INVESTMENT RESEARCH

QUARTERLY INSIGHTS

With the worst of the property correction behind us, we're focusing more on the strength and timing of the recovery. As always, this is tricky to answer. To be sure, we face sector challenges around demand (think offices) and supply (think logistics). But we also face growing challenges by location as city dynamics start to matter more than they have for a long time.

In PGIM Real Estate's latest Quarterly Insights, our regional research teams focus on the following themes and opportunities:

ASIA PACIFIC

Key Themes

- How Office Affordability Analysis Improves Forecasting
- Why Asia Pacific Rental Growth Might Prove to Be Stronger Than Expected

How Office Affordability Analysis Improves Forecasting

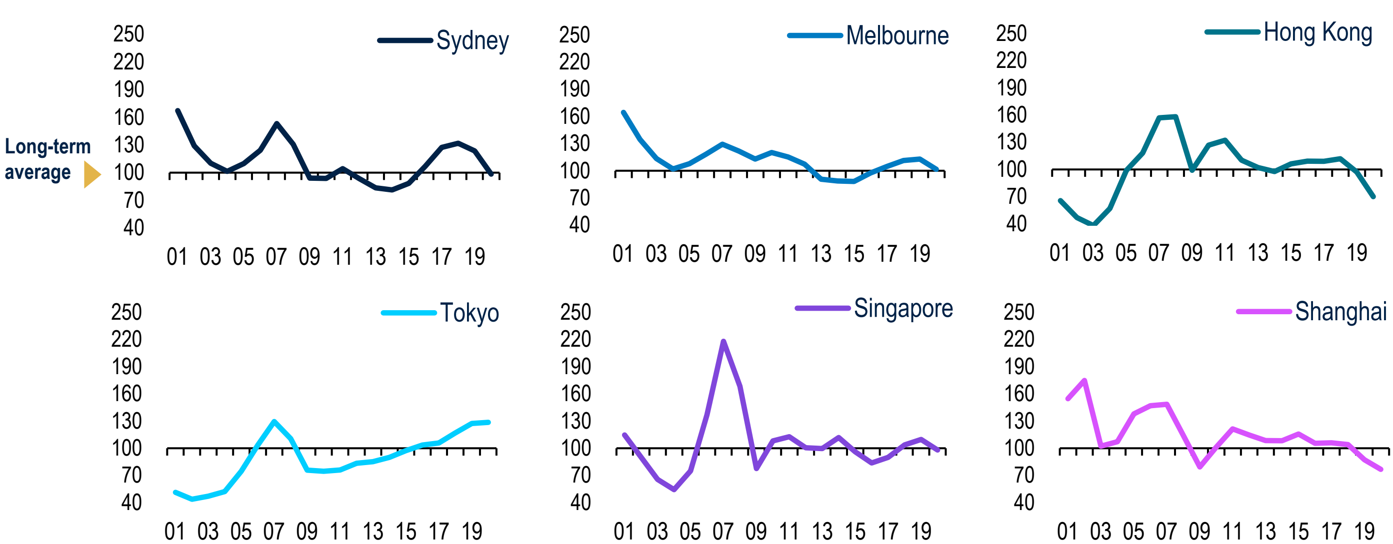
In early 2021, our Quarterly Insight (QI) looked at how office affordability measures might help us improve our understanding of rental growth. Too often forecasts can get hung up on growth and vacancy rates without considering other factors such as how much a tenant is willing or able to pay.

The thinking here is intuitive – the more (less) profitable a space is to occupiers, the more able and willing they are to pay more (less) rent.

So, does looking at occupier affordability improve our outlook for markets?

Exhibit 1: CBD Prime Office Rent Affordability Index, 2001-20

Office Rent Affordability Index (Neutral = 100; >100 = Less Affordable, <100=More Affordable)



Sources: JLL, Oxford Economics, PGIM Real Estate. As of February 2024.

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For that we go back to our analysis in 2021, in which affordability is measured as office output per square meter (psm) of occupied space relative to rent. We assume the more output produced relative to rent, the more affordable the space becomes and the more able landlords are to raise rents and vice versa.

In **Exhibit 1**, our measure of office affordability, given as an index, is plotted on a year-over-year basis for each of a number of major CBD office markets. The long-term average or neutral rate is 100. When the affordability index (Index) falls below the neutral rate, occupier affordability is improving, and when above it is deteriorating.

Exhibit 1 highlights that in 2020 all markets other than Tokyo reported improving affordability. To be fair, Melbourne remained above the estimated neutral rate – reporting slightly lower occupier affordability – whilst Sydney and Singapore both fell just below the line.

A simple interpretation of the Index suggested that for 2021 there was a risk that rental growth would be better than expected in all markets other than Tokyo and Melbourne because office affordability had fallen so much. For Tokyo and Melbourne, the risk was that rental growth would do worse than expected.

What actually happened is shown in **Exhibits 2a and 2b.**

In all cases, the Index correctly flagged the risks to the forecasts. So what does this mean for 2024?

Exhibit 2a: Comparing the Forecasts and the Outcome for Annual Change in Net Effective Rents for Major CBD Office Markets, 2021 (% p.a.)

