PGIM REAL ESTATE

4Q22

INVESTMENT RESEARCH

QUARTERLY INSIGHTS

As a downturn hits, analysis very quicky shifts from how likely it will happen to how bad it will get. And this downturn is no different. But by degrees the answer to those questions vary across regions. In terms of investment implications, several key factors – weaker growth outlook, inflation pressures, higher interest rates, debt financing constraints – apply in almost all markets. At the same time, we know from history outcomes will vary across global sectors and regions. This serves as another reminder, especially in uncertain times, of the advantages of holding a globally diversified portfolio, whether it be for debt or equity investment strategies. This quarter we examine opportunities across three regions against that backdrop.

For professional investors only. All investments involve risk, including the possible loss of capital.

REF: 006638

QUARTERLY INSIGHTS | INVESTMENT RESEARCH

ASIA PACIFIC

Key Themes

- Will a Sharp Increase in Borrowing Costs Give Rise to More Willing Sellers?
- Resilience from Diversity – Will Asia Pacific Real Estate Values Hold Up?

Will a Sharp Increase in Borrowing Costs Give Rise to More Willing Sellers?

With major central banks outside of Japan tightening their monetary policies to counter rising inflation in recent months, borrowing costs have increased sharply in most developed Asian markets (**Exhibit 1**, left chart). Banks are also becoming more selective, restricting their lending conditions amid strong global economic headwinds.

Tighter lending conditions have led to a growing polarization in the real estate credit markets. While quality assets with high occupancy rates and strong tenant covenants can still find financing options from lending institutions, lower quality assets or speculative development projects are facing significant challenges to secure bank loans[1].

Higher borrowing costs and tighter credit market conditions have also resulted in a significant slowdown of investment activities, with total transaction volumes in the first three quarters down by nearly 20% in comparison to the same period last year. The widening spread between buyer's and seller's pricing expectations was among the major factors leading to lower transaction volumes[2].

However, as pressures from the increase in financing costs continue to build up, there are reasons to believe that sellers may become more willing to adjust prices to meet buyers' expectations of discounts. In almost all markets outside of Japan, the cost of borrowing is now higher than the asset's income yields[1]. In other words, asset owners are facing the risks of "negative carry," particularly in highly leveraged investments.

Our estimates of the interest coverage ratio (ICR) for real estate debts – excluding Japan – show that the regional average of ICR has fallen sharply in recent months toward 2.0, a level considered as a standard threshold for a loan's healthy interest coverage (**Exhibit 1**, right chart). The relatively low use of leverage, i.e. LTV, since the global financial crisis (GFC) helps soften some pressures on ICR as interest rates rise. However, with interest rates likely rising further in the coming months, there will be an increasing number of assets breaching ICR requirements.

[1] JLL, PMA.

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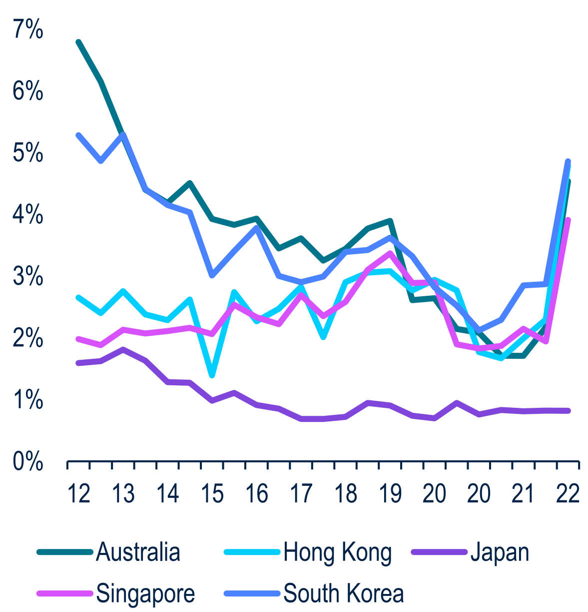
Owners of assets wanting to refinance their debts in the current environment, particularly for those using high leverage, will likely be required to inject more capital to lower the leverage ratio to comply with the standard ICR requirements. Some may choose to sell their assets instead and are more likely to accept necessary discounts.

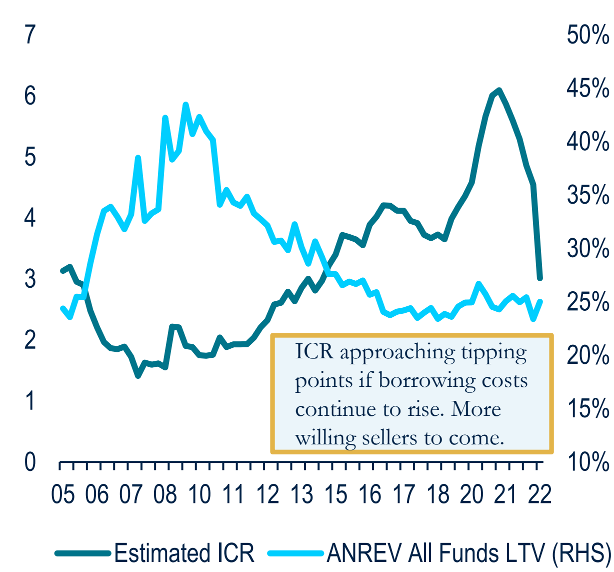
While we do not expect a large number of distressed sales across markets, rising pressures from higher financing costs on debt covenants will likely force more willing sellers to the markets in the coming quarters.

