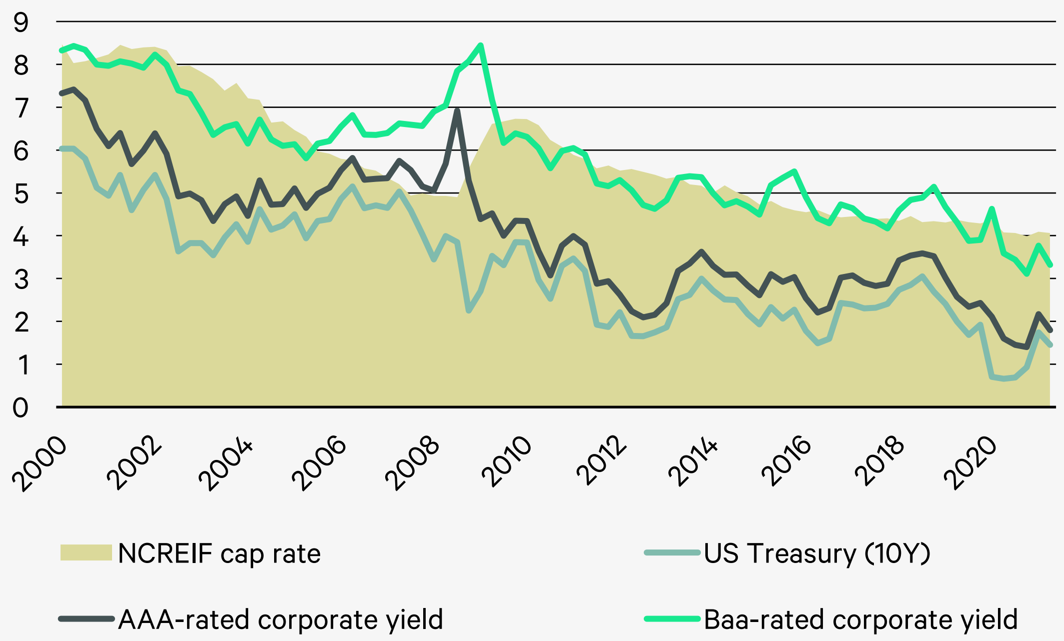
Investment activity is recovering, and cap rates are trending down

Quarterly sales volume by property type (billions)



Real Capital Analytics, CBRE EA.

Asset class yield (%)



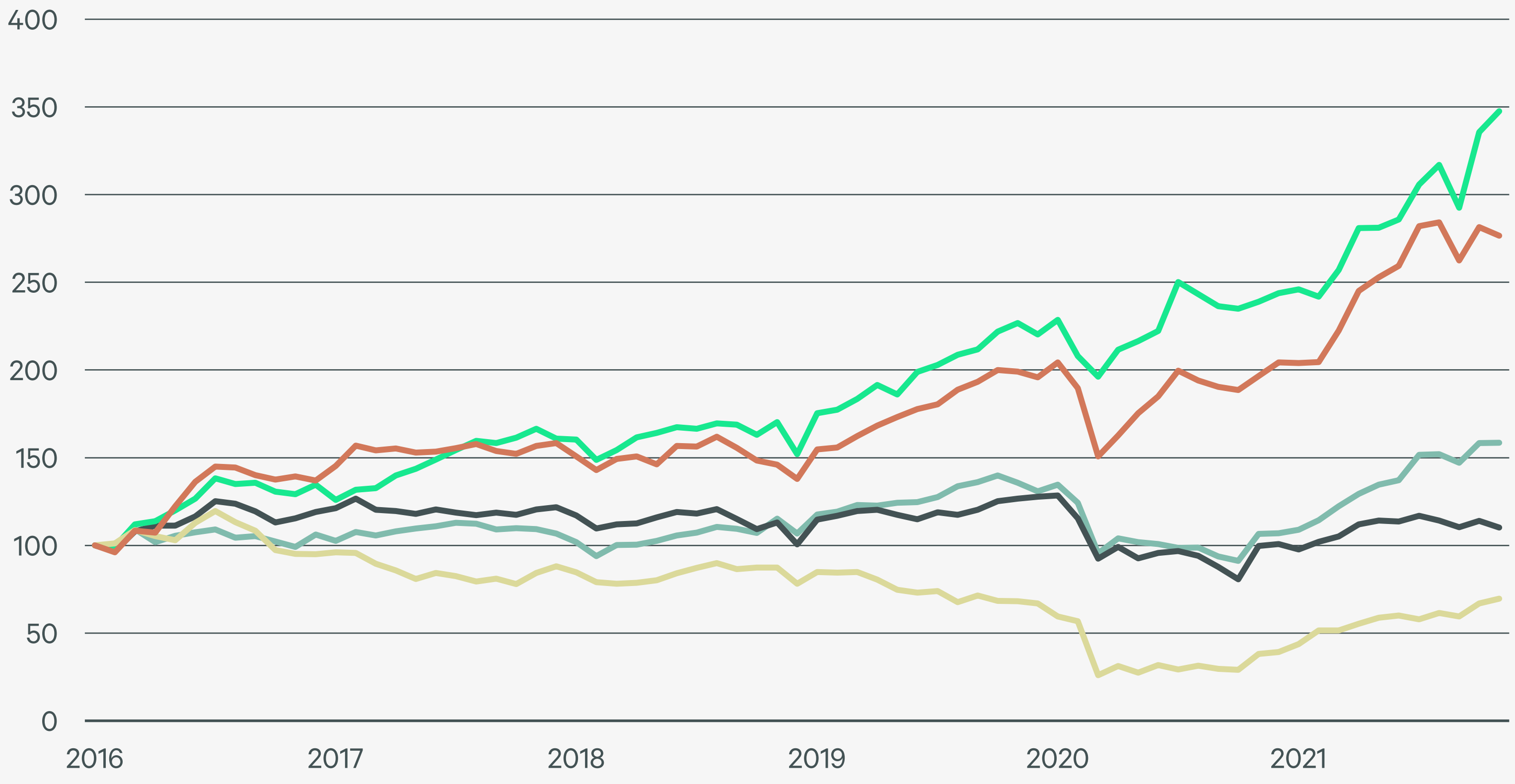
NCREIF, CBRE EA.

- The sturdy prospects for apartment and industrial properties are driving growth in commercial sales volume.
- Further, pricing for trades is holding firm; however, evidence suggests that buyers are generally focused on higher quality properties.

Signals from the REIT market suggest a soft office market

- The REIT market provides some insight into how private equity real estate has performed.
- The single-family rental REIT index has solidly outperformed multifamily rentals and was only bested by the industrial REIT index.
- Indirect office performance has not kept pace with the broader group in recent quarters.

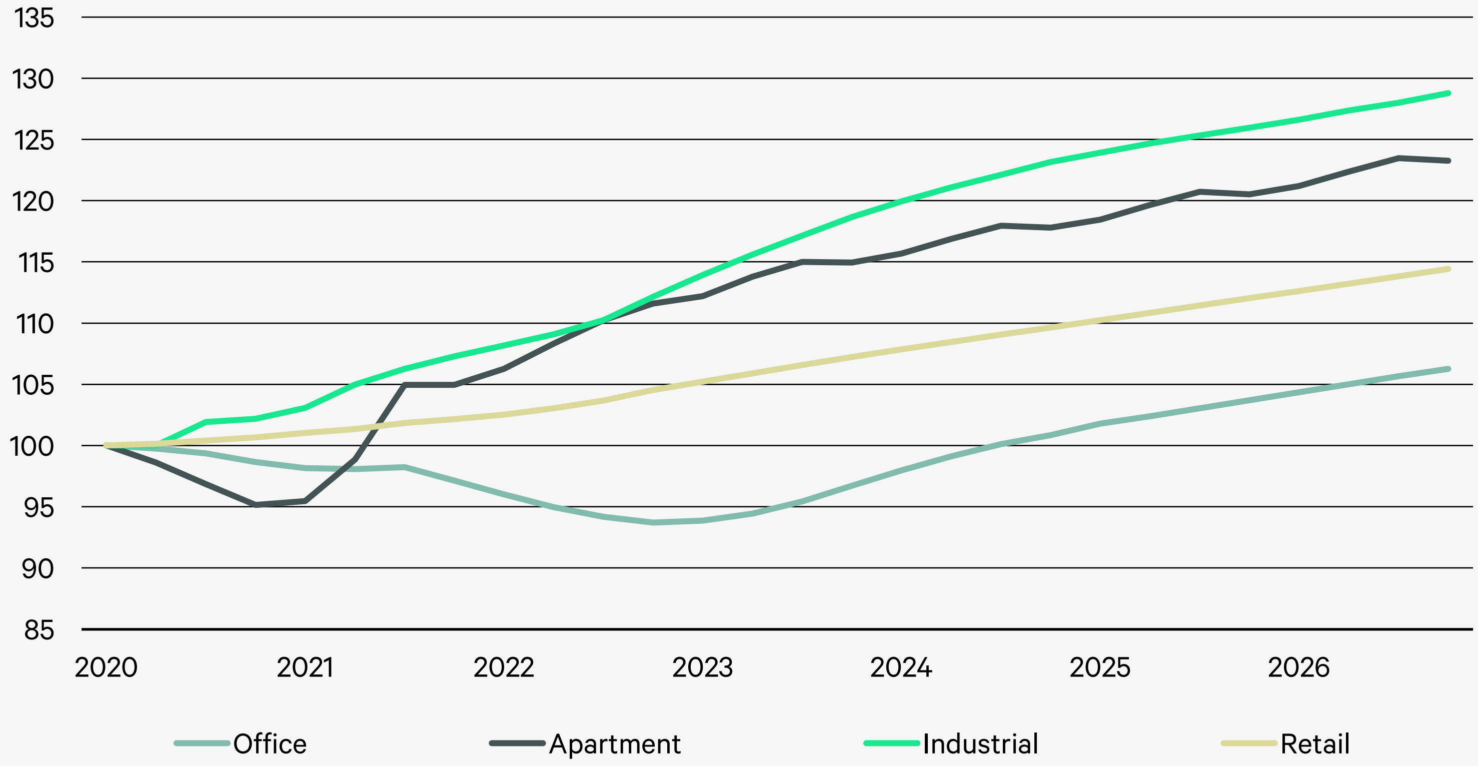
NAREIT price return index by property type, 2016 = 100



NAREIT, Macrobond

Office rents will struggle for the foreseeable future

Rent index, 2020 Q1 = 100

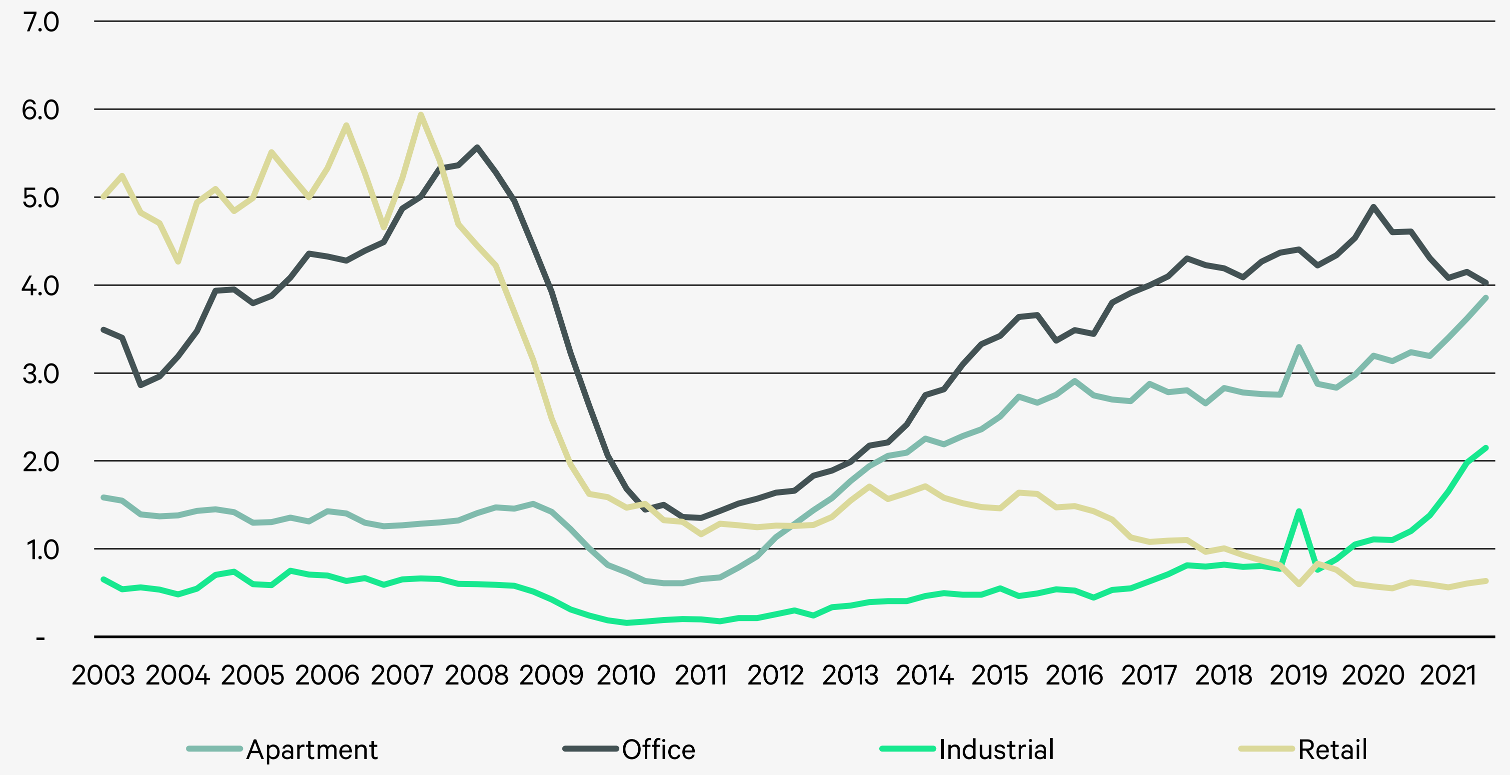


CBRE EA

Industrial and apartment pricing has driven new development

- Supply represents a near-term threat to the office market but in the long run, developers are likely to show restraint amid uncertainty around virtual work.
- Industrial supply has made an upside breakout in late 2020 as developers responded to an onslaught of logistics demand.
- Like industrial, the apartment market is seeing an increase in development as occupancies and rents trends back to pre-COVID levels.