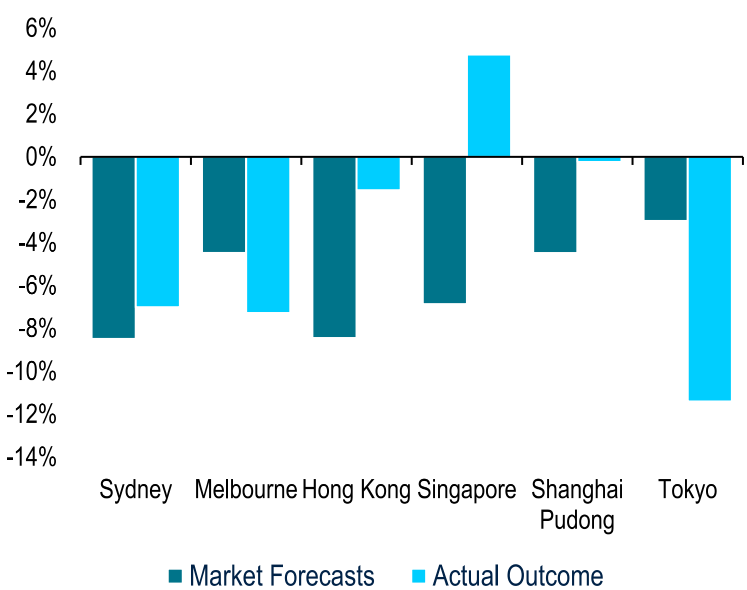


Exhibit 2b: Comparing AI Risks to the Outcomes

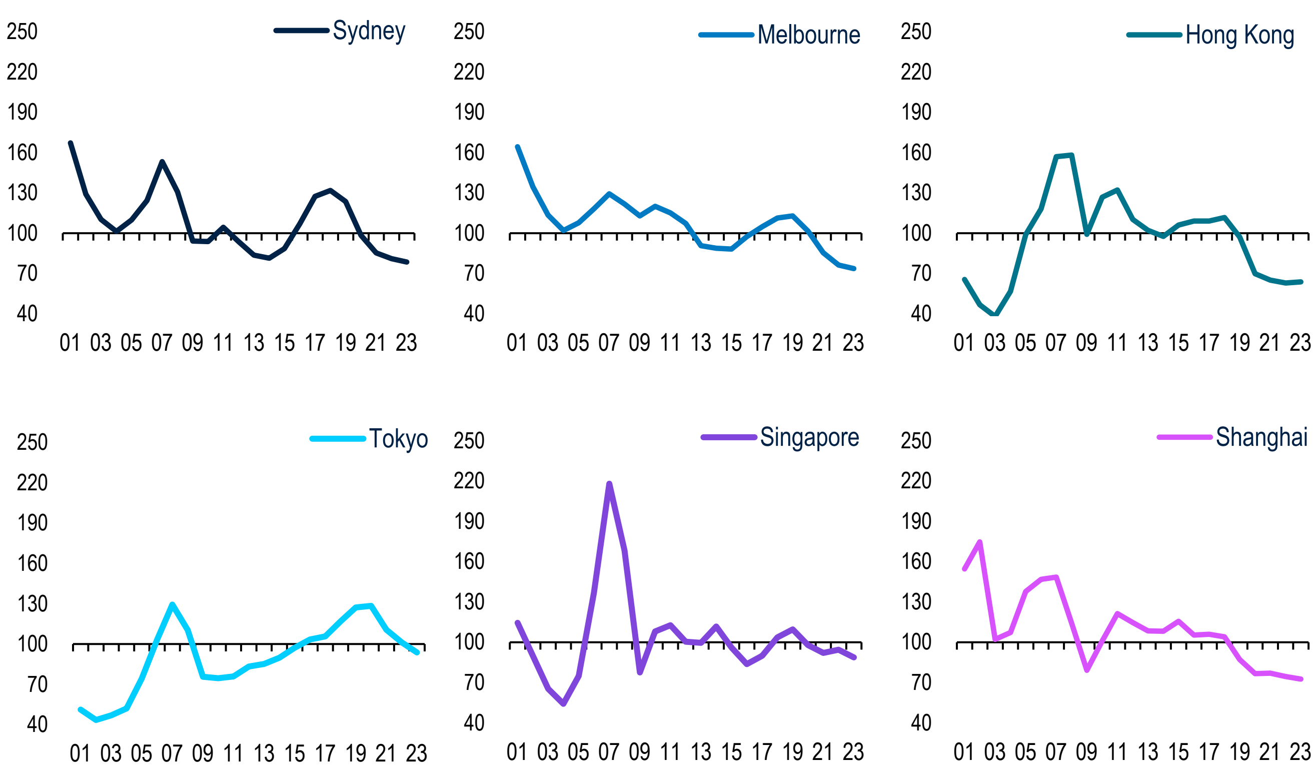
CBD Office Market	AI Signal: Risks to Forecasts	Result: Outcome vs. Forecasts
Sydney	Better	Better
Melbourne	Worse	Worse
Hong Kong	Better	Better
Singapore	Better	Better
Shanghai	Better	Better
Tokyo	Worse	Worse

Sources: JLL, Oxford Economics, PGIM Real Estate. As of February 2024.

Repeating the exercise for 2024 does bring its own challenges, of course. The risks to rental growth forecasts are now more complicated – this is not only about supply, vacancy, jobs growth and so on, but also now about office utilization trends as well, which is not yet a settled issue.

Nonetheless, **Exhibit 3** illustrates that as of end-2023 all CBD office markets are now more affordable for occupiers than the neutral rate. In each case this points to risks that rental growth forecasts are too negative and actual rental growth in 2024 will prove to be stronger than expected.

Exhibit 3: Office Rent Affordability Index (Neutral = 100; >100 = Less Affordable, <100=More Affordable)

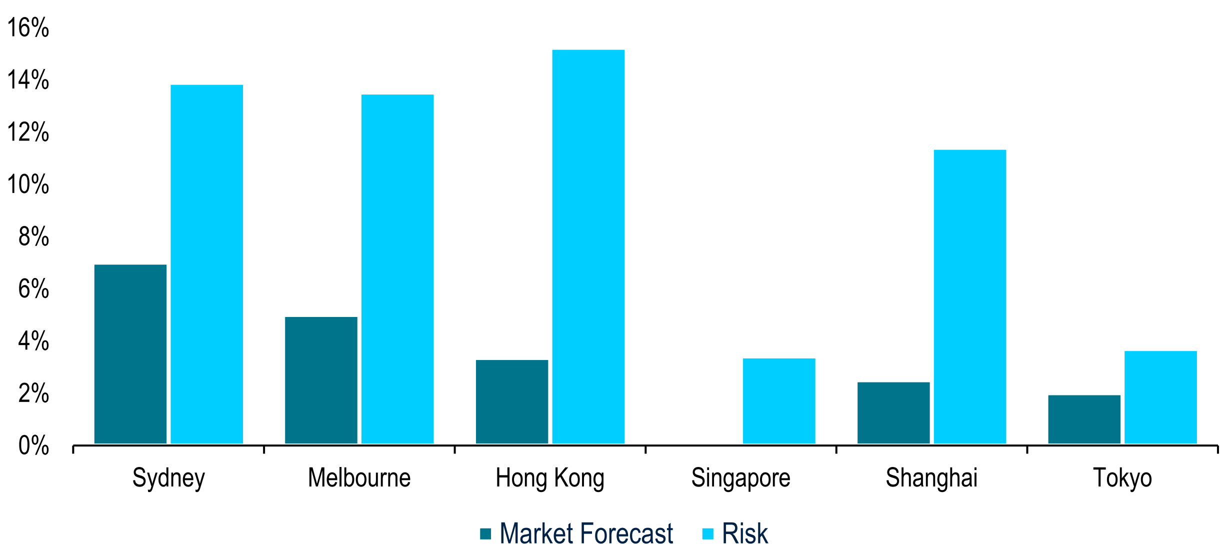


Sources: JLL, Oxford Economics, PGIM Real Estate. As of February 2024.

If we use the relationship between the Index and the forecast errors in 2021 and apply that to our 2024 forecasts, we can estimate by how much our rental growth forecasts might be wrong. **Exhibit 4** compares our net effective rental growth forecast against the estimated risk to those forecasts for the six CBD office markets.

In magnitude, the estimated risks to the forecasts look too high given current market dynamics. Nonetheless, the Index might still be of value by flagging where the forecast errors are the largest. Here Hong Kong looks to be the most under-rated for rental growth. By contrast, Singapore and Tokyo look the least risky.

Exhibit 4: Prime CBD Office Markets, Net Effective Nominal Rental Growth Forecasts vs. Estimated Risks to Those Forecasts, 2024 (% p.a.)

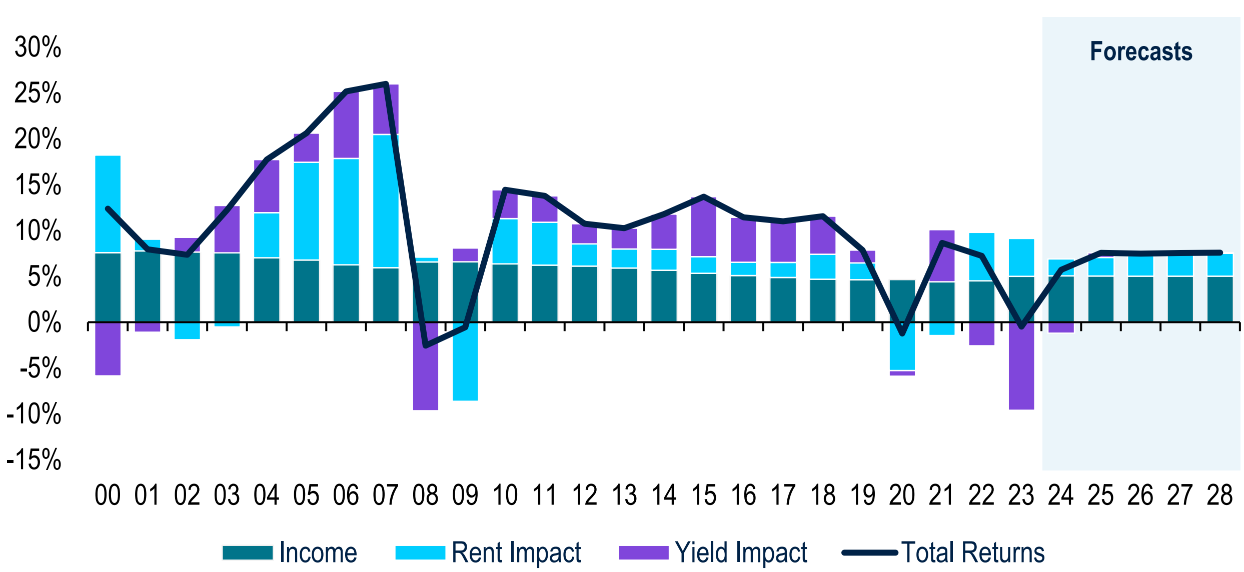


Sources: JLL, PGIM Real Estate. As of February 2024.