Exhibit 1: Cost of borrowing has increased sharply outside of Japan – low LTV helps but ICR is eroding fast

Estimate of Real Estate Borrowing Cost – As of Sept 2022



LTV and Estimated ICR (Excluding Japan)



Note: ICR is estimated using ANREV's All Funds LTV and ANREV's All Funds GAV, JLL's historical cap rates and borrowing costs from PMA & Oxford Economics. Markets include Australia, South Korea, Singapore and Hong Kong.
Sources: ANREV, Oxford Economics, PMA, PGIM Real Estate. As of November 2022.

[2] MSCI Real Capital Analytics.

Resilience from Diversity – Will Asia Pacific Real Estate Values Hold Up?

Global real estate investors often come to Asia in search of stronger growth and diversification from their home markets[3]. Data from the Global Real Estate Fund Index (GREFI)[4] shows that annualized real estate returns in the APAC region have outperformed the global average since 2005, noting the delivery of return premium as expected.

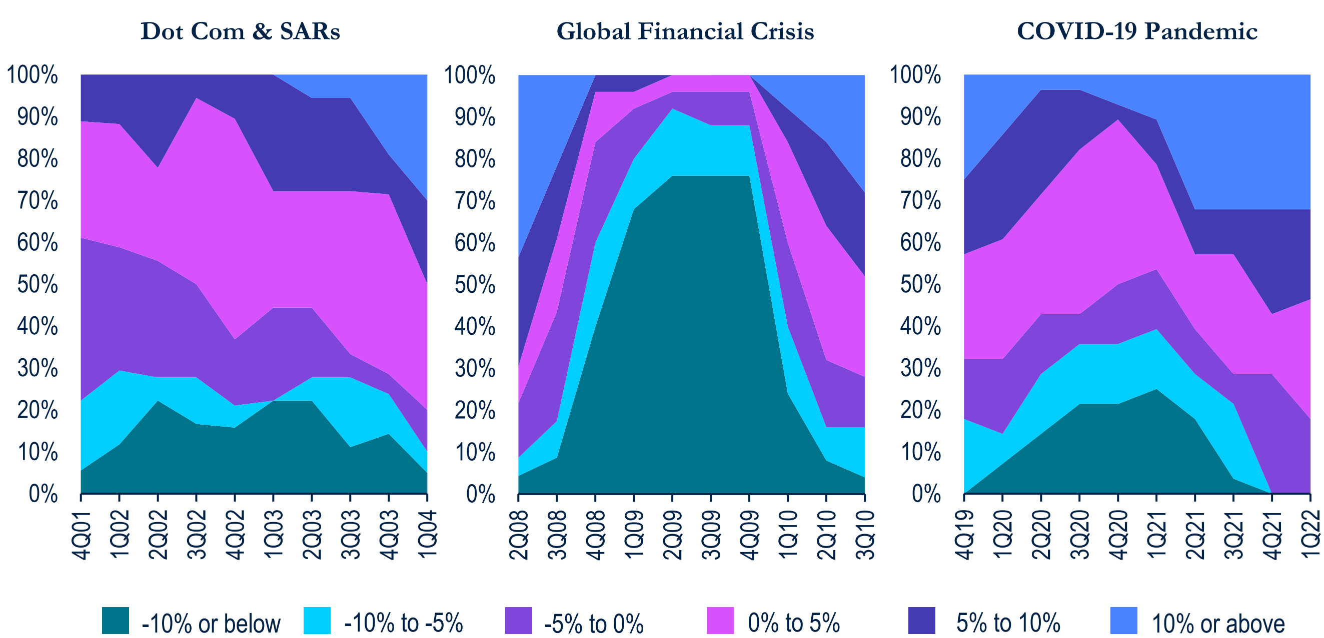
The dynamism of market conditions in Asia also offers investors the benefits of intra-regional diversification, helping pan-regional portfolios avoid a synchronized decline during market downturns. Evidence from previous down cycles shows that Asia Pacific, as a region, has weathered both regional and global headwinds relatively well (**Exhibit 2**).

In regional episodes of market moderations, such as the eurozone debt crisis in 2011 and the taper tantrum in the United States in 2013, Asian markets held up well. At the peak of its own regional event, such as SARs in 2002/03, nearly 50% of markets in Asia still reported capital value growth (**Exhibit 2**, left chart). During global downturns, such as the GFC in 2008/09, the impacts spread much wider, with nearly 90% of markets reporting capital value declines (**Exhibit 2**, center chart). However, capital value declines were in a moderate range of 10% p.a. at its trough (**Exhibit 3**).