Square feet (units) underway as a share of market inventory (%)



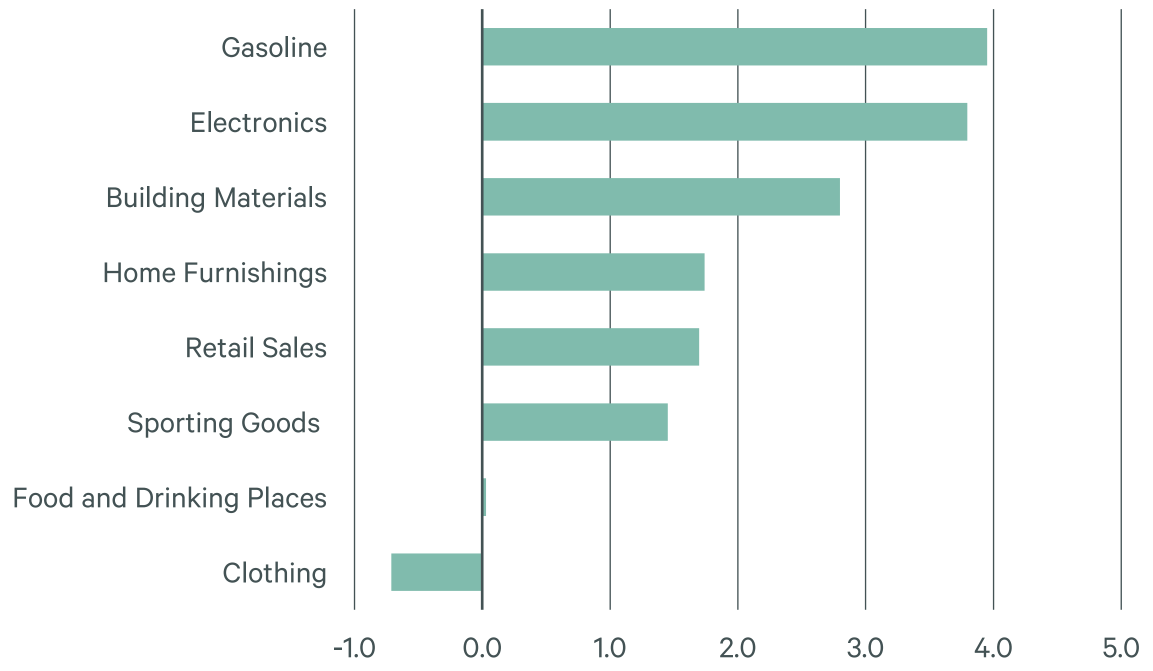
CBRE-EA

U.S. Retail

2

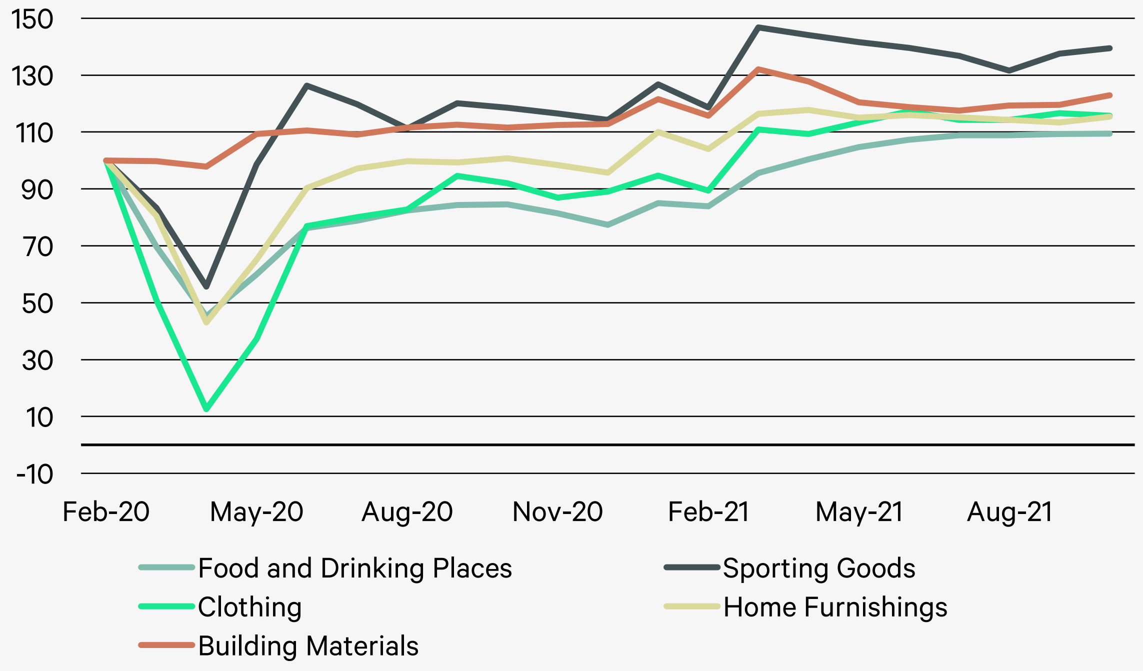
Consumers continue to shift around spending

Month-on-month retail sales change, September (%)



CBRE EA

Retail sales index, February 2020 = 100

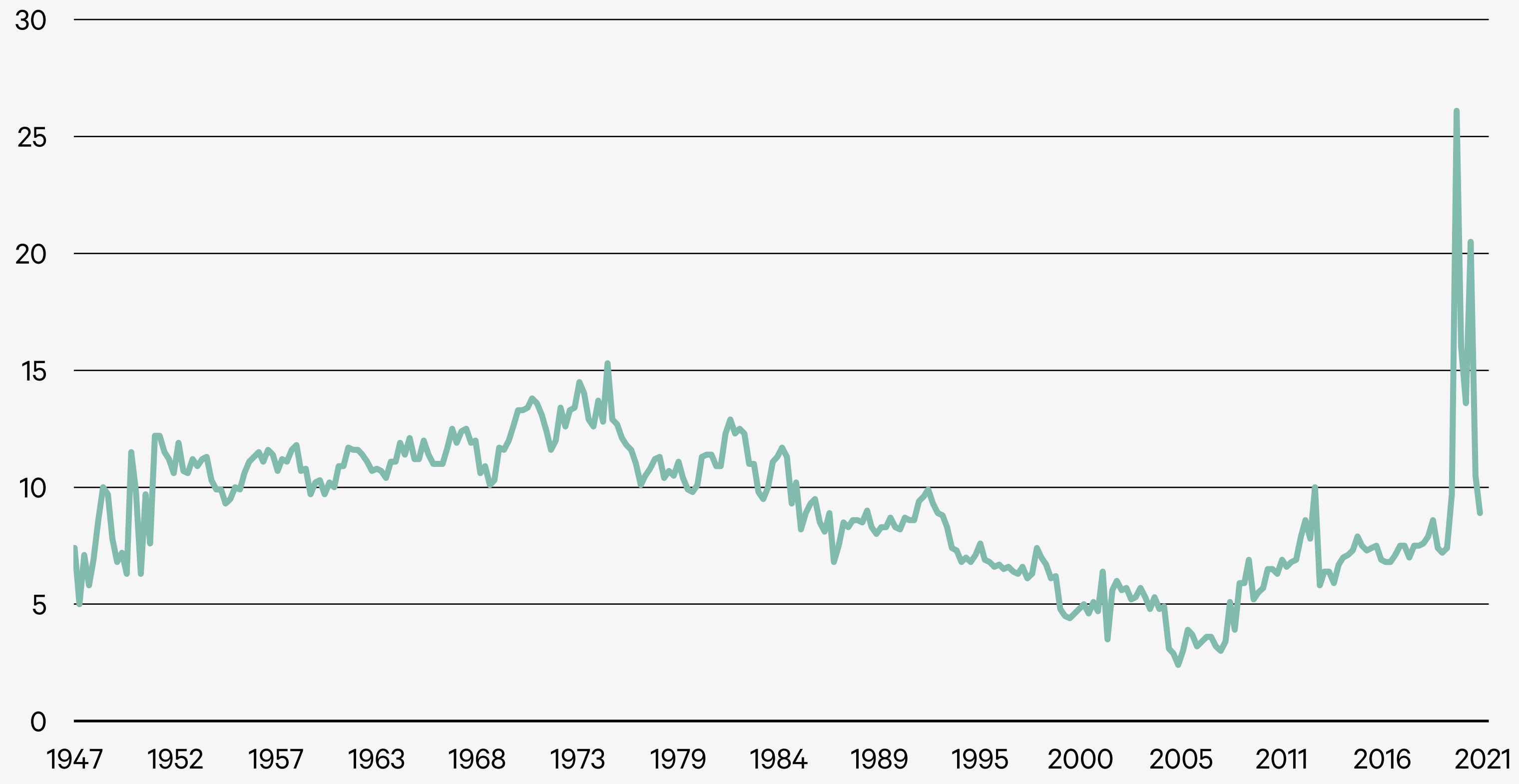


CBRE EA

- Consumers spent more on durables, barring gasoline, and less on services in September. Monthly spending patterns are poised to osculate with public health trends.
- Many households continue to dedicate more money to sporting goods and building supplies.

There is less pent-up spending demand from savings

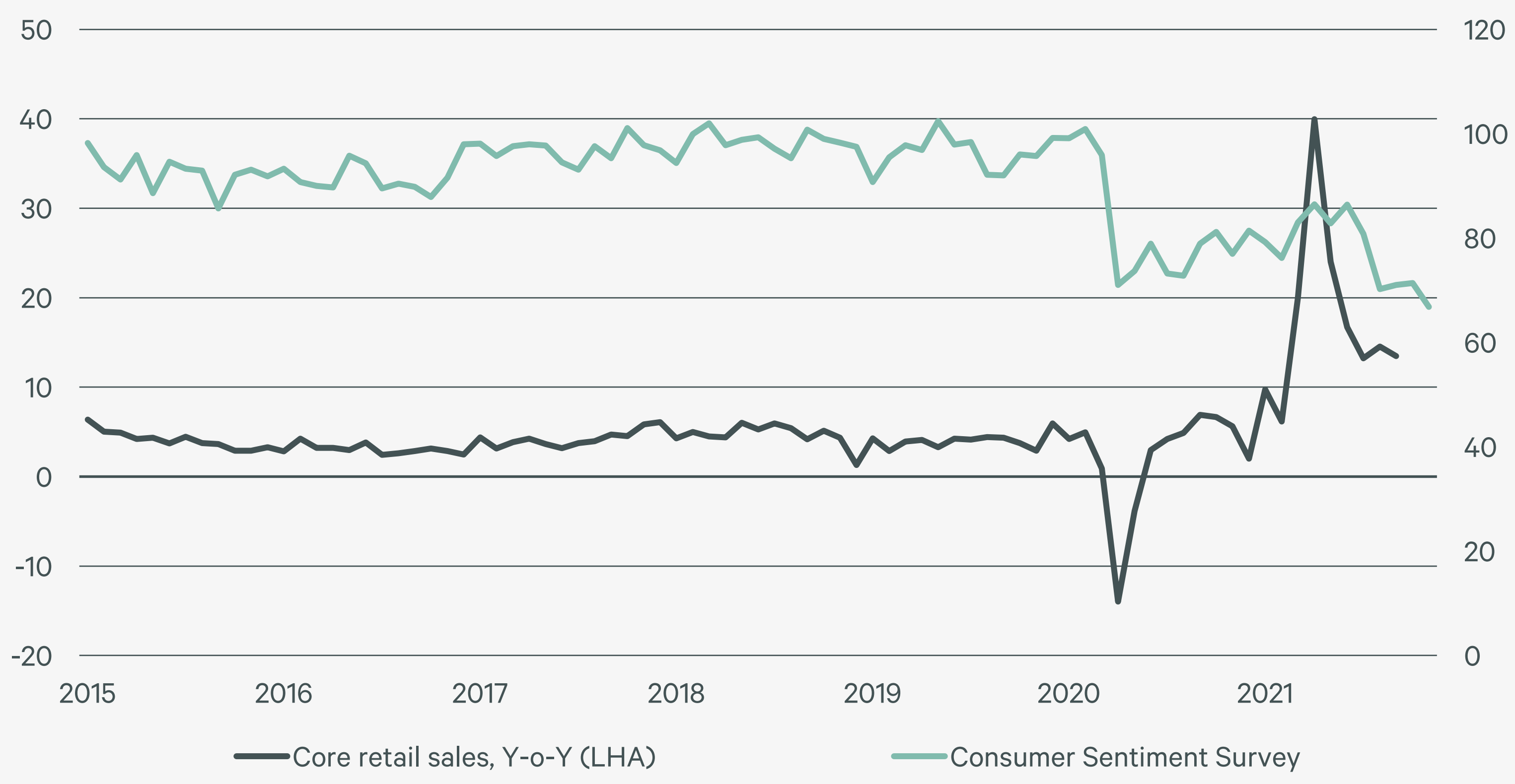
Personal savings rate (%)