Why Asia Pacific Rental Growth Might Prove to Be Stronger Than Expected

As with real estate markets across the world, the prime market returns outlook for major Asia Pacific markets speaks more to rental growth than yield shift – after all, we're not expecting a world in which interest rates fall back to near 0%. And yet the rental growth story does not look that spectacular (see **Exhibit 5**). In part there is an averaging effect going on – there are wide variations in performance expected. For instance, in Japan there is pressure on returns from expectations of cap rates moving out, whilst in Australia pricing and occupier fundamentals look near ready for a recovery. But it is also because across the region economic growth is forecast to continue to slow in line with weak demographic, poor fiscal and slower productivity growth pressures.

Exhibit 5: Estimated Unlevered All Property Prime Market Returns, Major Developed Cities (% p.a.)

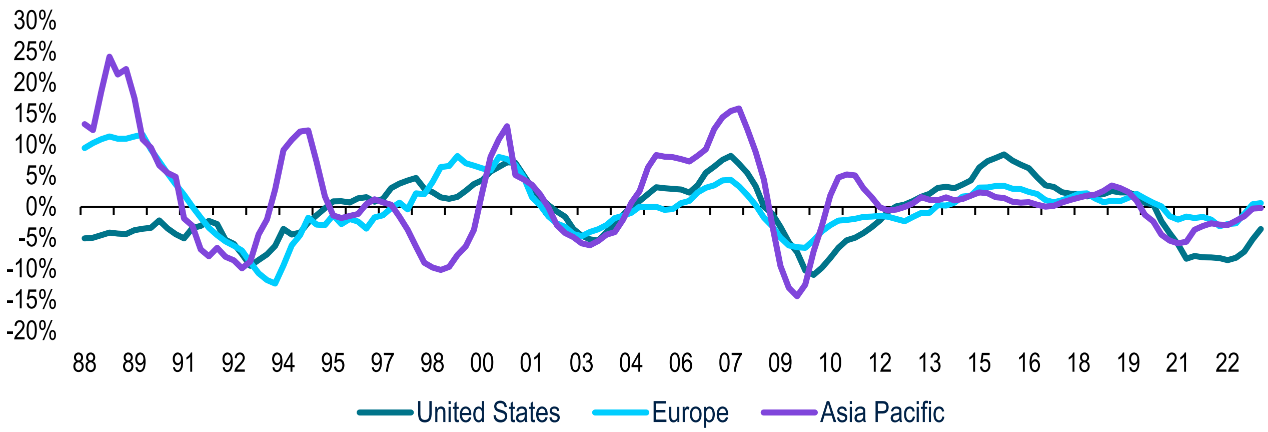


Sources: JLL, PGIM Real Estate. As of February 2024.
Forecasts are not guaranteed and may not be a reliable indicator of future results.

This outlook is at odds with history. As shown in **Exhibit 6**, in previous recoveries Asia Pacific markets generated strong real rental growth, especially so when compared with Europe and the United States. And whilst this can be linked to the faster pace in which the Asia Pacific economies grow, it is arguably down to the importance of productivity in driving this economic growth. Productivity growth is more cyclical than jobs growth, and this then gives rise to faster economic growth into a recovery. In turn, this feeds into faster rental growth.

For Asia Pacific, the relationship between jobs, productivity and rental growth is apparent at the city level. **Exhibits 7a and 7b** show that the pass through – at the city level – from productivity to real rental growth is stronger than with employment.

Exhibit 6: Grade A/Prime Real Rental Growth by Major Real Estate Regions (% p.a.)



Sources: JLL, PMA, CoStar, PGIM Real Estate. As of February 2024.

Exhibit 7a: Average City Employment Growth vs. City All Property Prime Real Rental Growth, 2001-23 (% p.a.)

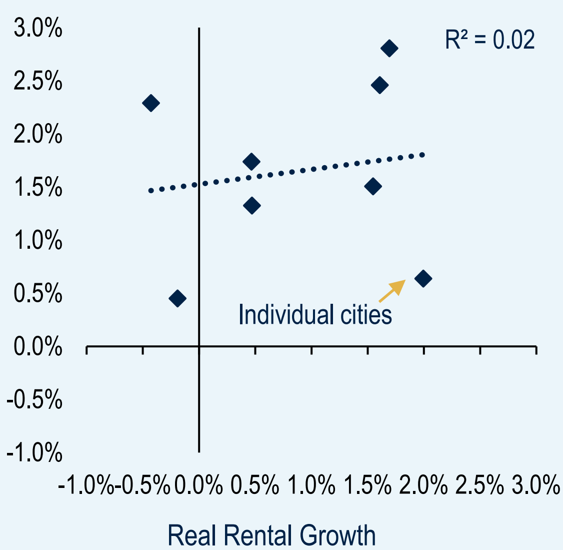
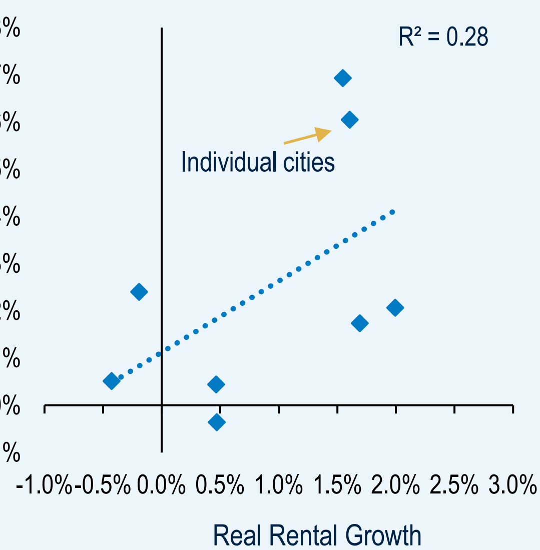


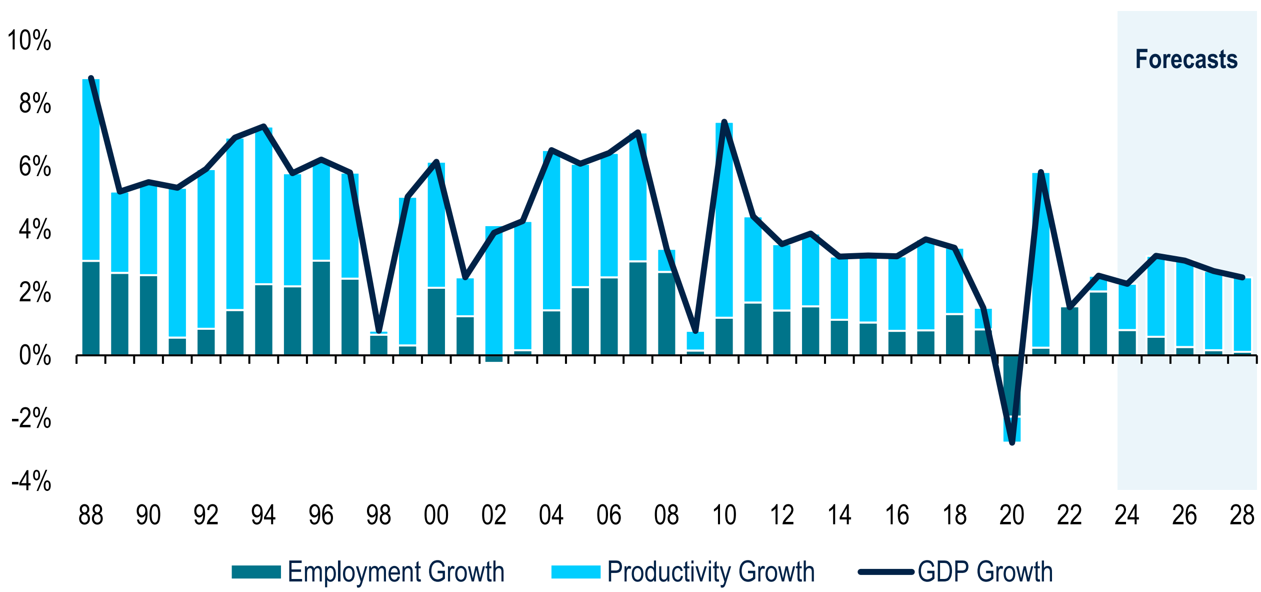
Exhibit 7b: Average City Productivity Growth vs. City All Property Prime Real Rental Growth, 2001-23 (% p.a.)