The current global market environment might give a sense of a synchronized downturn coming. Rising inflation and higher interest rates seem to be the top concerns for most major economies across the world.

Exhibit 2: Diverse market conditions help diversify capital value performance during downturns

Distribution of Capital Value Growth (% p.a.) During Previous Downturns*



*Note: Includes all major markets across sectors in Australia, Hong Kong, Japan, Singapore and South Korea.
Sources: JLL, PGIM Real Estate. As of November 2022.

[3] ANREV, "Investment Intentions Survey 2022."
[4] ANREV, INREV and NCREIF, "Global Real Estate Fund Index," 2Q 2022.

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Within Asia Pacific, global headwinds are particularly acute in the export-dependent economies of Hong Kong, Singapore and South Korea. Australia too has been faced with similar pressures in recent quarters.

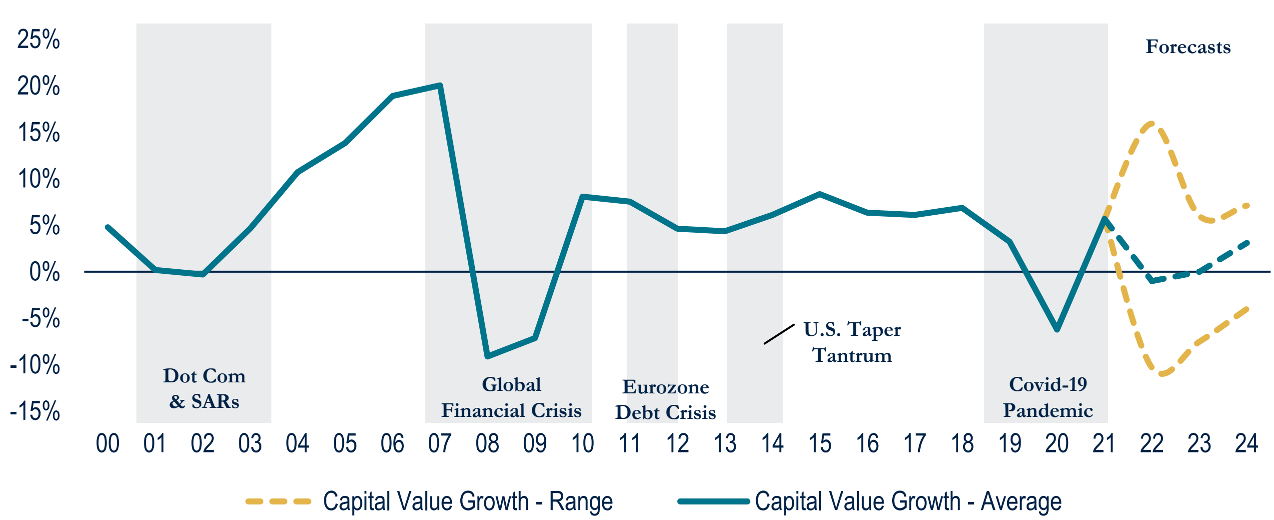
However, the dynamism of the region is well demonstrated again with China and Japan – the two largest economies in the region, and the second and third largest economies in the world, respectively – continuing to counter this global trend. Japan continues to maintain its highly accommodative monetary policy, while China is actively easing its policy to provide a boost to the weakened domestic economy. Both countries report moderate to low inflation pressures. While there are risks to the policy outlook such as a change for higher interest rates in Japan or challenges in implementing reopening policy in China, we believe that the base case policy outlook for both countries to remain differ to other countries in the region.

With the U.S. and major European economies being on the edge of falling into recession, Asian economies are certainly feeling the chilly headwinds of slower global demand. Growth momentum is expected to slow down in the coming quarters[5]. And higher interest rates will build pressures on cap rates and capital values in a number of markets. Nevertheless, pockets of cyclical resiliency remain. Japan can still benefit from the recent border reopening in October. And the Chinese economy could regain some strength after the government starts relaxing its highly strict zero-COVID policy, which has been hamstringing its economy over the past two years.

Looking forward, we expect cap rates to expand in a number of markets, most notably in Australia and South Korea. Among major sectors, office and logistics are facing more intense upward pressures on cap rates, leading to capital values decline in some markets. However, at the same time, we think a number of markets, particularly in Japan and Singapore, will have their values hold up relatively well. Reflecting this intra-regional dynamics, capital values are expected to mildly decline at the regional average level but have a wide range of outcomes among individual markets (**Exhibit 3**).

Exhibit 3: No synchronized correction: Capital value growth to vary across markets in APAC

All Property Capital Value Growth* (p.a.)



*Note: Includes all major markets across sectors in Australia, Hong Kong, Japan, Singapore, and South Korea.
Sources: JLL, PGIM Real Estate. As of November 2022.

[5] Consensus Economics.

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QUARTERLY INSIGHTS | INVESTMENT RESEARCH

EUROPE

Key Themes

- To What Extent is European Real Estate Repricing?
- How Exposed are Occupier Markets?