CBRE EA

Consumer sentiment surveys and sales are not aligned

Core retail sales, Y-o-Y (%) and the Consumer Sentiment index



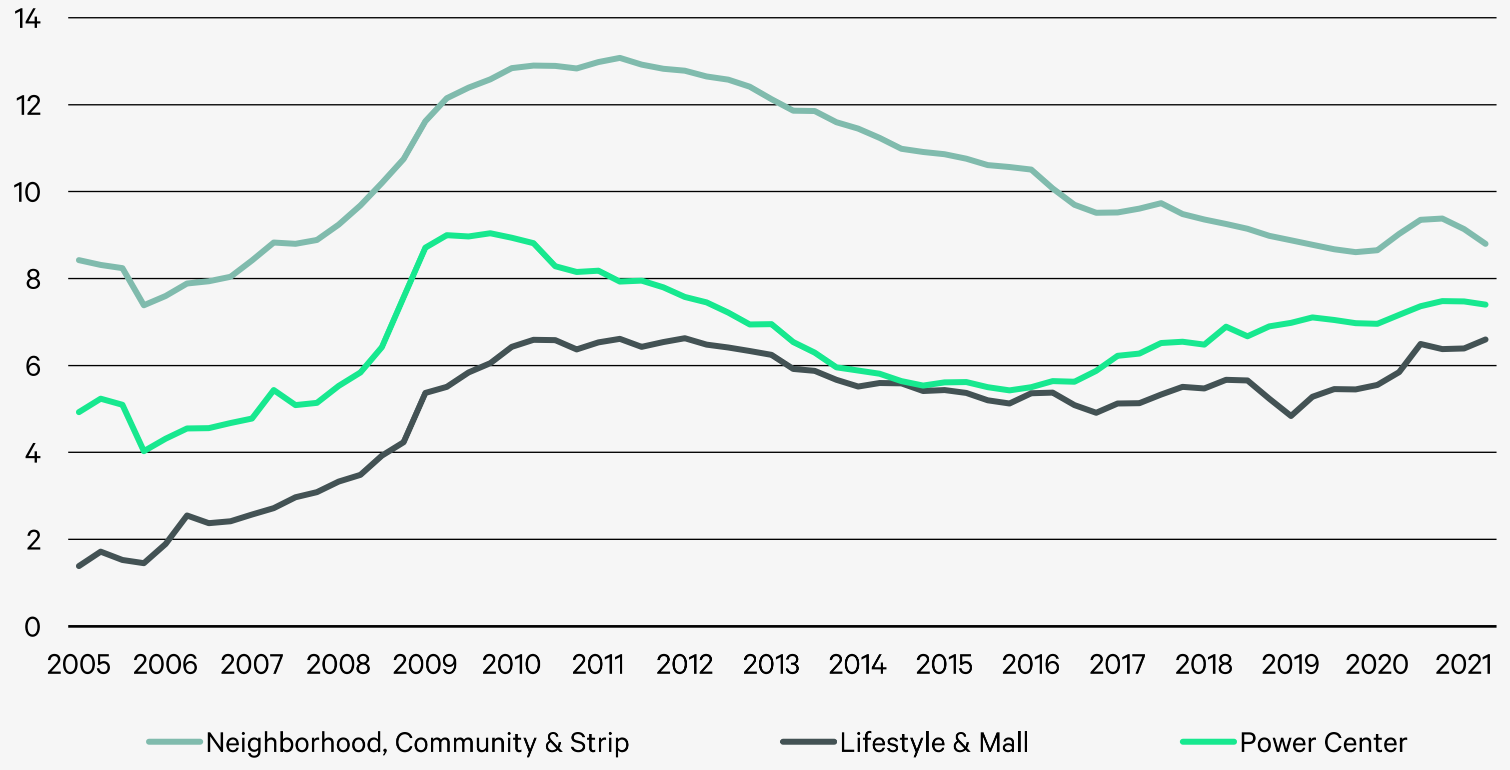
University of Michigan, U.S. Census

Chain bankruptcies are pushing up lifestyle & mall availability rates

- Rising chain store bankruptcies have caused the Lifestyle & Mall and Power Center availability rate to increase in recent years.

- COVID-19 caused an uptick in neighborhood center availabilities as some small businesses permanently closed.

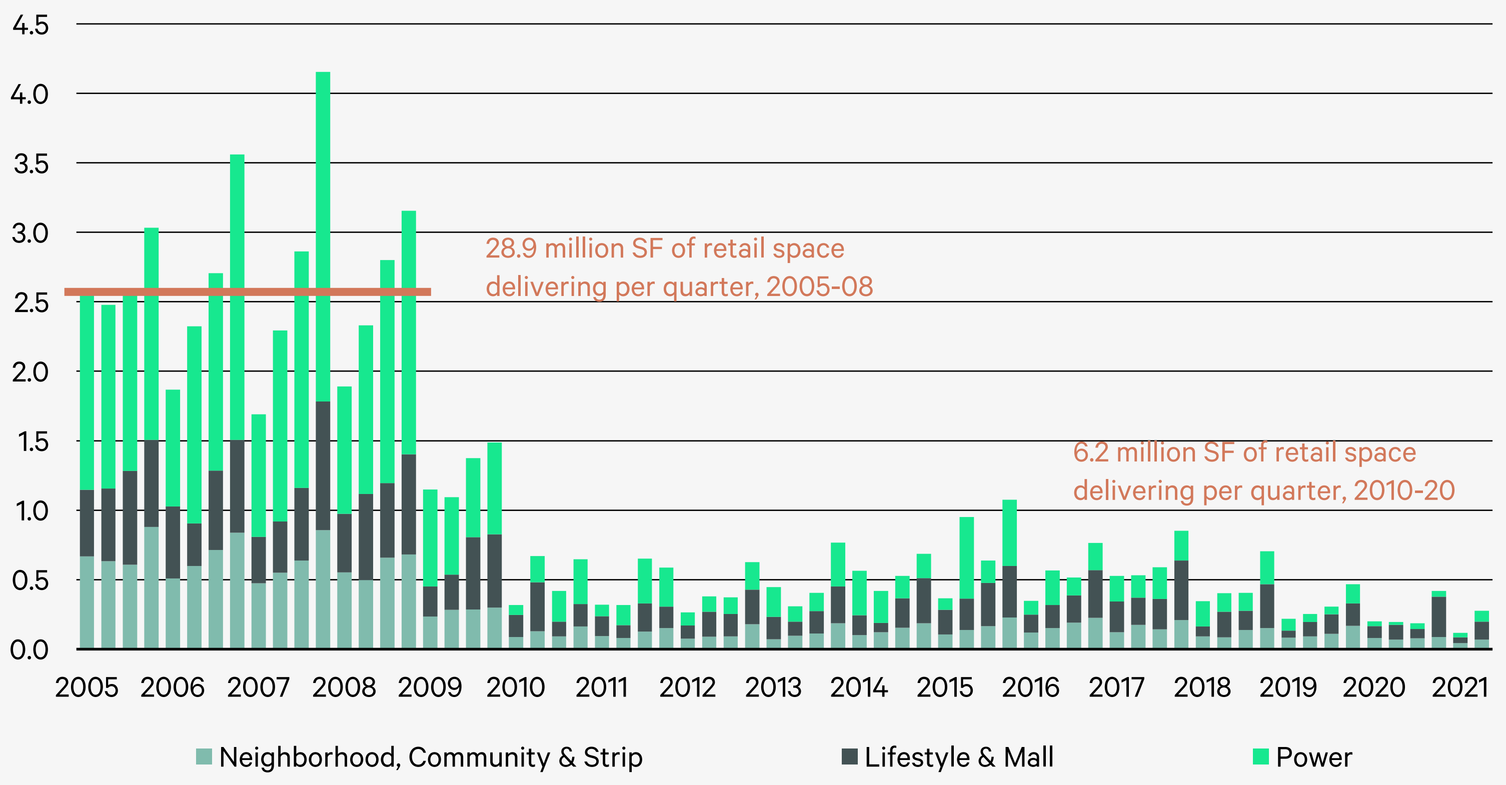
Availability rate by retail center type (%)



CBRE EA.

Retail development will likely remain much lower than previous cycles

Retail completions per quarter, square feet (000s)



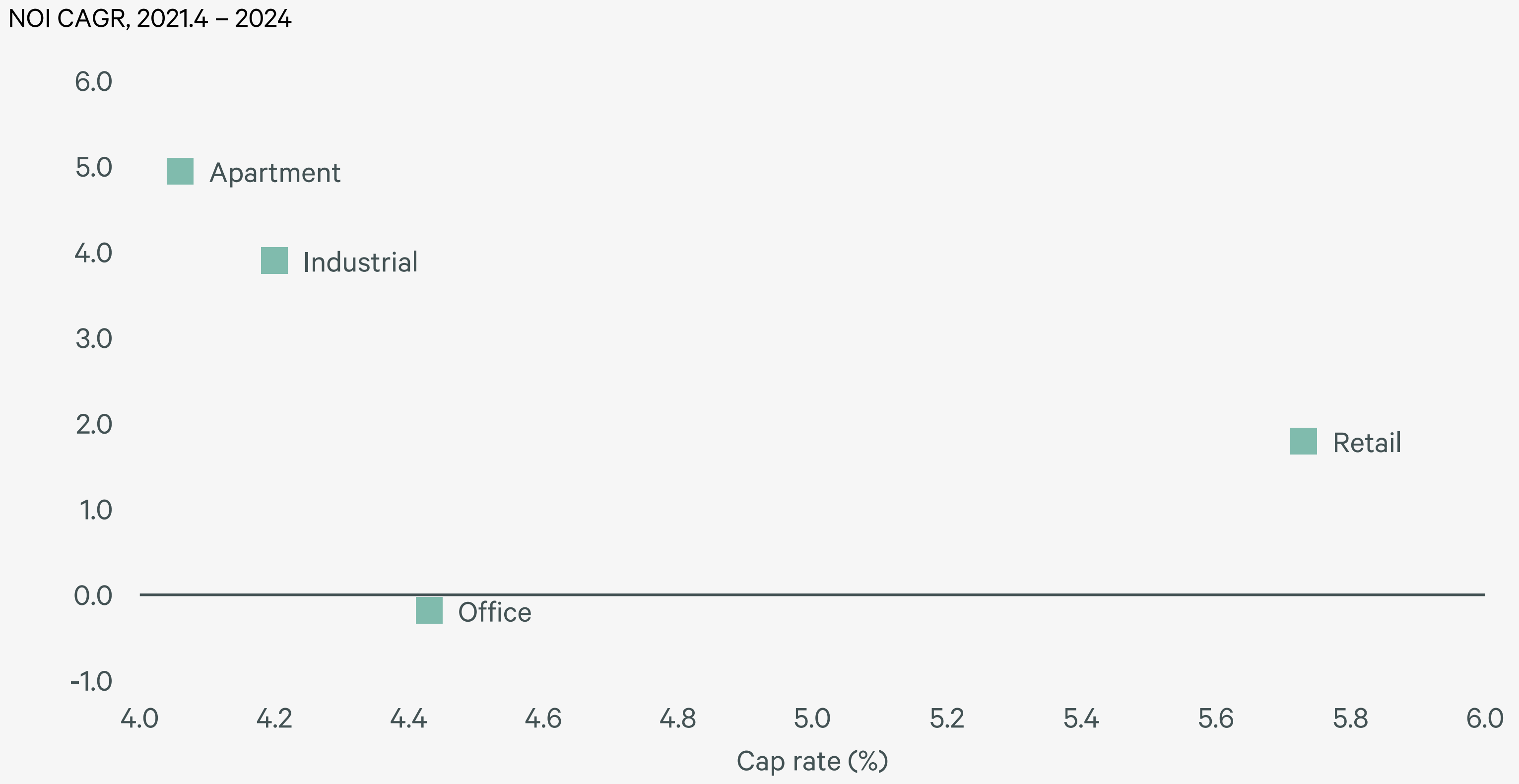
CBRE EA.

There is relative opportunity for the retail sector

- Increased retail sales, including at brick-and-mortar stores, have supported shopping center fundamentals. This has raised the prospects for NOI growth, whilst cap rates remain relatively high.

- The upshot is that some well-positioned retail properties could shine in terms of investment performance.

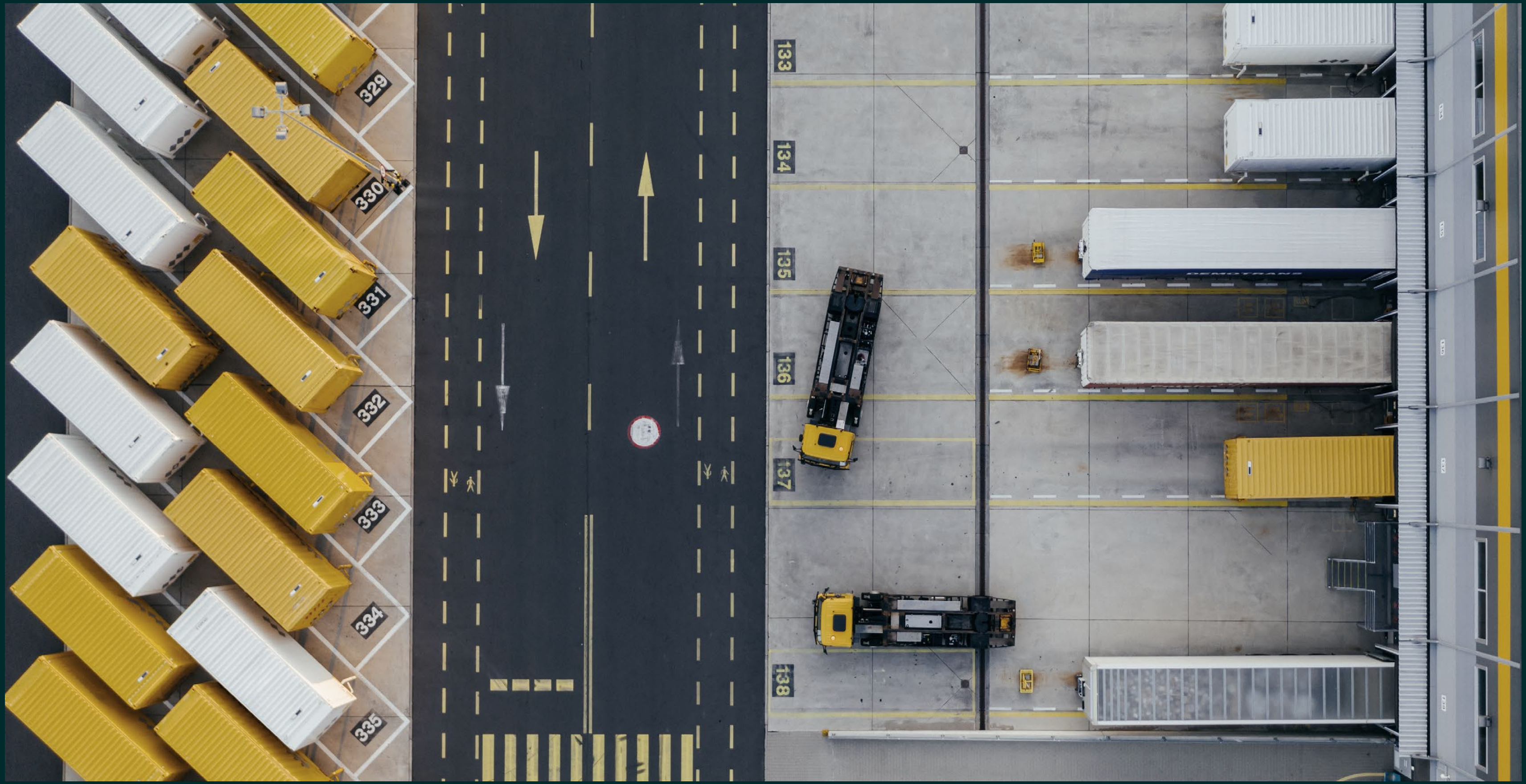
NOI growth outlook relative to pricing



CBRE-EA.