Sources: JLL, Oxford Economics, PGIM Real Estate. As of February 2024.

So why is this important? It is important because forecasts for economic growth globally, as well as across Asia Pacific, have productivity as the driver over employment (**Exhibit 8**). Aging societies, alongside high employment rates/high labor force participation rates, are causing jobs growth to slow versus a productivity lift due to advances in AI. If this shift to productivity growth arises then for Asia Pacific in particular, where productivity growth is set to be higher than the rest of the world, real rental growth might yet prove to be stronger than expected.

Exhibit 8: Contributions to Real GDP Growth, Major Asia Pacific Economies (% p.a.)



Sources: Oxford Economics, PGIM Real Estate. As of February 2024.
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QUARTERLY INSIGHTS | INVESTMENT RESEARCH

EUROPE

Key Themes

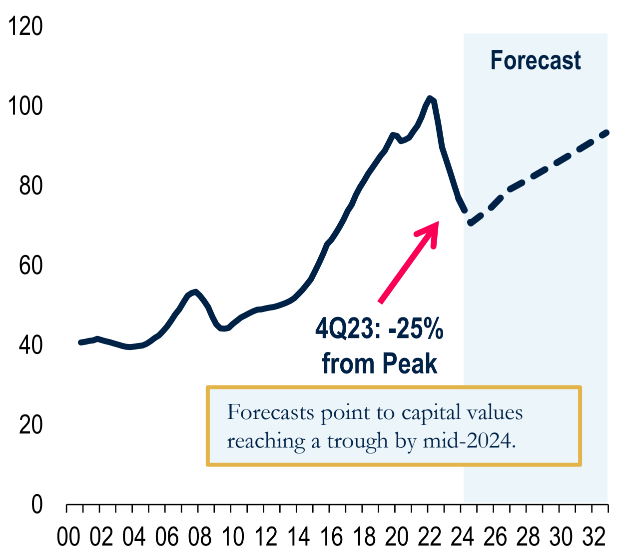
- When Are Real Estate Values Expected to Stop Falling?
- What Does the Return of Capital Value Growth Mean for Sectors and Geographies?
- Will Office Come Back Into Focus Beyond This Year?

When Are Real Estate Values Expected to Stop Falling?

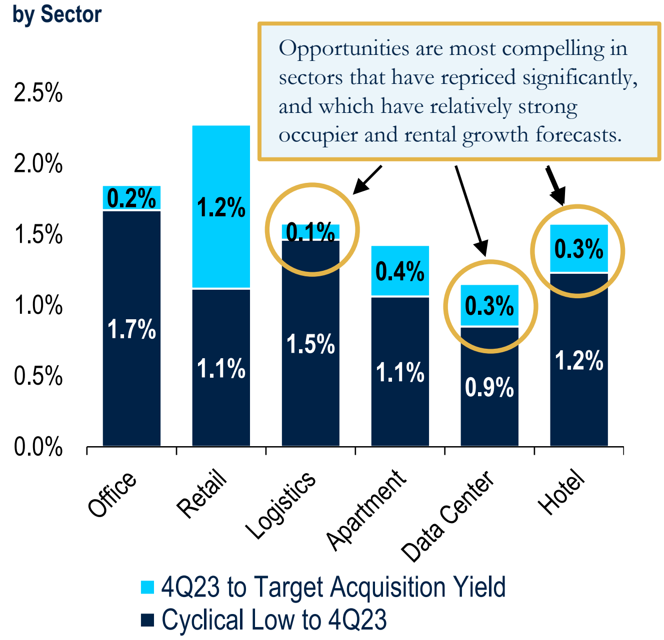
Falling inflation and sluggish growth are providing central banks with room to cut interest rates this year, potentially as early as 2Q24. At the same time, real estate values had another weak quarter in 4Q23 as they further adjusted to higher rates and an illiquid market environment. As a result of lower values and improving sentiment, our outlook is that the turning point for values will come in the middle of 2024 (**Exhibit 1**).

Exhibit 1: Real Estate Value Correction Nearly Done

Prime Nominal Capital Value Index, Europe All Property (4Q21=100)



Prime Market Yield Correction to Target Acquisition Yield by Sector



Sources: PMA, Cushman & Wakefield, CBRE, PGIM Real Estate. As of February 2024.
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There are some variations by sector. In logistics, data centers and hotels, values have already fallen a long way and these sectors have a resilient rental growth outlook that is supported by structural trends, such as rising digitalization and a bounce back in tourism. Values in these sectors don't have to adjust much further to represent target yields, which are consistent with long-term fair value (**Exhibit 1**).

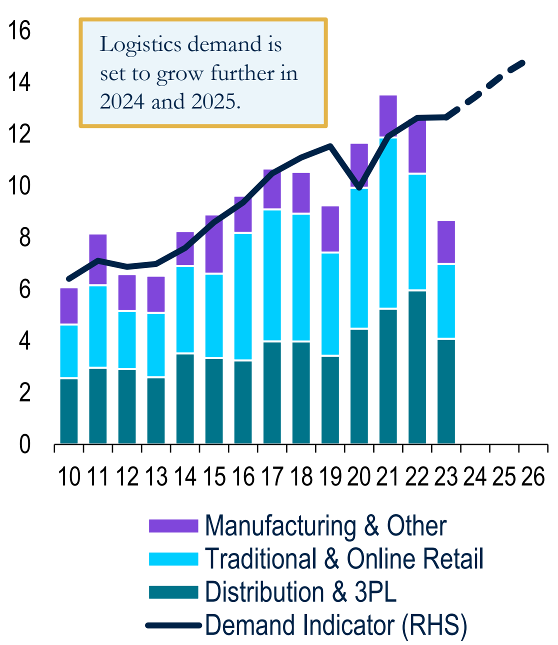
In other sectors, the value correction has further to run either because target pricing is still some way off (i.e., in retail) or because the rental growth outlook is less certain and liquidity is very low, which could mean values will overshoot (i.e., in office). However, falling interest rates are set to reduce pressure on values to fall beyond 2024 in all sectors.

What Does the Return of Capital Value Growth Mean for Sectors and Geographies?

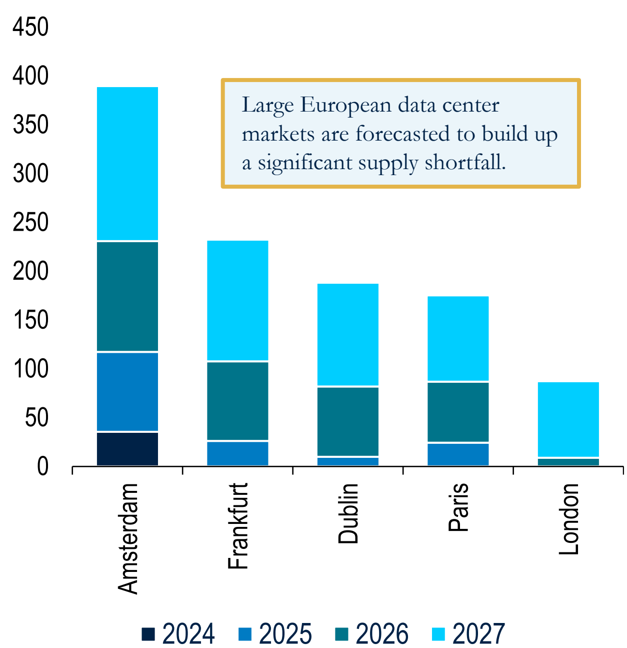
As capital value growth returns, underlying occupier demand by sector and by city is going to re-emerge as a performance driver. One sector where the opportunity set is expected to grow further is logistics, where the demand story took a hit in 2023, but our indicator points to a broad and sustained pick up in occupier demand in 2024 and 2025 on the back of supply chain restructuring and expansion of online capacities among e-commerce players and traditional retailers (**Exhibit 2**).