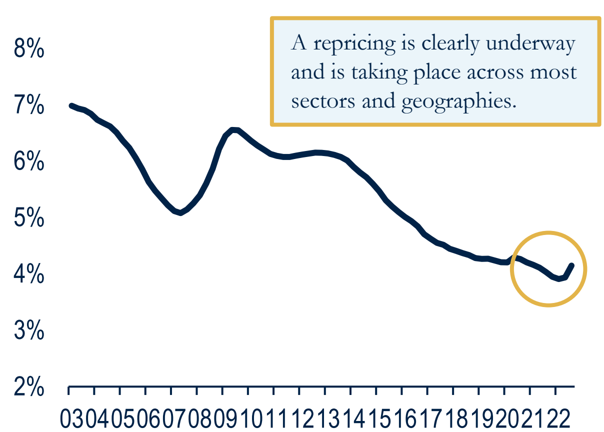
To What Extent is European Real Estate Repricing?

Broadly speaking, we are expecting the repricing of European real estate markets to feature two distinct components. The first relates to the financial aspect of repricing as markets adjust to higher interest rates, and the second – which will be covered in the second part of this note – relates to how an anticipated European recession affects expectations about income growth and vacancy risks.

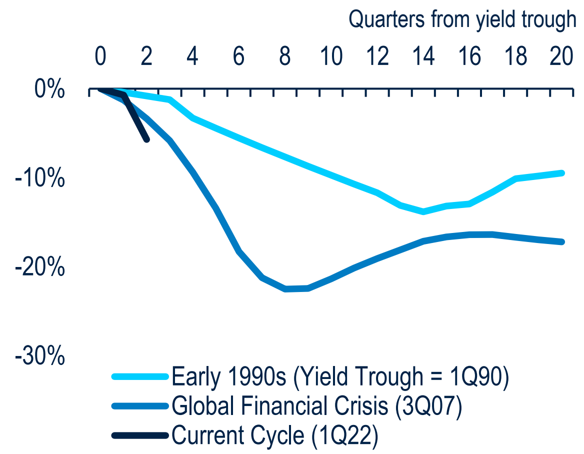
Starting with the financial market-driven component of repricing, yields moved out significantly across major European markets in the third quarter (**Exhibit 1**). While this prime data is backward looking and susceptible to smoothing, the cumulative impact of reported yield shift represents a faster pace of correction than was recorded at the start of the global financial crisis.

Exhibit 1: Repricing is Happening Rapidly

Prime Net Initial Yield – Europe All Commercial Property (%)



Cumulative Yield Impact on Values During Periods of Sustained Yield Expansion – Europe All Commercial Property (%)



Sources: Cushman & Wakefield, PMA, PGIM Real Estate. As of November 2022.

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In REIT markets, where repricing – and often overshooting – can occur rapidly, European-listed real estate values are down 36% year-on-year, which is beyond our estimated -20% threshold that typically indicates it is more than just noise and that a broad correction in private values is going to take place.

The key driver of the repricing in public and private markets alike is the sharp rise in market interest rates. This raises the required return for real estate, pushing up yields if not accompanied by either higher growth expectations or lower risk perceptions – neither of which apply today.

Several other related mechanisms are also at play. One is that because excessively low interest rates were responsible for boosting values by about 30% between 2014 and 2020, much of that is set to be given back up in the current correction (**Exhibit 2**).

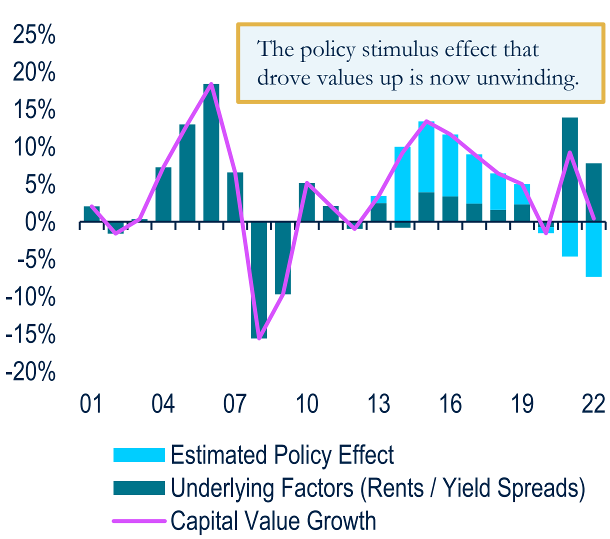
Another relates to the way real estate is financed. As a capital-intensive industry, borrowing costs are highly important within the transactions market. At a simple level, all-in borrowing costs for a prime office building have risen so far as to be above pricing. This suggests a need for higher real estate yields, but will also put strains on deals that need to be refinanced.

Ultimately, higher borrowing costs mean that new buyers have less capital available as debt lenders reduce LTVs to ensure other covenants, such as debt service ratios, remain intact.