U.S. Industrial

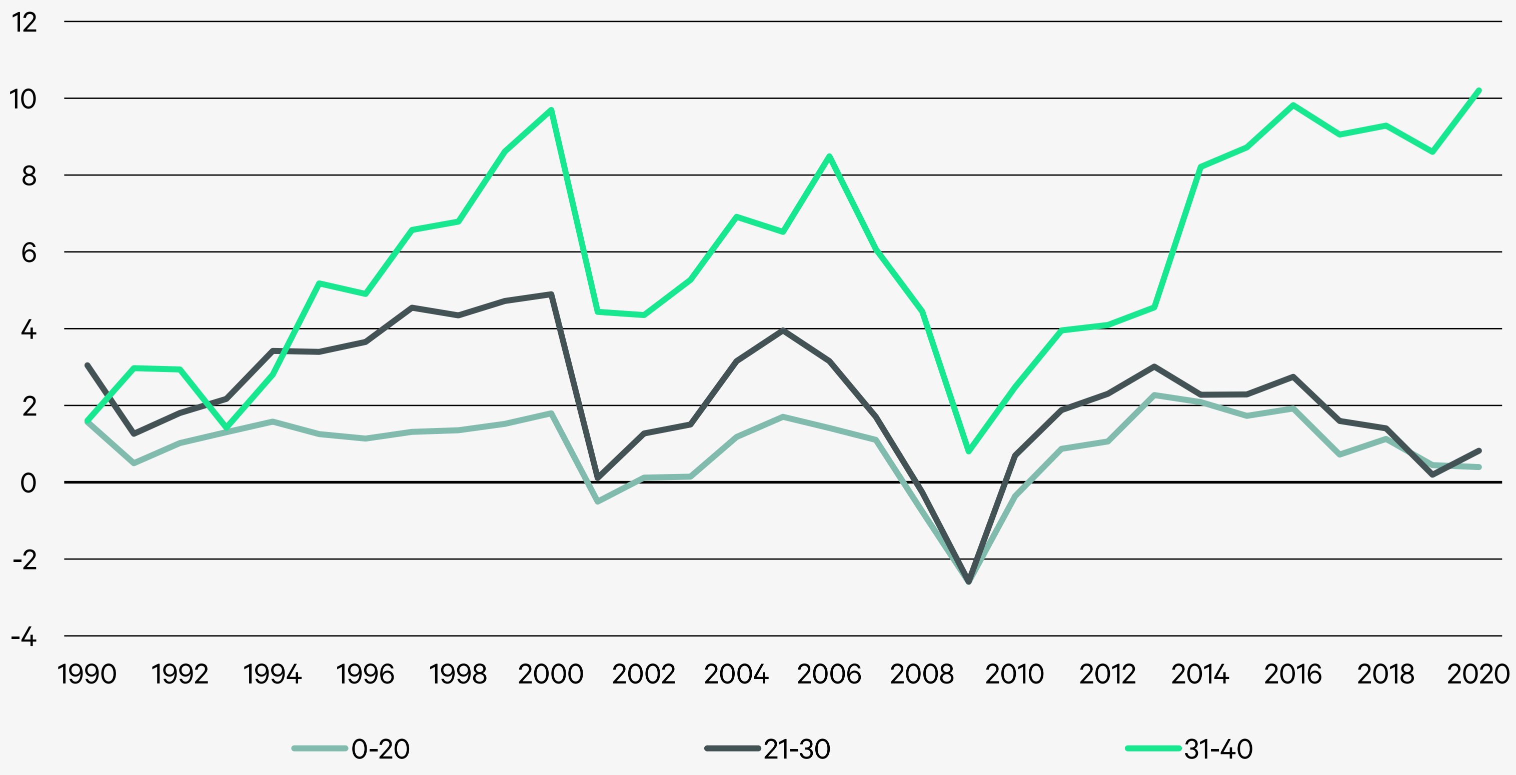
3



Logistics leasing favors modern, high clear-height properties

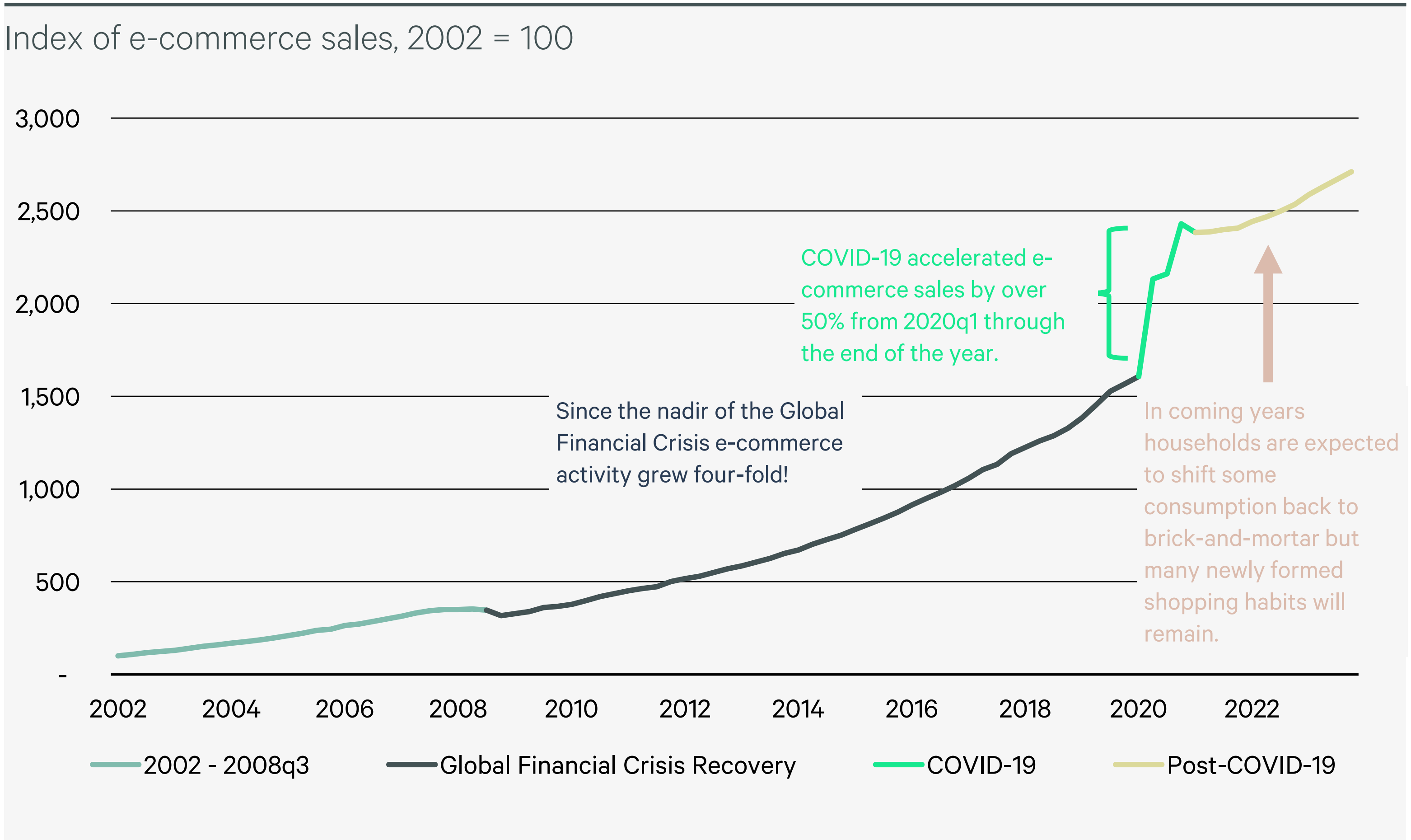
- Much of the leasing has been concentrated in modern space to accommodate very efficient e-commerce platforms.
- Specifically, many of these high clear-height properties are clustered in the nation's largest logistics markets, such as the Inland Empire, Eastern PA and Chicago.

Absorption / inventory by property ceiling height (%)



Source: CBRE EA.

E-commerce growth will slow but will remain much larger post-COVID-19

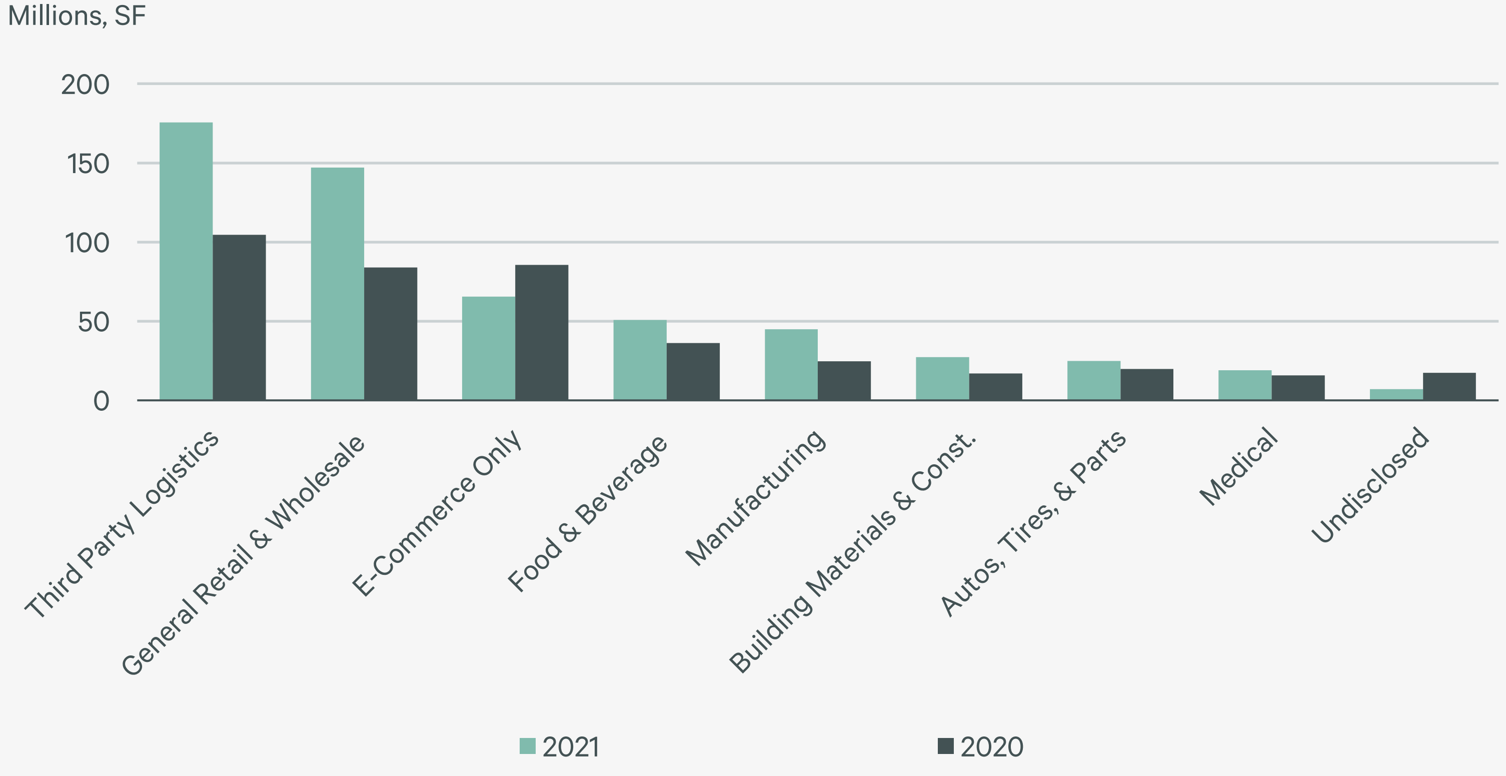


Source: CBRE EA.

The composition of industrial leasing is shifting

- 3PLs account for a greater share of leasing activity, as small retailers are likely outsourcing distribution to overcome space and manpower shortages.
- Meanwhile, e-commerce activity is slowing down. The cause could be that digital sales growth is simply from its epic 2020 pace.
- The e-commerce slowdown could be fueling demand from large brick-and-mortar retailers.

Industrial lease transactions, deals 100,000 SF and above by tenant type



CBRE Americas Research

*Compares new lease and renewal transactions from January through October.