Exhibit 2: Investment Opportunities Where the Sector Demand Outlook Is Strong

Logistics Demand Indicator (Index, 2010=100) and Take-Up by Sector (Million square meters)



Data Center Supply Shortfall (Megawatt)



Sources: Oxford Economics, PMA, PGIM Real Estate. As of February 2024.

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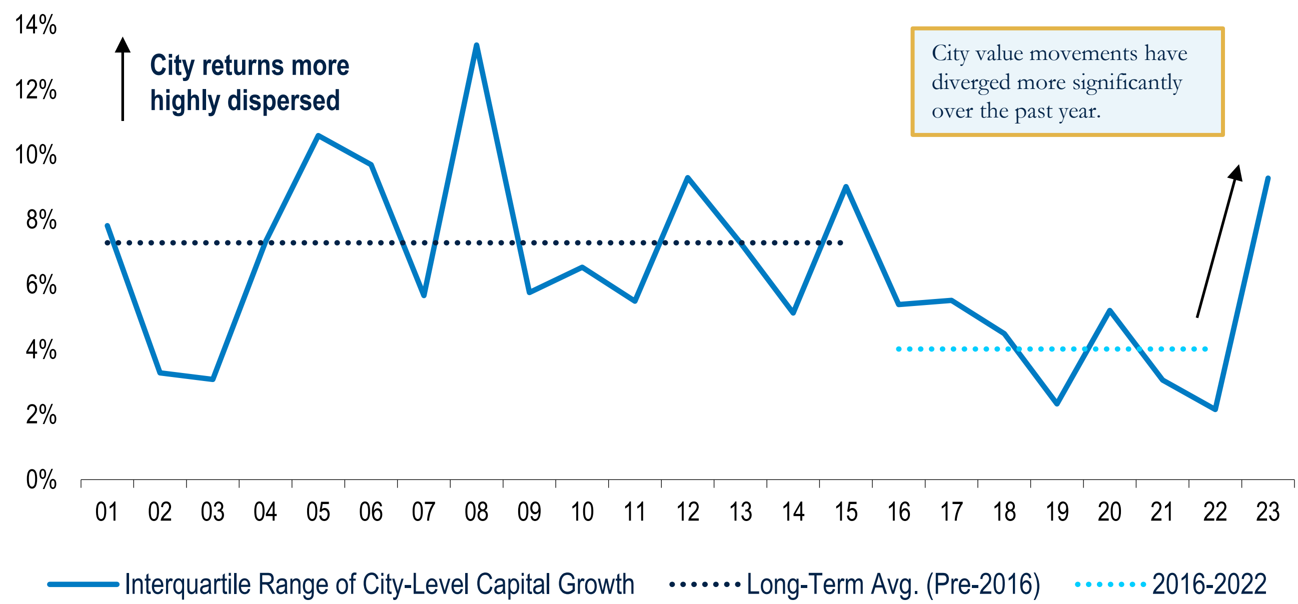
Similarly, the rise in digitalization is also driving demand for physical data center space on the back of growing needs linked to such factors as AI adoption, streaming and cloud computing – despite rising efficiency in the sector that partially reduces demand for physical data center space. Forecasts point to a significant data center supply shortfall across Europe's major markets, linked to constraints around land and power availability (**Exhibit 2**), which opens up opportunities to develop new stock with the right operating partner that is able to help overcome supply constraints.

At the same time as sector differences are playing out, geographical diversification is becoming more important again. In the years before the downturn, low interest rates and moderate economic growth across Europe had led to relatively uniform performance across cities at lower absolute return levels (**Exhibit 3**).

In 2023, as values fell in adjustment to rising rates and faltering economic growth, differences in city performance increased significantly back to levels recorded pre-2015. As uncertainty around occupier market performance persists going into the next upswing, relative returns across European cities will vary significantly and opportunities will arise more selectively in pockets of growth by city.

Exhibit 3: Geographical Diversification Becomes More Important Again

Range of Annual City-Level All Property Capital Value Growth (%)



Sources: PMA, Cushman & Wakefield, CBRE, PGIM Real Estate. As of February 2024.

Will Office Come Back Into Focus Beyond This Year?

The rise in hybrid working has structurally affected the office demand outlook, in particular in secondary, non-CBD markets that saw take-up fall and vacancy rise. At the same time, low yields came under pressure from quickly rising interest rates, leading to significant value declines and drying up liquidity. As economic growth returns, supporting occupier market performance, and interest rates are cut in 2024, alleviating pressure on values, office investments are set to move back into focus beyond this year.

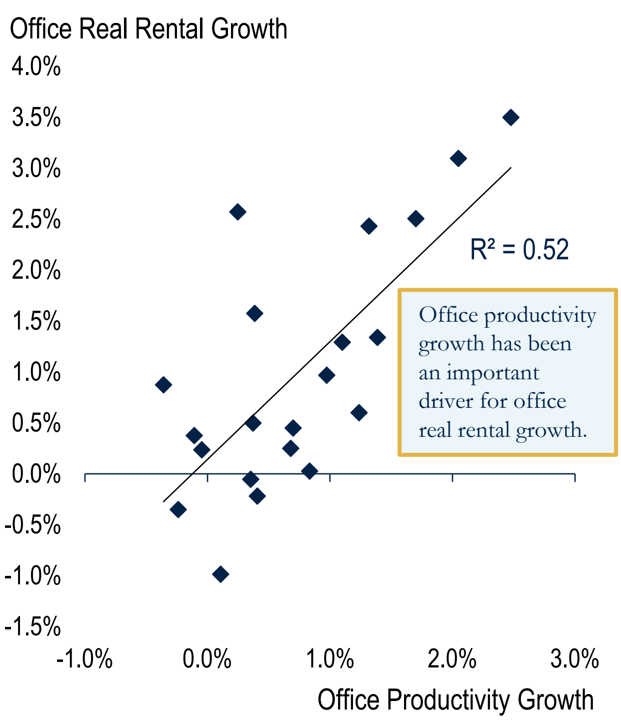
Looking at economic fundamentals, office productivity growth (the rise in office output per office worker) and office real rental growth have been closely linked in the past. When office productivity rises, the ability for office tenants to pay higher rents also increases (**Exhibit 4**) and landlords have usually been able to benefit.

With the interest rate outlook changing over the last quarter, forecasts for a pick up in office productivity growth over the next few years are gaining credibility as, among other factors, increased investment in a lower interest rate environment and the rising adoption of AI are forecasted to boost office productivity growth (**Exhibit 4**).

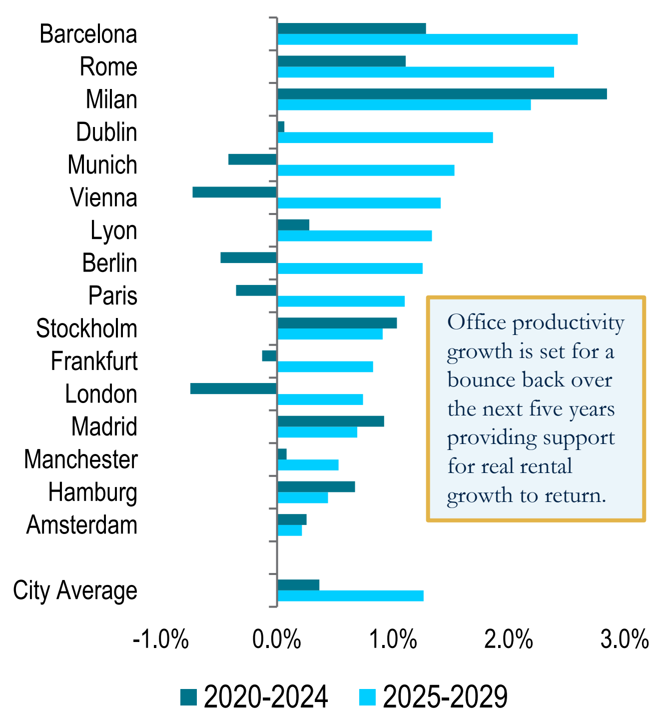
In conjunction with the constraints of prime office availability brought by ESG regulation across European markets, this means investing in office assets in CBD locations promises attractive income growth at potentially mispriced values for core investors.