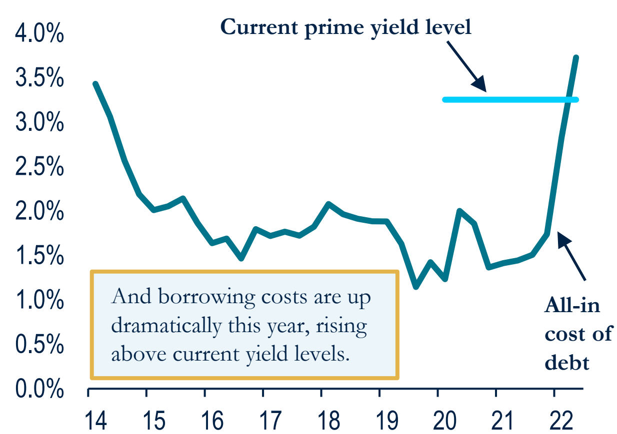
The risk is that a more severe tightening of credit conditions leads to an overshooting of the price correction.

Exhibit 2: Unwinding Policy Stimulus and High Borrowing Rates Are Key Factors

Breakdown of Annual All Property Capital Value Growth – Europe All Property (%)



Europe All-In Debt Financing Costs, Senior Loan, Core Offices (%)



Sources: Bayes Business School, Bloomberg, CBRE, Cushman & Wakefield, PGIM Real Estate. As of November 2022.

How Exposed Are Occupier Markets?

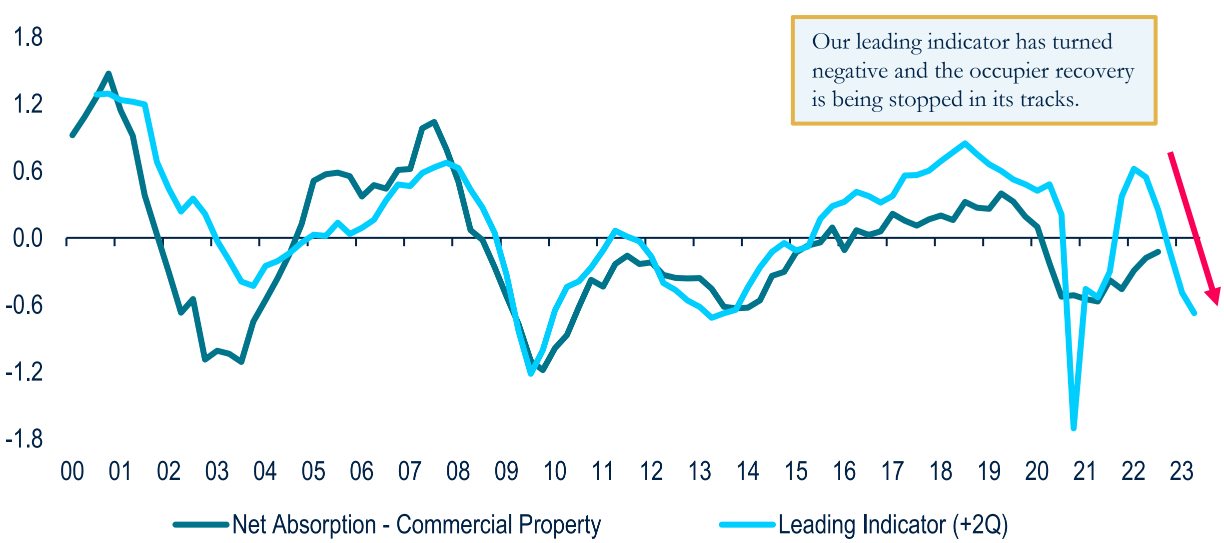
As households and business face higher costs and falling demand, a sharp drop in consumer confidence and hiring expectations – key components of our leading indicator – point toward more challenging conditions for occupier markets.

Leasing demand always lags pricing, and it is worth remembering that until the second quarter, monetary policy – which takes effect over a period of up to two years – was still very supportive for businesses, so we shouldn't expect to see an immediate adjustment.

As such, data on occupier activity has held up fairly well this year, with much demand likely reflecting corporate decisions taken before the negative implications of the Russia-Ukraine war and aggressive central bank action became as clear as they are today. However, our leading indicator has turned sharply downward, suggesting that we will see a material downward shift in demand next year (**Exhibit 3**).

Exhibit 3: Leading Indicator Points to Much Weaker Demand in 2023

Normalized European Commercial Property Absorption and Leading Indicator – Europe



Sources: Cushman & Wakefield, Eurostat, PMA, PGIM Real Estate. As of November 2022.