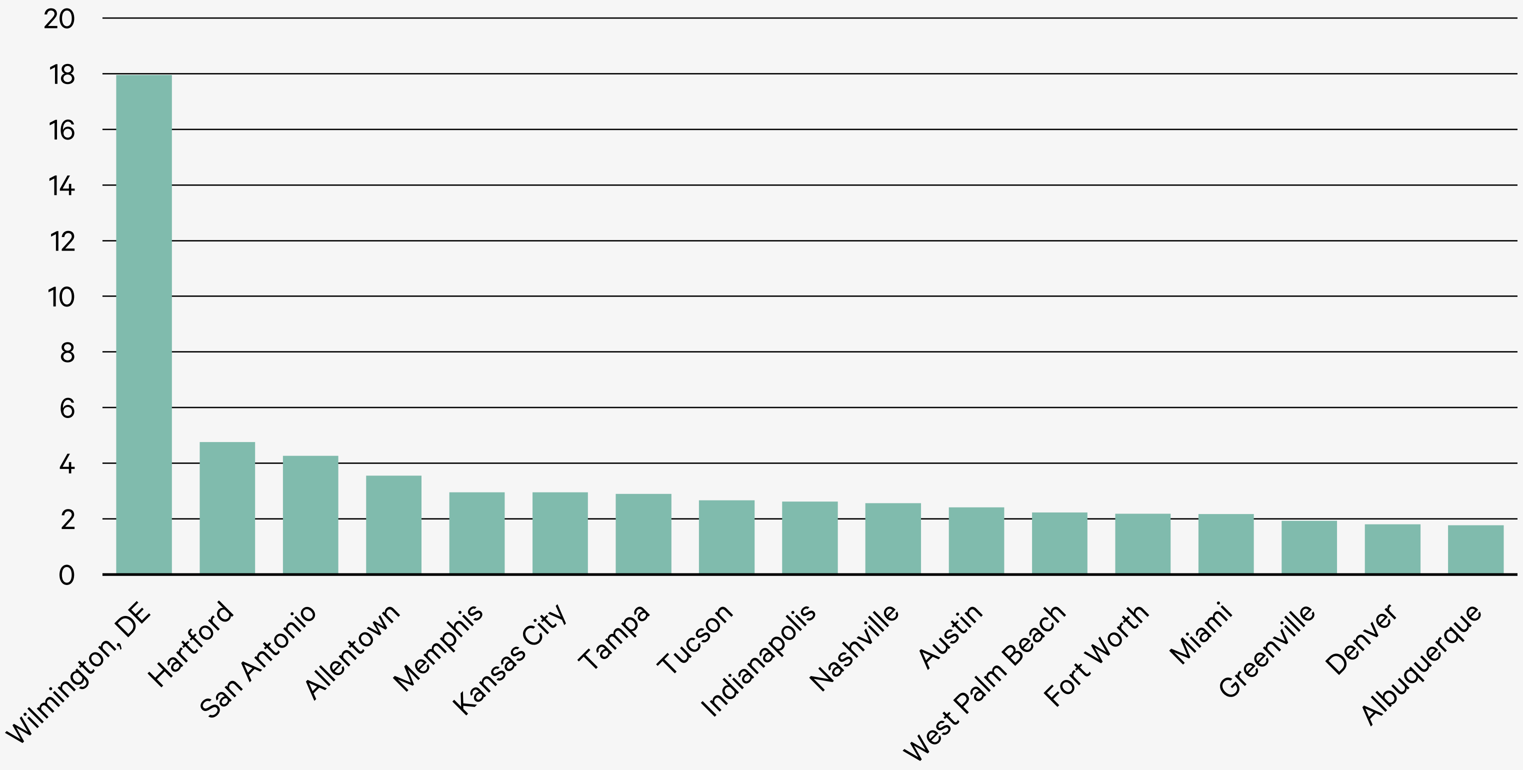
Industrial construction is partly following population growth

- Many smaller industrial markets, such as Austin, San Antonio, and Nashville, are seeing new warehouse product to service a growing population base.

- Meanwhile, major logistics hubs, such as Dallas, Allentown, and Riverside, are also seeing significant inventory growth.

- Wilmington, Delaware has increased activity from a seaport expansion and the development of a large distribution center for a prominent e-commerce company.

Top 20 markets for logistics space is underway as a share of inventory (%)



Source: CBRE EA.

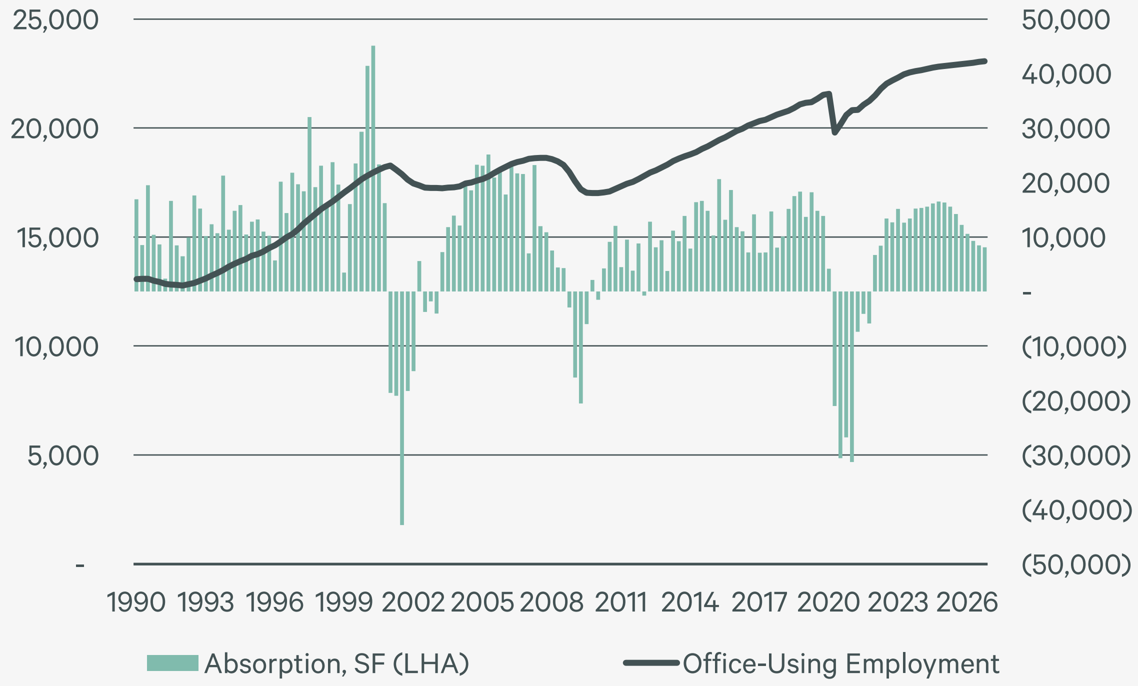
U.S. Office

How virtual work has changed our outlook for office fundamentals

Historic and forecast vacancy rate (%)

CBRE EA.

Office absorption and employment (000s)



CBRE EA.

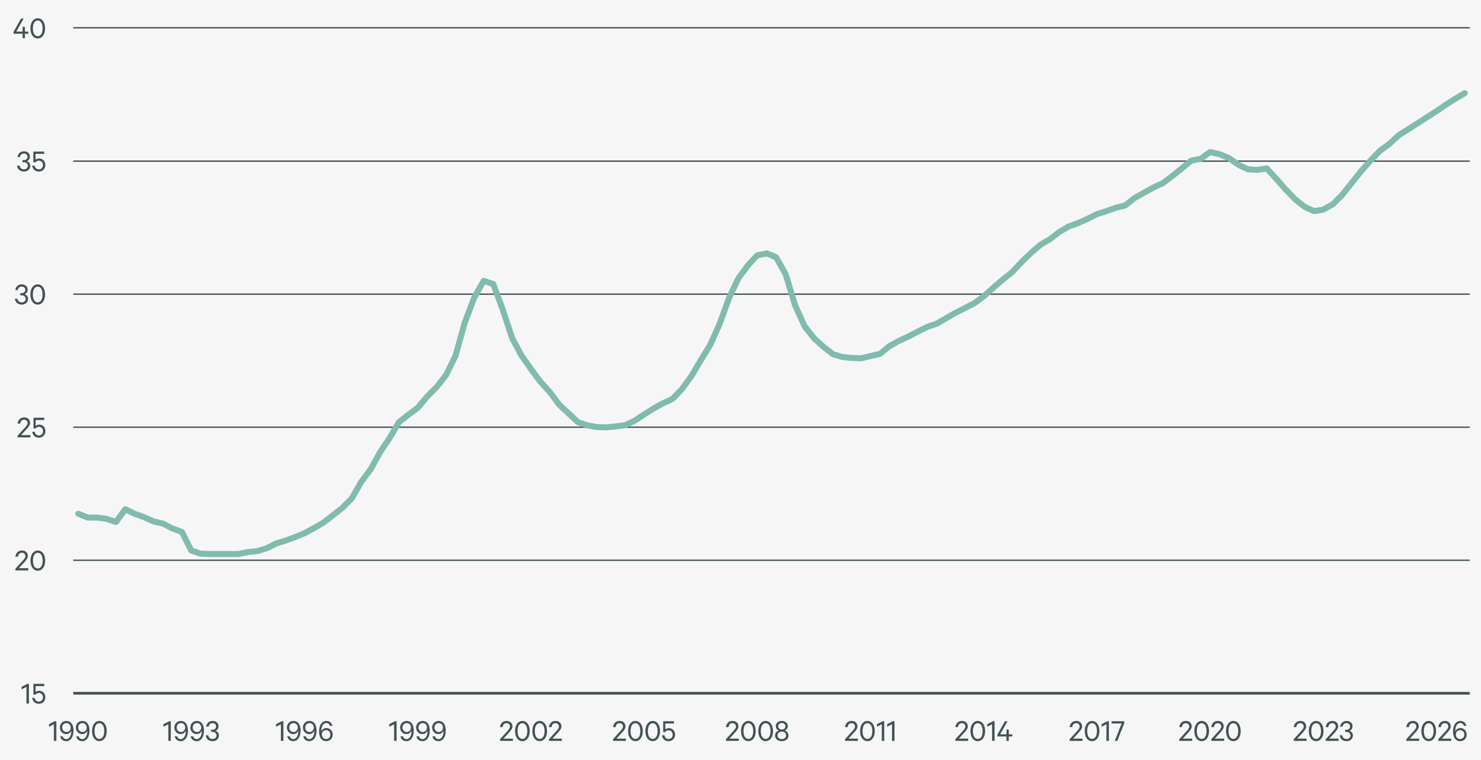
- The adoption of virtual working has changed our view of the market. We believe office workers will spend approximately one-quarter less time at the office, on average. The overall net impact of more virtual work is that 9% less office space will be needed per employee.
- The decisions will play out over time as existing leases expire and office attendance levels are more fully elevated. The impact of virtual working also will be offset by sturdy office-using job creation.

It will be a tenant's market for the next several years

- Overall, we expect gross asking rents to fall by just over 7% as occupiers delay leasing decisions and give space back.

- The recovery in rents should begin by 2022. A full recovery to pre-pandemic rent levels should occur mid 2024.

Estimated EA Asking Rent ($/SF)*

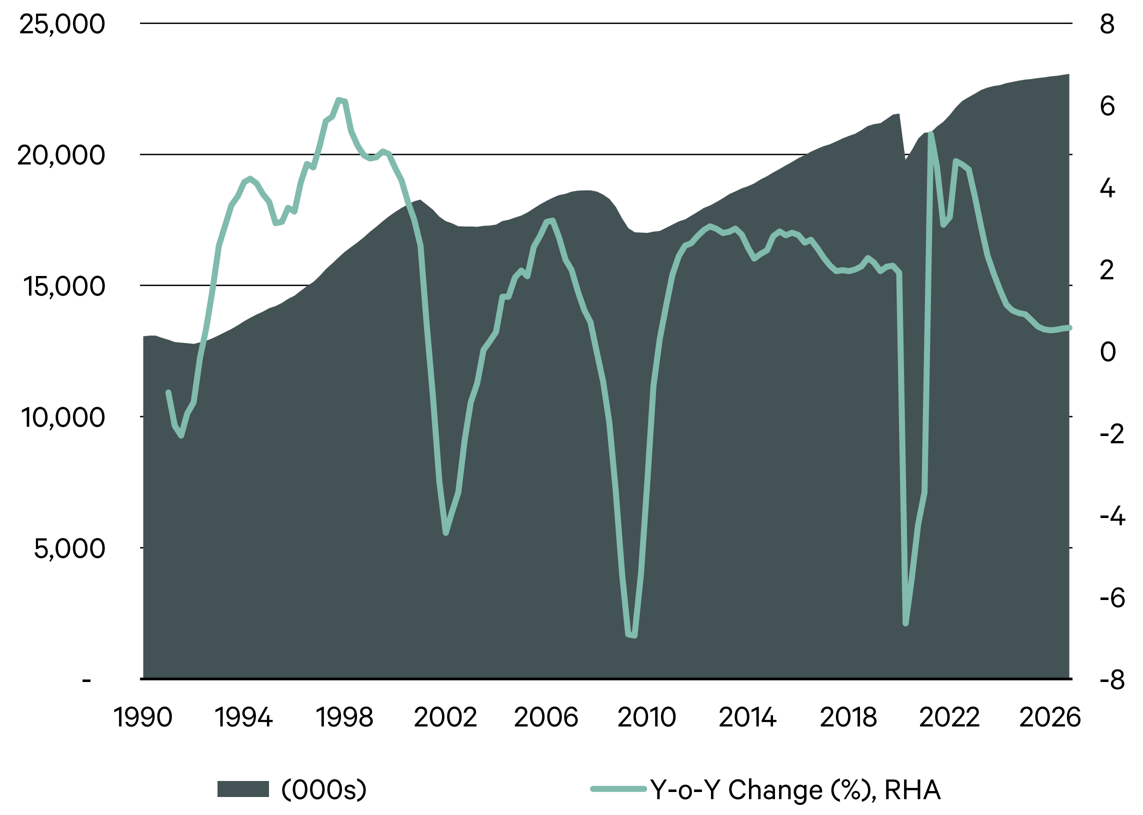


CBRE EA.

Note: EA Asking Rents are new, cutting-edge gross asking rent series that has been developed in partnership with EA co-founder and MIT economist, Bill Wheaton. These estimated rents are based upon a repeat rent method which makes them the most reliable indicator of how rents have changed over time.