Exhibit 4: Improving Economic Backdrop Will Drive Opportunities Beyond 2024

City Office Productivity Growth versus Office Real Rental Growth (1996 – 2023)



City Office Productivity Growth (2020-24 versus 2025-29)



Sources: Oxford Economics, PMA, Cushman & Wakefield, PGIM Real Estate. As of February 2024.

QUARTERLY INSIGHTS | INVESTMENT RESEARCH

UNITED STATES

Key Themes

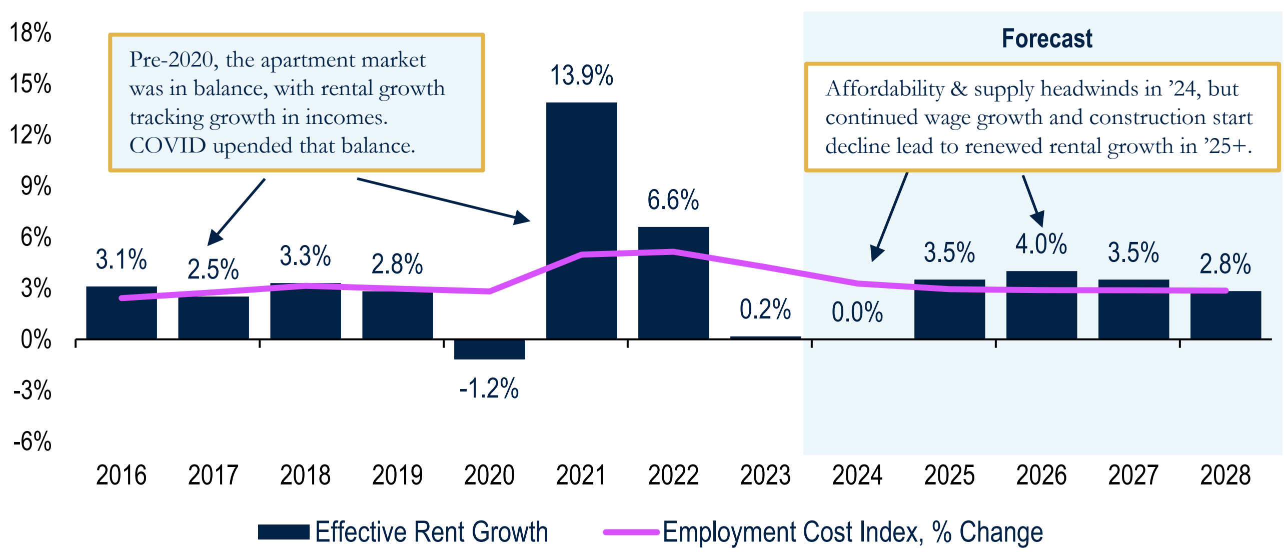
- After a Post-COVID Boom, Can Apartment Rents Keep Rising?
- How Much More Can Retailers Pay for Shopping Center Space?

After a Post-COVID Boom, Can Apartment Rents Keep Rising?

The traditionally close relationship between income growth and apartment rents has broken down since 2019, as shown in **Exhibit 1**. In 2020, rents fell even as incomes rose. That proved to be a temporary hiccup, followed by two years when rents spiked. Then, last year two things happened at the same time. New apartments were built at the highest rate in over 20 years, and renters became cost-conscious. Rent growth abruptly stopped. We expect rents will remain flat for another year, until incomes catch up and the supply wave peaks.

Exhibit 1: Rents Need Another Year to Catch Up With Incomes

U.S. Apartment Rent Growth vs. Wage/Salary Growth (Employment Cost Index*)



* We use the Employment Cost Index as a proxy for income growth because the ECI is a high frequency indicator that controls for changes in workforce occupations.
Sources: RealPage, Moody's Analytics, PGIM Real Estate. As of February 2024.
Forecasts are not guaranteed and may not be a reliable indicator of future results.

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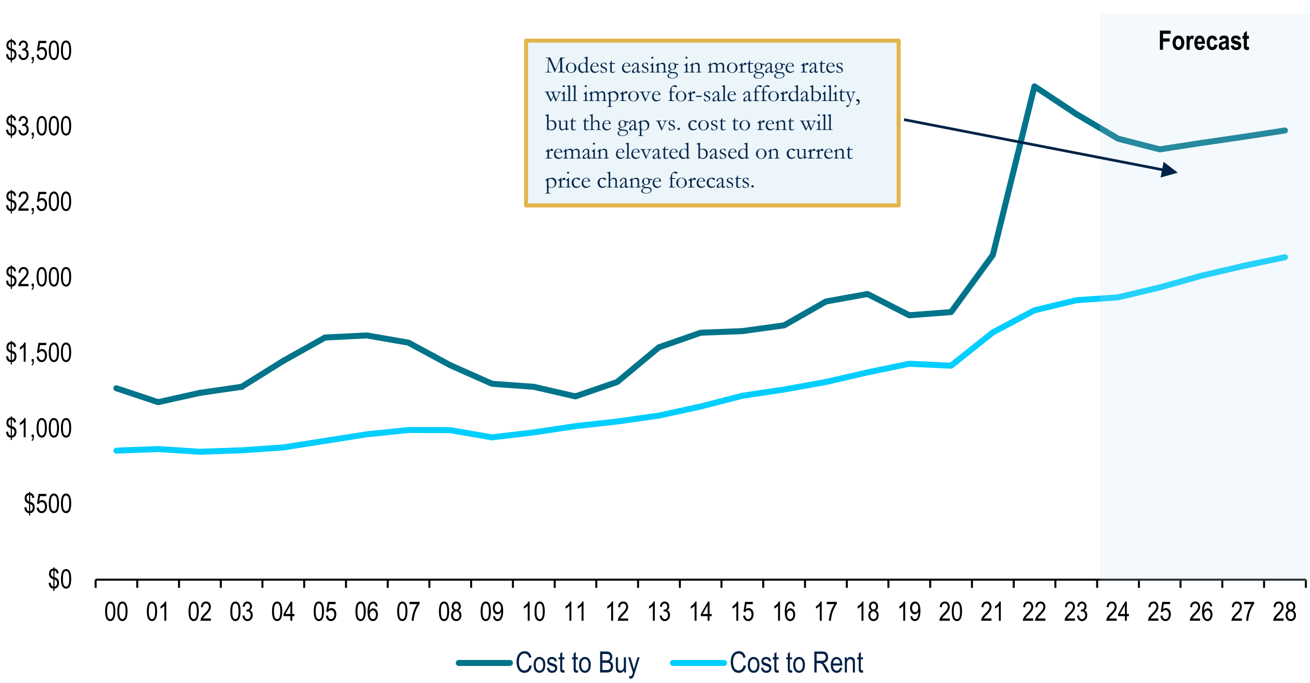
With rents rising well ahead of incomes, and a wave of new supply that will persist into 2025, one might wonder why average rents aren't declining. (In some of the more oversupplied markets, they are falling, though this is counterbalanced by gradually rising rents in cities that have less new construction.)

The answer is shown in **Exhibit 2**, which compares the average cost of renting with the average cost to buy a residence. The increase in home prices and mortgage rates has made homeownership far more expensive than renting, keeping many who otherwise would have become homeowners in the renter pool for longer. Absent an economic downturn, this puts a floor under rents around today's levels, while also setting the stage for rent growth to resume once supply pipelines thin out after 2024.

Exhibit 2: Expensive Homeownership Costs Limit Rent Declines

Cost to Buy vs. Cost to Rent, Monthly Payment



Sources: Federal Reserve Board, Oxford Economics, RealPage, Moody's, American Community Survey, PGIM Real Estate. As of February 2024.
Forecasts are not guaranteed and may not be a reliable indicator of future results.