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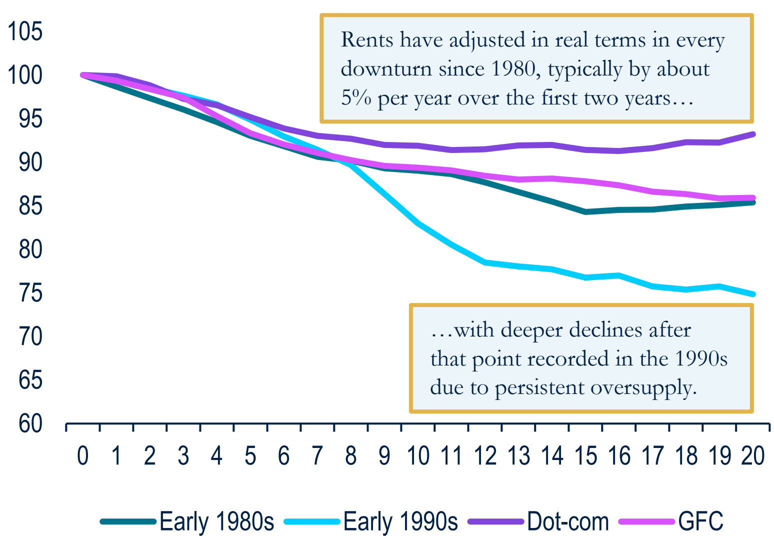
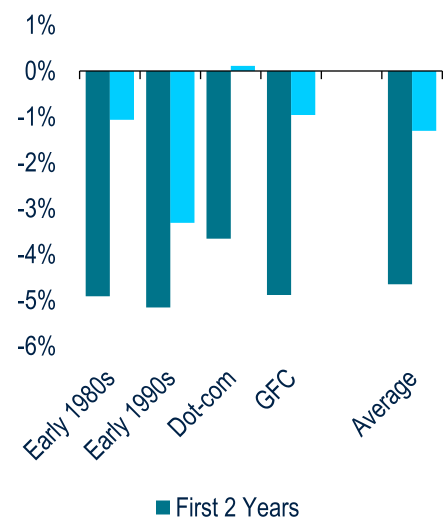
Weaker occupier conditions typically follow upward yield movement, lagging by a year or so based on historical analysis. Importantly, all past real estate downturns since 1980 have featured a significant adjustment in real rent levels on top of any yield expansion (**Exhibit 4**). The magnitude of correction has consistently been about -5% per year for the first two years or a correction, leveling off after that, unless there is a real oversupply problem, such as there was in the early 1990s.

Exhibit 4: History Says Rents Will Fall in Real Terms

Prime Net Initial Yield – Europe All Commercial Property (%)



Real Rental in Five Years Following a Peak (%, Annualized)



Sources: Cushman & Wakefield, PMA, PGIM Real Estate. As of November 2022.

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Ultimately vacancy will dictate whether there is additional distress on top of the financial repricing, much as there was in the early-1990s. The stories vary across the major commercial sectors:

Office

Vacancy has ticked up but is still relatively low (**Exhibit 5**). Completions of new space are very low, but demand is set to ease on the back of weaker sentiment. Real rents are set to fall over the next couple of years, but prolonged oversupply is unlikely. A shift to remote and hybrid working remain a key risk.

Expected impact of occupier market stress on repricing: low-to-medium

Retail

Vacancy is elevated in most markets and formats and is set to weigh on real rental levels for some time. Expectations for a significant adjustment in rent levels point toward a need for higher yields owing to an elevated risk premium requirement to compensate.