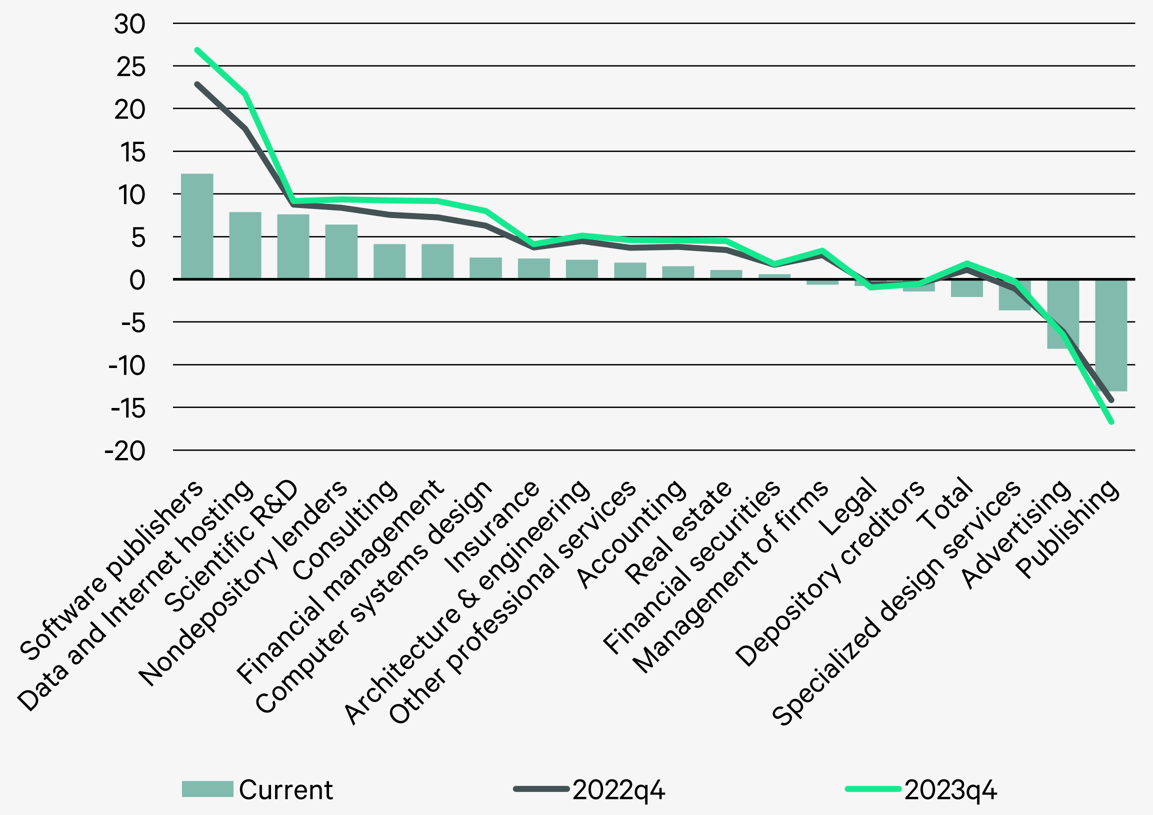
Office-using employment has generally recovered from the pandemic

Office-using employment



U.S. Bureau of Labor Statistics, CBRE EA.

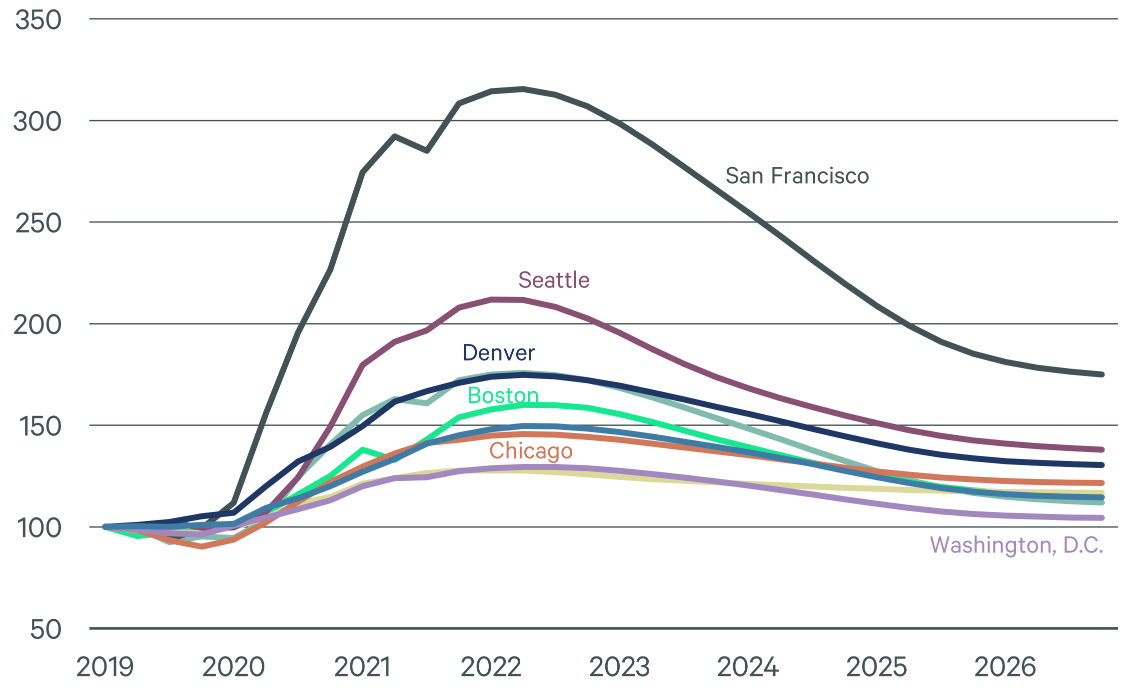
Employment level relative to Q4 2019, percentage difference (%)



Oxford Economics, U.S. Bureau of Labor Statistics, CBRE EA.

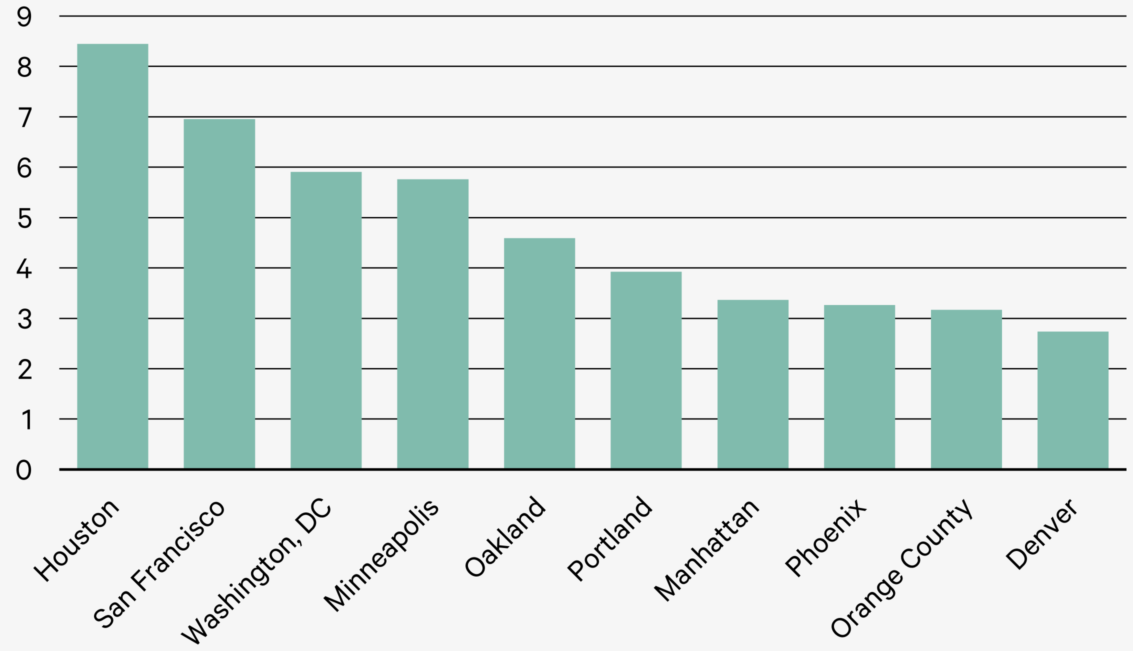
Major markets are not likely to return to pre-pandemic occupancy levels

Vacancy rate index, 2019 Q1 = 100



CBRE EA.

2023 vacancy rate less long-term market average (ppts)

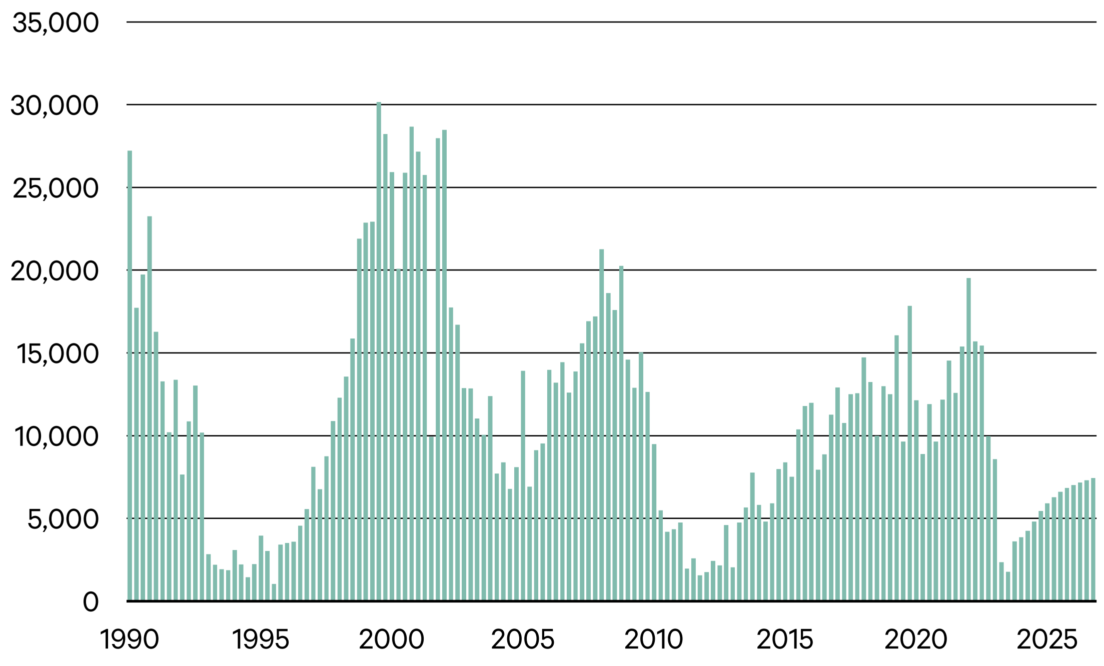


CBRE EA.

- Nationally, the vacancy rate should peak at nearly 18% in 2022. High-cost, high-density cities with a sizable 'start-up' culture (e.g., San Francisco, New York, Seattle) saw a significant uptick in the vacancy rate during 2020.
- Vacancies will remain above long-term average levels for some cities. This includes Houston, which never fully recovered from falling oil prices in 2014-15.

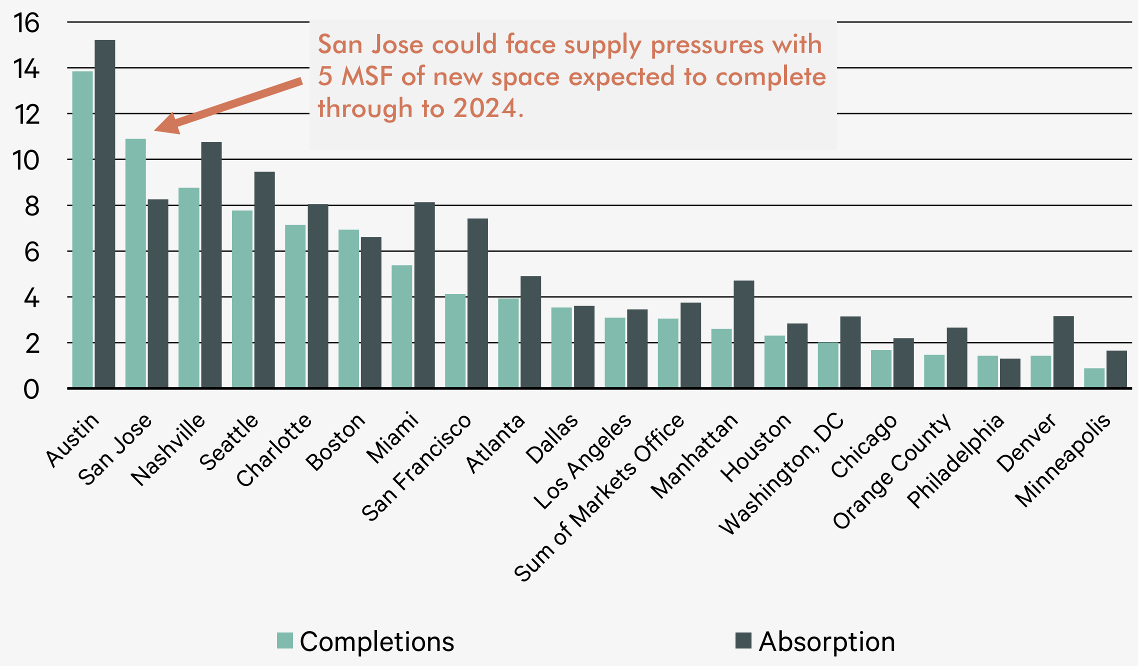
2-year outlook for completions and absorption, major markets

Sum of U.S. markets office completions (000s)



CBRE EA.

Forecast supply and absorption as a % of stock, 2021 -24

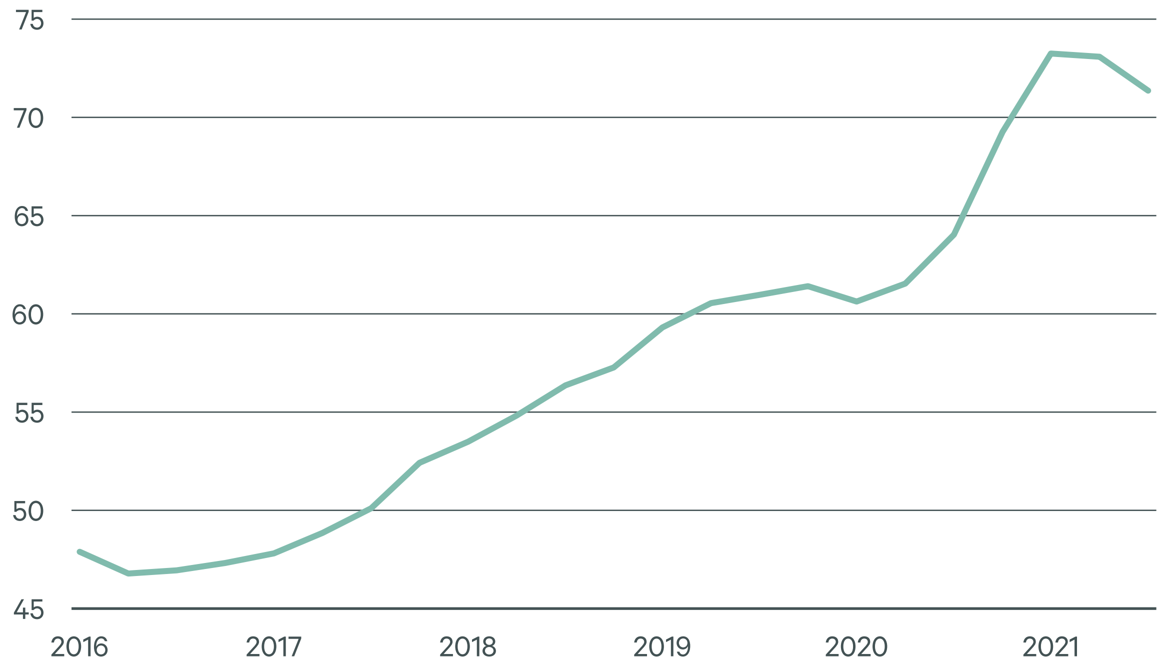


CBRE EA.