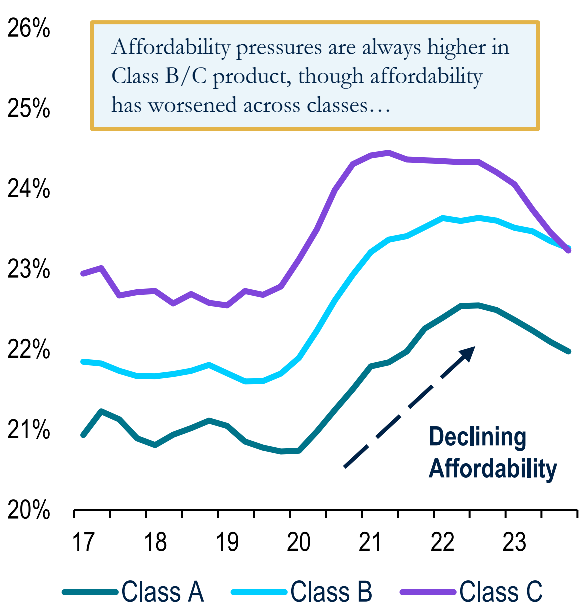
That average tells an incomplete affordability story for apartments. While rents outpaced average income growth in 2021 and 2022, this affordability squeeze was not borne equally across renters. As shown in **Exhibit 3**, rent-to-income ratios rose more in the Class B and Class C segments than in Class A** rentals.

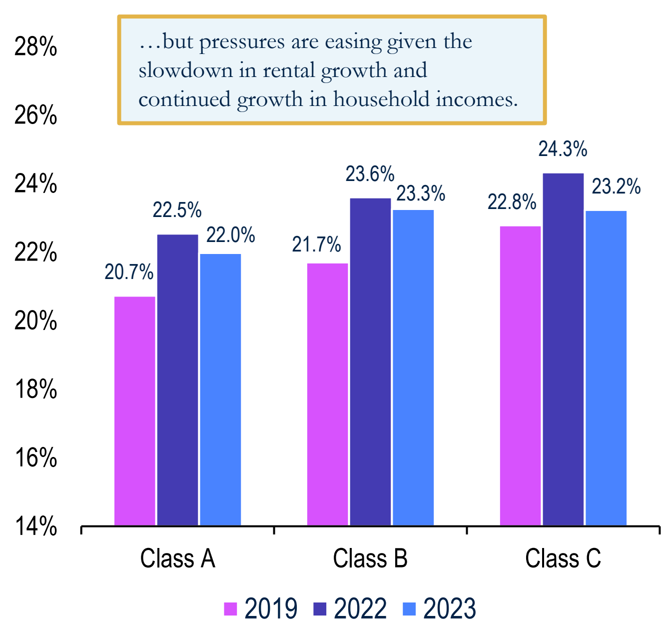
Since 2022, apartments have become more affordable across classes, as incomes grew and rent growth slowed, yet with significant differences. Class A renters have benefited from the addition of more units, giving them better bargaining power. Class C renters have benefited the most from tight labor markets, with wage growth for the lower-income households increasing faster than average- and high-income households.

That has left middle-income renters the most strained. Rent-to-income ratios for Class B renters have only declined by 30 basis points since the 2022 peak, and are now the same as for Class C renters. We expect these renters to push back most on rent increases this year

Exhibit 3: Affordability Pressures Are Highest in Class B/C Rentals

Median Rent to Income by Apartment Class*





*Institutionally owned properties as tracked by RealPage.
** Class A represents apartments that have the highest rents per square foot, accounting for approximately 1/3 of the stock at the national level, followed in quality by Class B and Class C.

Sources: RealPage, PGIM Real Estate. As of February 2024.

How Much More Can Retailers Pay for Shopping Center Space?

After more than a decade of consolidations and bankruptcies, retailers are now healthy enough to afford higher rents. With vacancies now tight, they will need to.

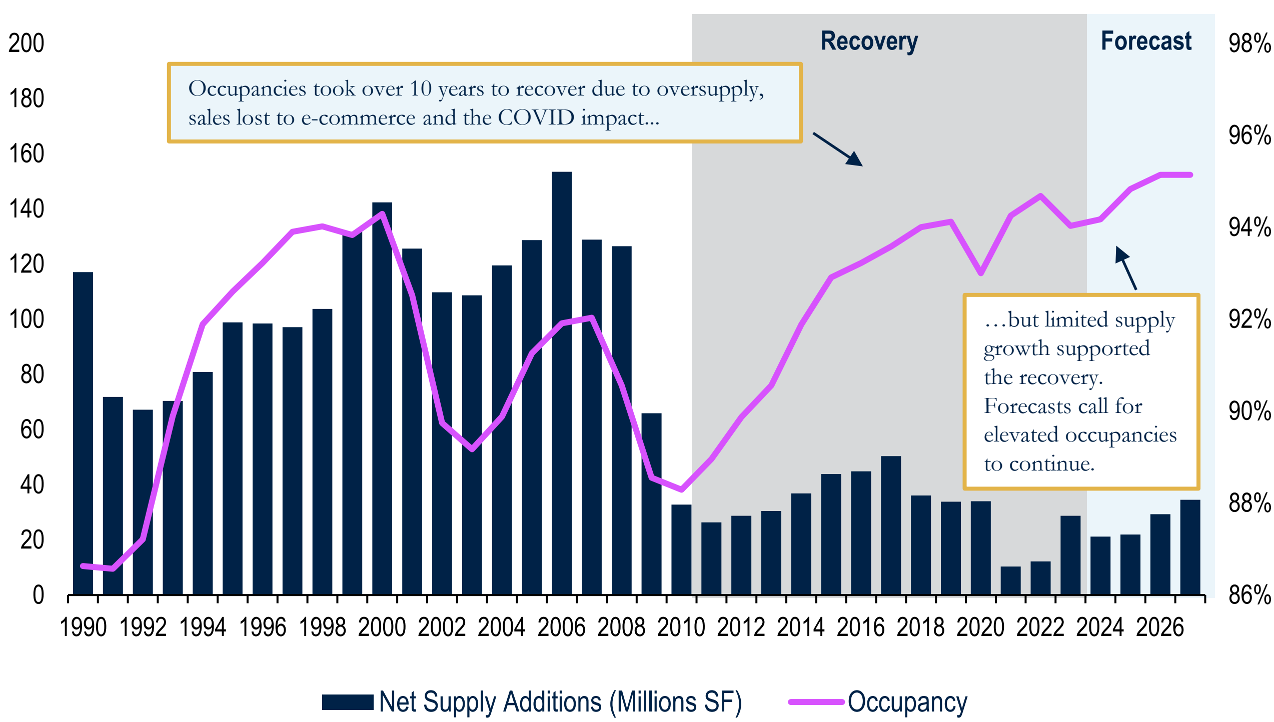
The Global Financial Crisis set off what was to be more than a decade of headwinds for retail real estate in the U.S. A severe supply overhang from overbuilding in the 2000s weighed on property performance just as e-commerce accelerated, only to be exacerbated during the throes of the COVID pandemic.

Now the sector is much healthier. Some creative destruction is still ongoing (as is always the case) but tenants generally are expanding. Retail occupancies are the highest they have been in decades, as shown in **Exhibit 4**. As of fourth quarter 2023, neighborhood, community and power centers included in the NCREIF Property Index were 94% leased, a hair shy of the previous peak of 94.4% recorded in 2000. We expect occupancies to rise further.

This has been supported by a cycle of little new supply. Developers and banks have limited their exposure to large-scale speculative retail projects, meaning that what little construction is being completed is largely preleased, keeping overall occupancies high.

Exhibit 4: The Scars of the Late-2000s Retail Collapse Are Now Healed

Net Retail Supply Additions vs. Strip Center Occupancy



Sources: NCREIF, CoStar, PGIM Real Estate. As of February 2024.
Forecasts are not guaranteed and may not be a reliable indicator of future results.

Now that space markets are tight, the question is – can tenants afford to pay more? We believe there is scope for higher rental growth outlook than the market may be assuming.