Expected impact of occupier market stress on repricing: high

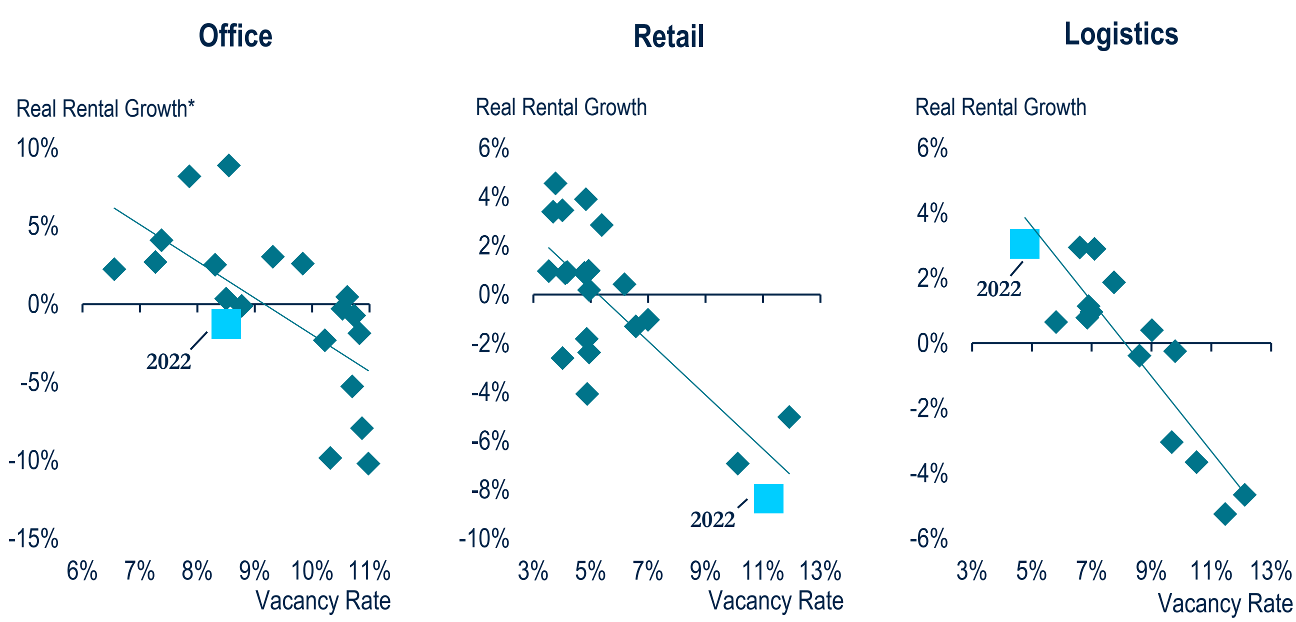
Logistics

vacancy is at a historic low level and real rental growth is elevated. This is bound to cool off in the near term as demand eases on the back of a weaker manufacturing and household spending outlook, but development activity is already slowing and rent levels are likely to be supported by relatively low vacancy rates.

Expected impact of occupier market stress on repricing: low

Exhibit 5: Vacancy Determines the Rental Outlook

Real Rental Growth Versus Vacancy Rate by Sector – Europe



* Note: Office sector real rental growth pushed forward one year.

Sources: Cushman & Wakefield, PMA, PGIM Real Estate. As of November 2022.

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QUARTERLY INSIGHTS | INVESTMENT RESEARCH

UNITED STATES

Key Themes

- Industrial in a Slowing Economy: Resilient But Not Immune
- Reading the Public Market Tea Leaves: What's in Store for Private Real Estate Values?

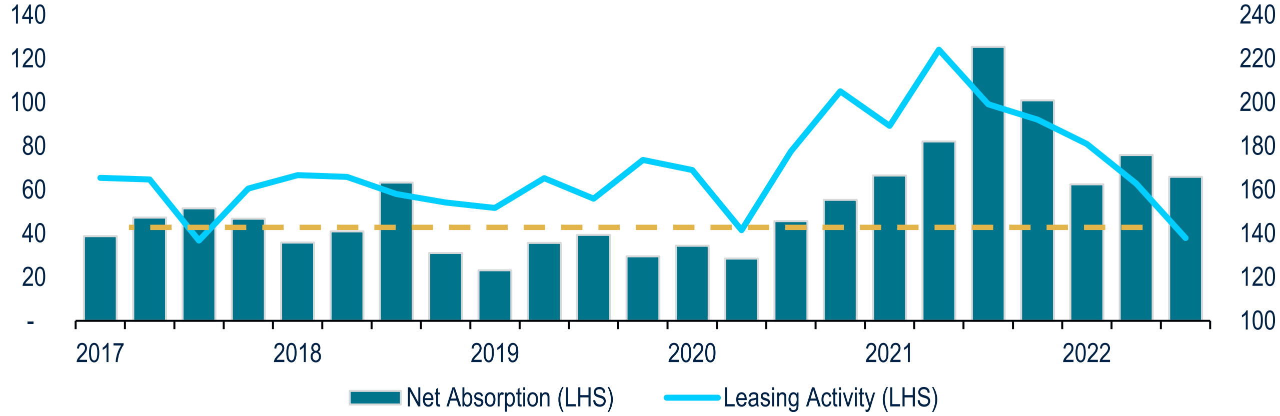
Industrial in a Slowing Economy: Resilient But Not Immune

Widespread adoption of online shopping in the early months of the COVID-19 pandemic, followed by a surge in retail sales as stimulus measures kicked in, caused industrial demand to surge, leading to historically unprecedented occupancy and rent growth. While we expect continued structural support for industrial demand from rising e-commerce sales, that will not be enough to fully offset strengthening cyclical headwinds.

Leasing activity has been slowing since its post-2020 surge, as shown in **Exhibit 1**. It is now at the bottom of the range that prevailed in the pre-COVID years. Further, Amazon, which had a 40% market share of U.S. e-commerce sales and 20% of all industrial net absorption in 2020 and 2021, recently stated that it now has excess distribution capacity and plans to cancel or delay facility openings.

Exhibit 1: Leasing Activity is at its Lowest Level Since 2017

Industrial Demand (Millions of Square Feet)



Sources: CoStar, PGIM Real Estate. As of November 2022.