- Although the supply pipeline is presently full, future supply cycles will likely be much less than in the past.
- Most markets are poised to see greater absorption than supply going forward. Major tech markets (e.g., Boston and San Jose) are key exceptions.

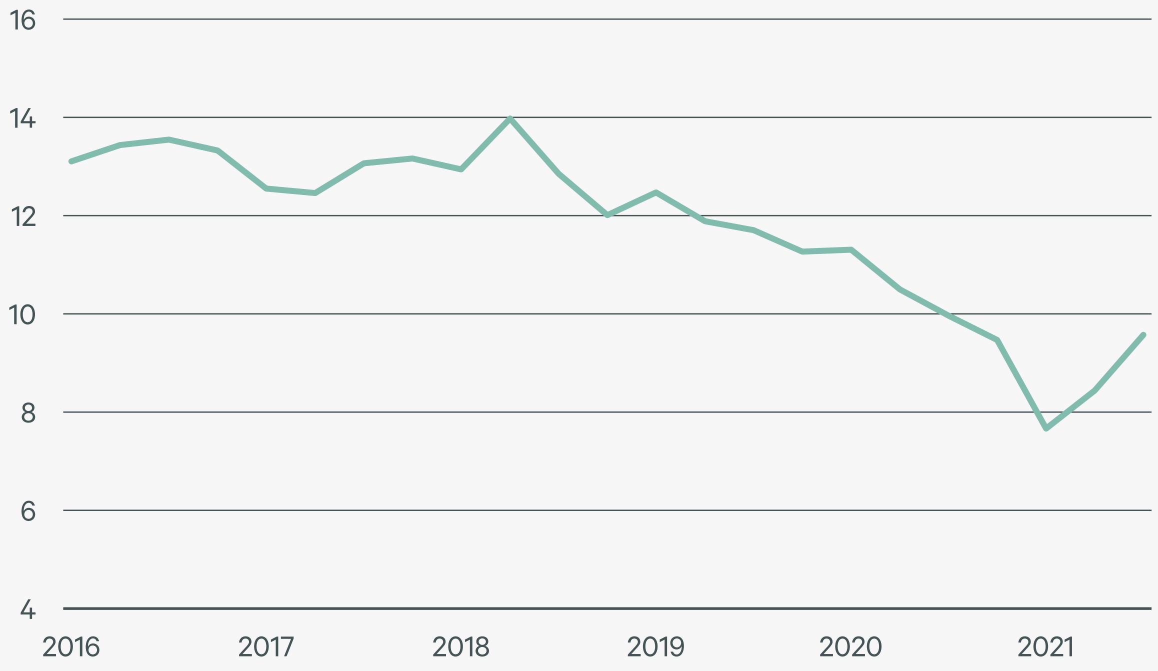
The office investment focus is on high-quality properties

Share of offices sold that are fully occupied (%)



Real Capital Analytics, CBRE EA.

Share of offices sold that are 40% - 80% occupied

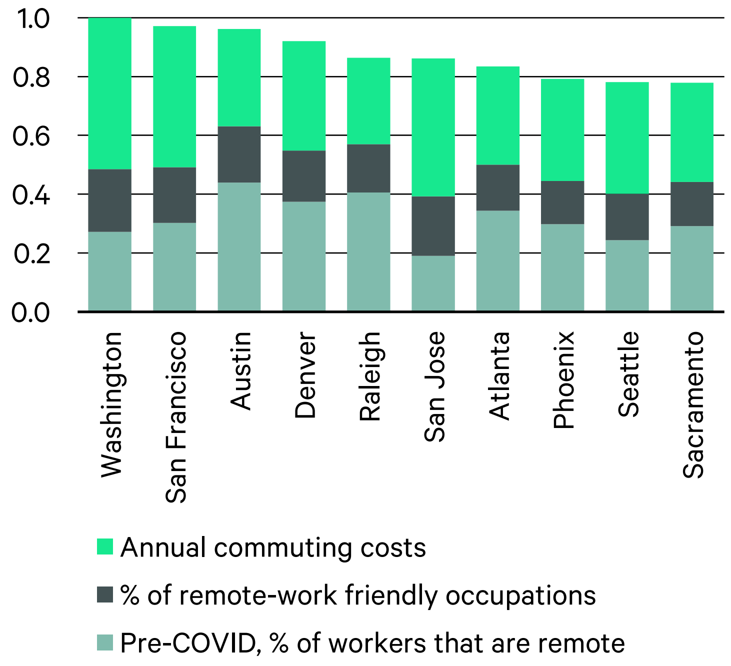


Real Capital Analytics, CBRE EA.

- As the concern surrounding virtual work is paramount investors have shown a clear preference for fully occupied office properties.
- In recent months there has been more appetite for value-add or opportunistic investments but the investment market for office vacancy remains thin.

How the virtual work trend could vary across office markets

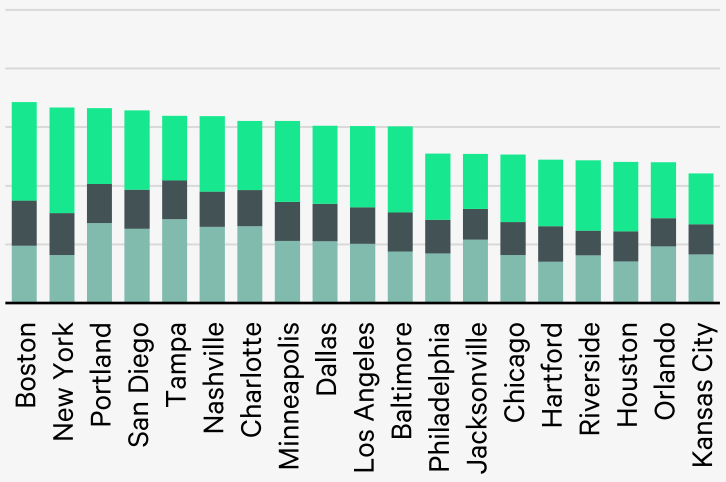
Greatest prevalence of virtual work



- ‘Digital’ markets are poised to see more virtual work.
- Cities with high in-migration historically saw many newcomers work virtually.

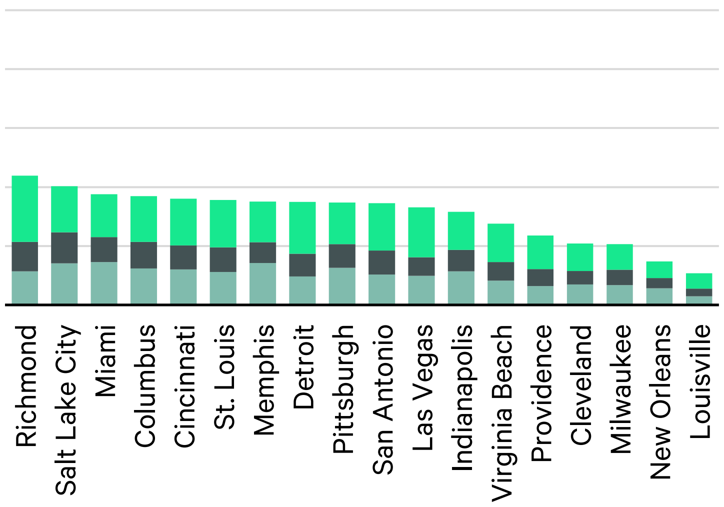
NOTE: Many high-performing office markets have a legacy of virtual work.

Moderate prevalence



- Many cities, such as New York and Los Angeles, with sizable creative and transactional sectors, will need office/meeting space.
- Medium-sized Sunbelt cities with shorter commute times offer easier access to the office.

Less prevalence



- High-tech sectors are less prevalent in the Midwest, limiting the propensity for virtual work.
- More manageable commute times encourage consistent office attendance.

U.S. Census Bureau, University of Chicago, Clever, CBRE EA.

U.S. Multifamily

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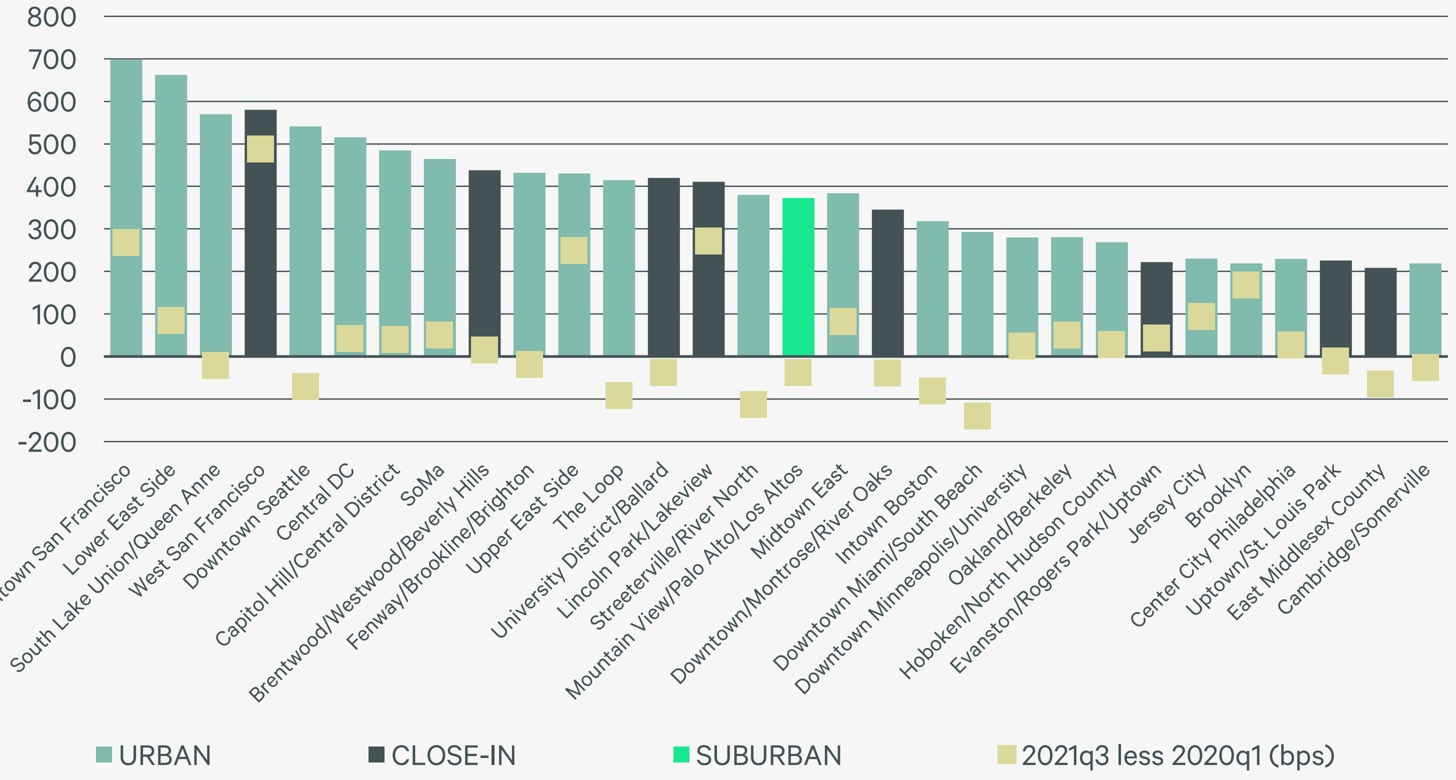
The urban apartment recovery is well under way!

- Most of the hardest-hit submarkets from the pandemic were urban in nature or were adjacent to urban cores.

- As social distancing rules have been relaxed and vaccines deployed, people have been moving back to urban neighborhoods. This is evidenced by vacancy rates generally falling back from their 2020 peaks.

Change in vacancy rates from Q1 2020 (basis points)



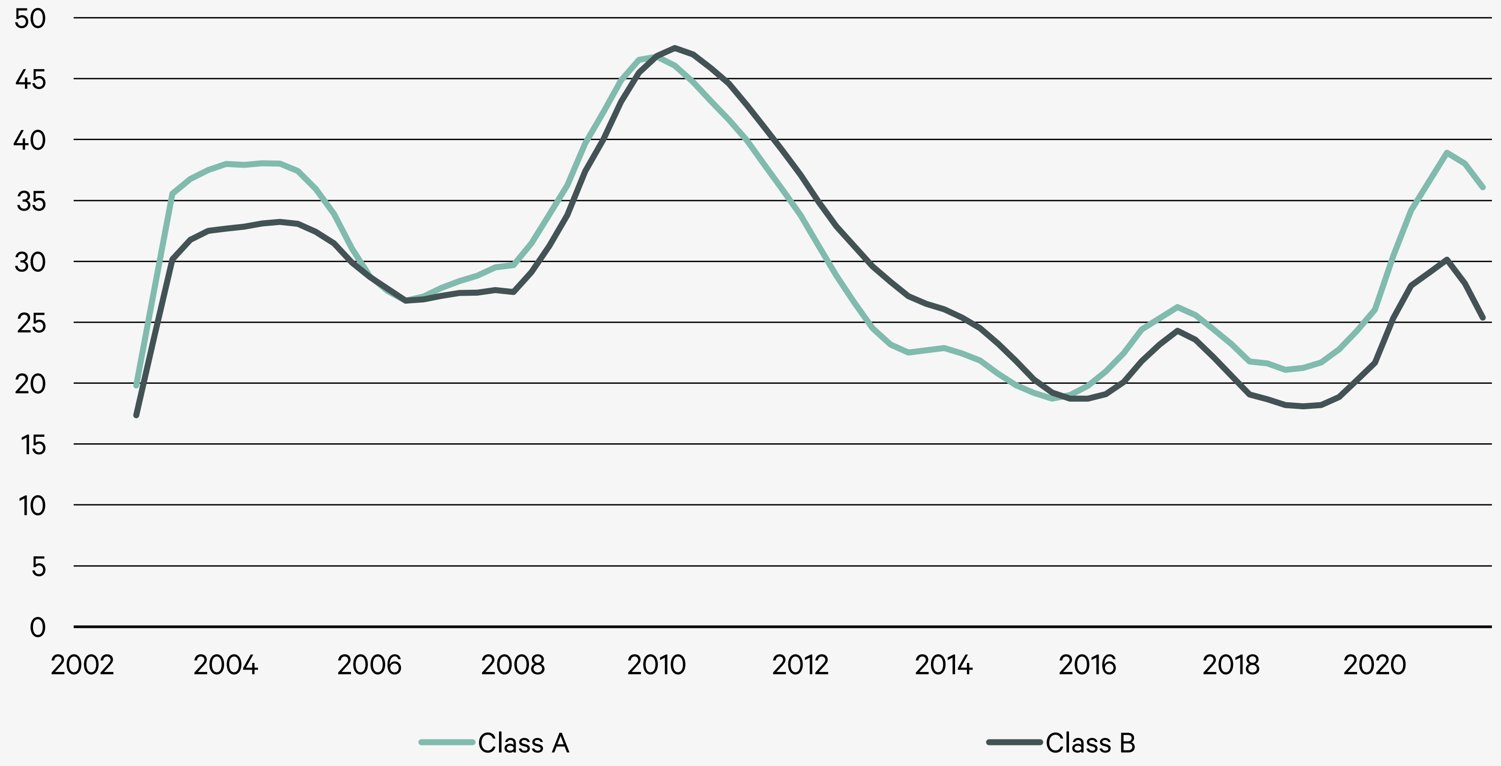
CBRE EA.