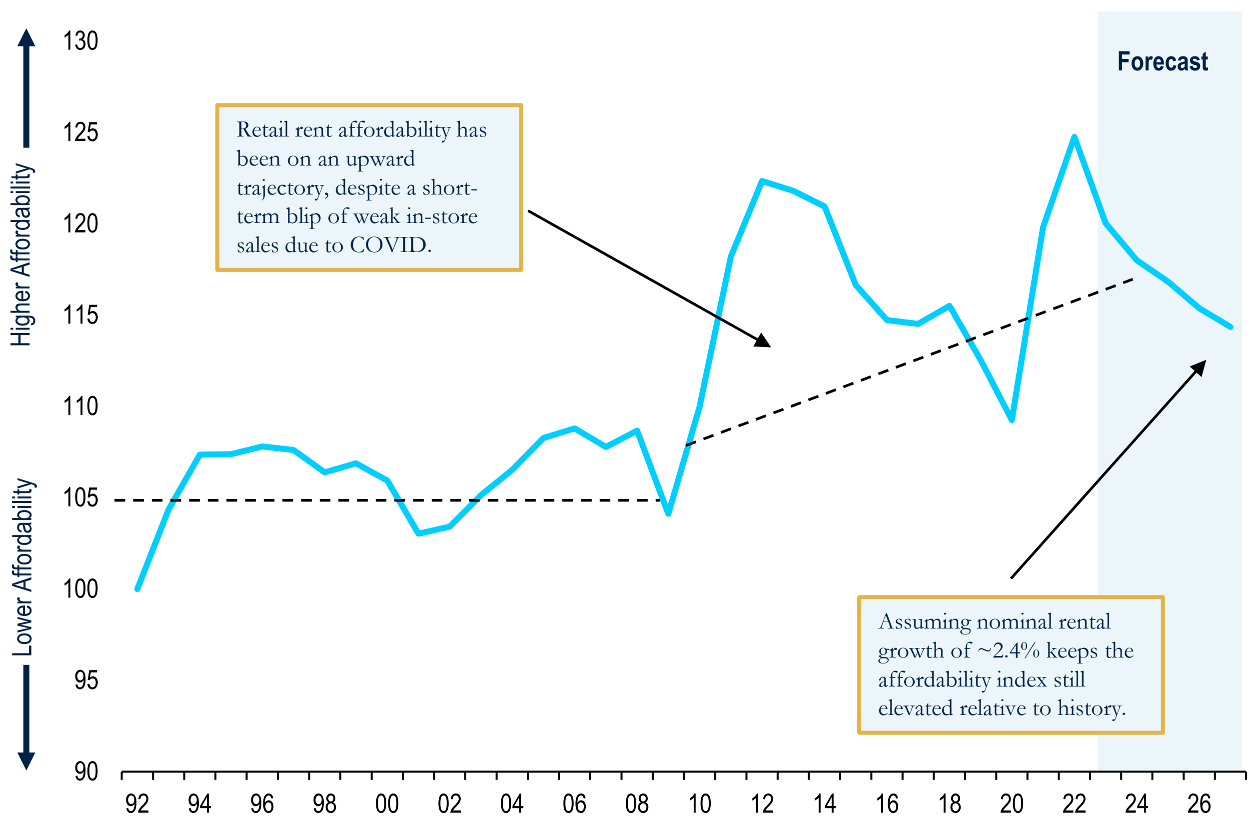
Rental growth for retail space has been weak for nearly two decades. Adjusted for inflation, real rents for retail space are 13% below where they were at the end of 2006, according to CoStar. At the same time, real sales per square foot (PSF) has trended up, even accounting for sales lost to e-commerce.

By comparing the two measures, we have created a Retail Affordability Index. A rising index implies increasing affordability and a declining index implies the opposite. As shown in **Exhibit 5**, the index has trended upward since 2008, implying increased affordability of retail space.

Assuming baseline rental growth forecasts of 2.4% p.a. (in line with multiple third-party forecasts), that ratio between sales PSF and rents PSF would remain historically high from 2024 to 2028. This indicates potential upside to the outlook, particularly given space markets will be as tight as they have been in at least 20 years. Even assuming rental growth of ~3% p.a., the affordability index would remain above levels that prevailed from the 1990s and 2000s.

Exhibit 5: Retailers Can Afford to Pay More (If They Want to)

Retail Rent Affordability Index



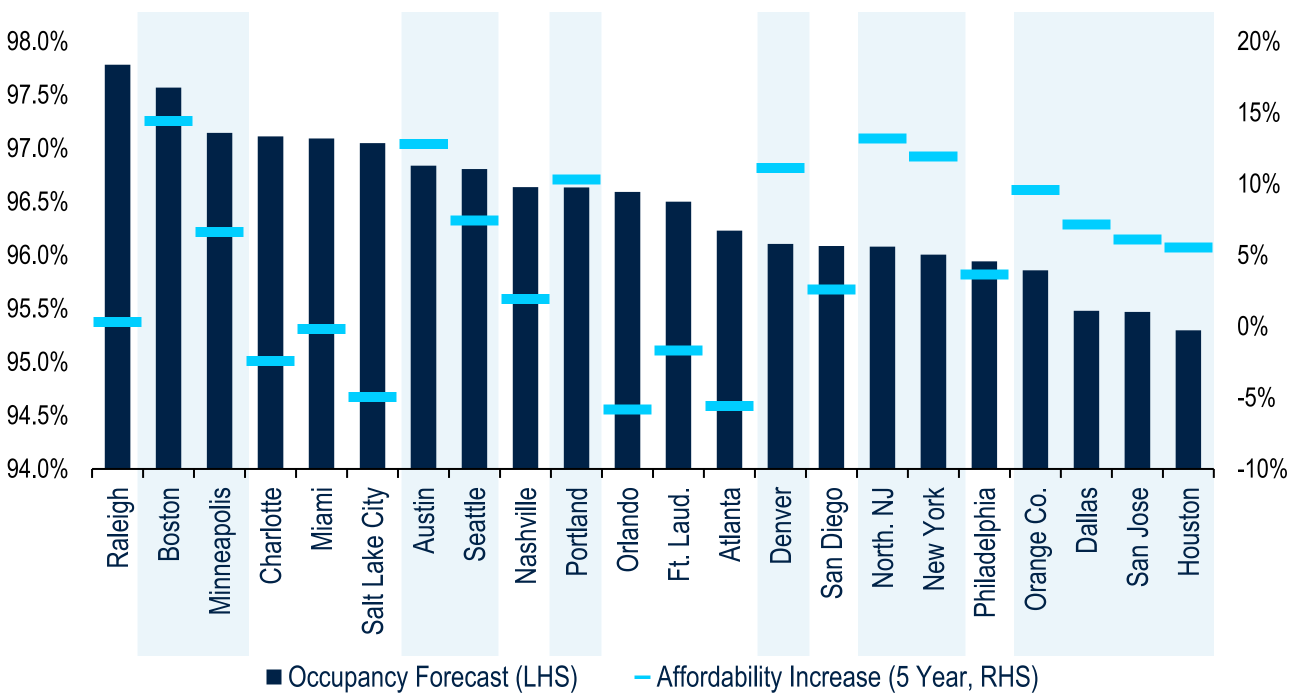
Sources: CoStar, Oxford Economics, PGIM Real Estate. As of February 2024.
Forecasts are not guaranteed and may not be a reliable indicator of future results.

Moreover, we identify markets where this measure has improved the most in recent years to judge whether certain markets may have greater upside to their rental outlook than others. In **Exhibit 6**, we show the markets with the highest projected occupancies and call out those markets that have seen retail sales PSF outpace growth in rent PSF to a greater degree.

The list is a diversified mix of markets from different regions. Of note are the presence of all three major metros in Texas, arguing for healthy rent growth in that state. Additionally, the New York/New Jersey metro area and Boston are both highlighted, pointing to a positive outlook for the Northeast.

Exhibit 6: Many Retail Markets Have Further Room to Run

Occupancy Forecast (2024-2028) vs. Affordability Index Change (2018-2023)



Sources: CoStar, Oxford Economics, PGIM Real Estate. As of February 2024.

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