Value-oriented, 'Class B' apartments are holding up better than 'Class A'

- Class A apartment fundamentals have softened, due to new supply and move-outs amongst more mobile, affluent tenants during the pandemic.

- Class B landlords have greater leverage as there are fewer deliveries of 'value-oriented' rentals and Class B tenants are less likely to move out for homeownership.

% of properties offering discounts by class



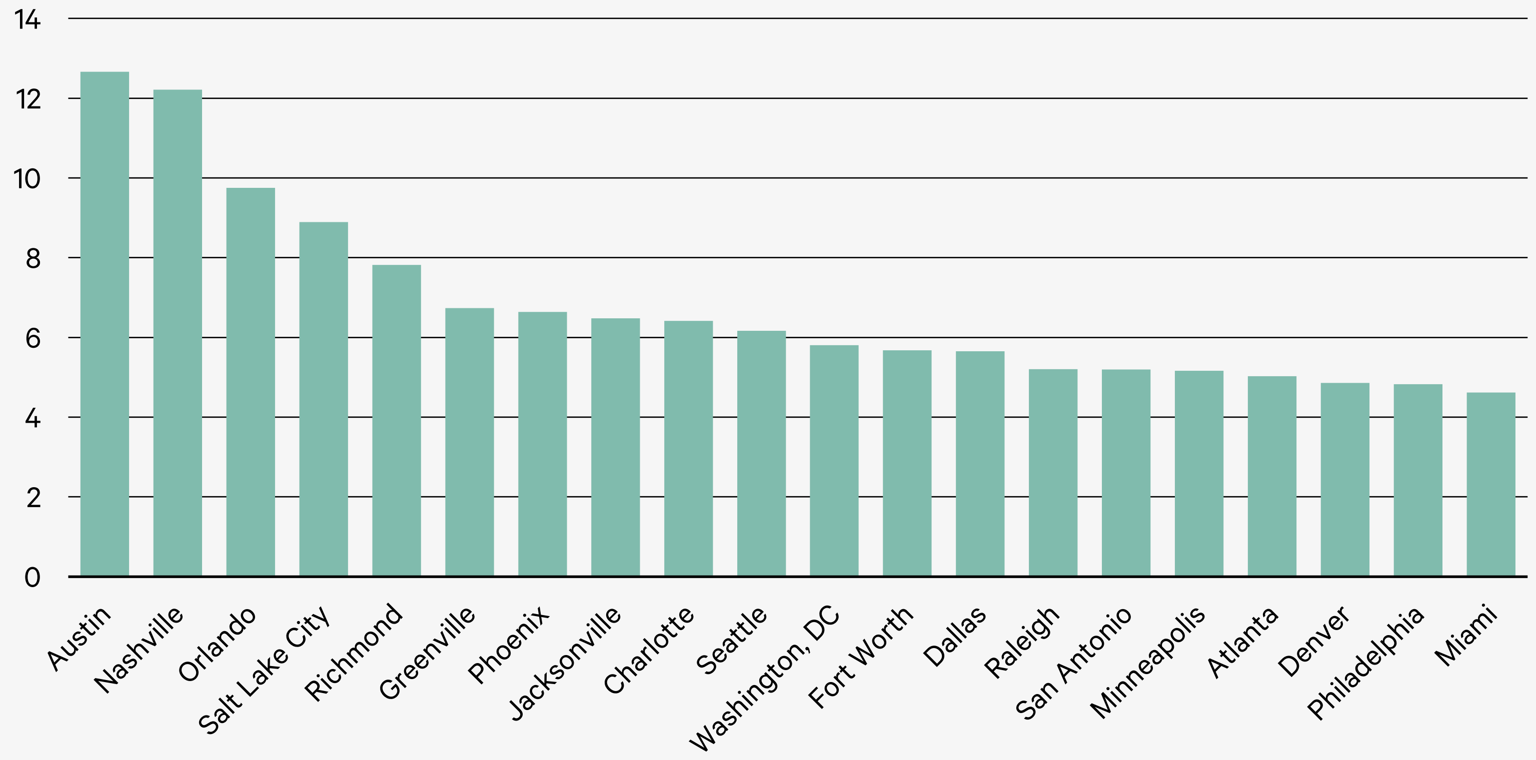
CBRE EA

Apartment development generally follows population growth

- Like other real estate sectors, the pace of multifamily development in Austin exceeds other marketplaces.

- A large share of this product will deliver in more urbanized submarkets that have, on balance, fallen out of favor during the pandemic.

Top 20 markets for apartment units underway as a share of inventory (%)



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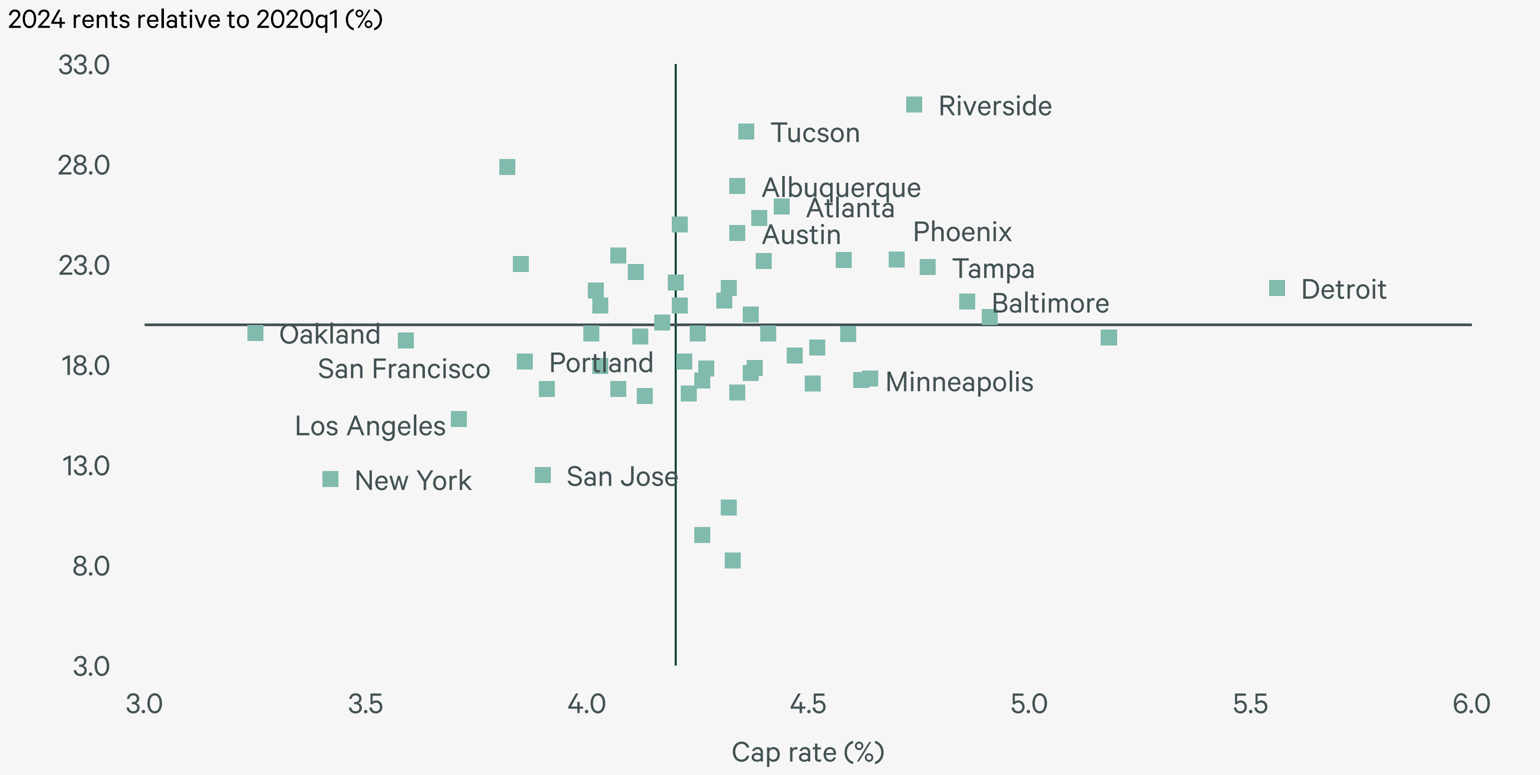
There is opportunity in the Sunbelt

- Yields are relatively high in markets that are poised to see the greatest expansion in rents since early 2020.

- Traditionally stable and low-yielding markets will see a notable rent roll-up; however, not as much as more 'interior' cities. Further, some coastal, low-yielding markets face the prospect of rent control legislation.

Apartment rent roll relative to yields



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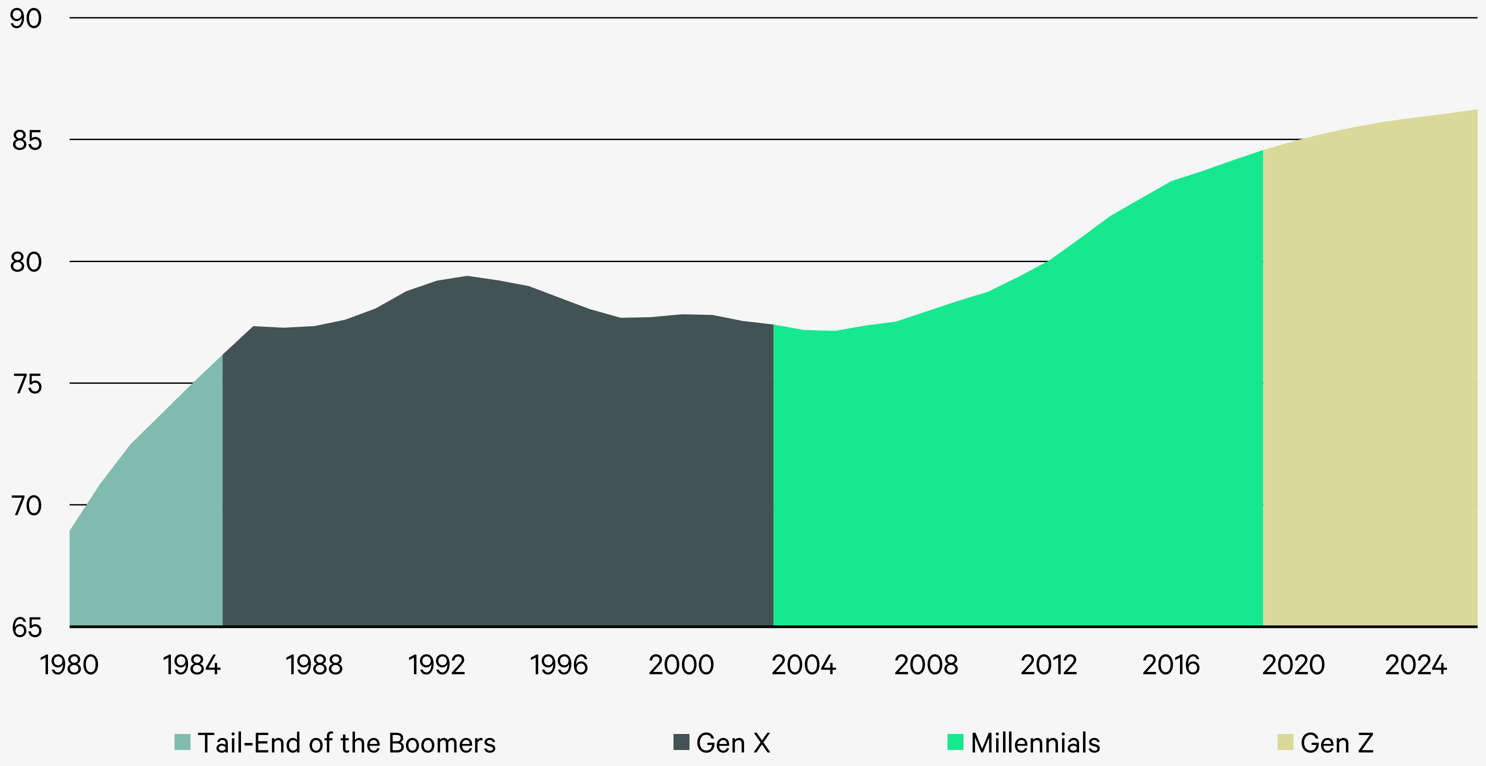
Demographic tailwinds are fading

- Apartments benefitted from a wave of people moving into young adulthood during the past decade; this trend is over.
- Although the traditional apartment renting demographic is growing at a slower pace, very low for-sale affordability is poised to keep people renting for longer.

Total population aged 20-39 (millions)



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