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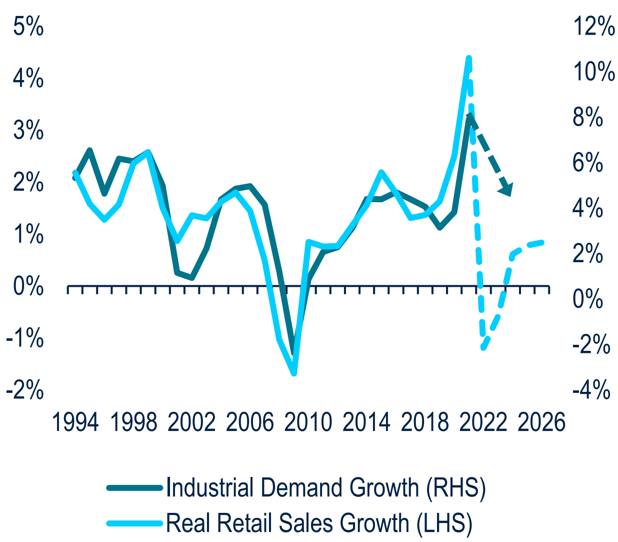
E-commerce overcapacity is not the only headwind for industrial. Between the deteriorating housing market and losses in both equities and fixed income portfolios, the wealth effect will be a drag on consumption. Higher inflation is having an impact as well, as higher food, energy and shelter costs leave consumers with less income left over for other spending. Indeed, as shown in **Exhibit 2**, real retail sales have dropped precipitously since the beginning of the year. Historically, there has been a high correlation between real retail sales and industrial demand – which continued even as e-commerce adoption rose. We expect retail weakness to weigh on the industrial sector.

Exhibit 2: Real Retail Sales Have Dropped Sharply

Real Retail Sales (Ex. Motor Vehicles) Growth vs. Industrial Demand Growth

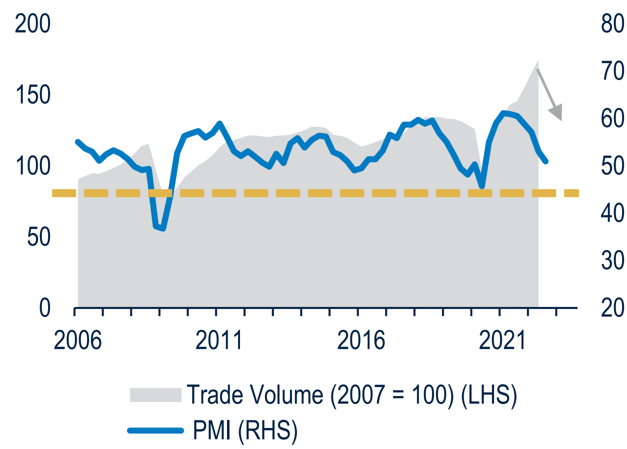


Sources: CoStar, Oxford Economics, PGIM Real Estate. As of November 2022.

On top of domestic economic cooling, central banks around the world are forcefully trying to subdue aggregate demand in an effort to control inflation. The Purchasing Managers' Index has already turned over and is heading below the threshold that indicates negative net demand. As such, we expect a further cyclical drag from lower trade volumes as both imports and exports decline (**Exhibit 3**).

Exhibit 3: Falling Trade Volumes Will be a Headwind to Demand

Purchasing Managers' Index vs. U.S. Trade Volume



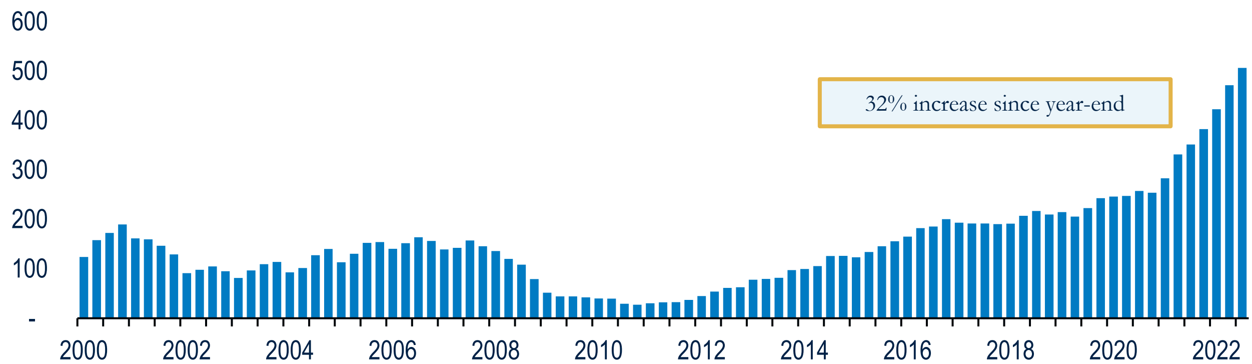
Sources: Bureau of Economic Analysis, Institute for Supply Management, PGIM Real Estate. As of November 2022.

As pressure on industrial demand intensifies, the sector also faces a historic wave of new supply set to come online. For years, supply additions in the sector were surprisingly modest despite the persistent growth in demand, driving historically high occupancies and robust rental growth. However, as shown in **Exhibit 4**, construction activity has quickly accelerated, increasing by a third since the end of 2021 and is now 2.5 times the early 2000s peak.

While our baseline expectation is that this new supply will relieve the pressure on the occupier market and vacancies will remain tighter than previous historical norms, the shift in momentum will diminish the pricing power of landlords and, at best, the pace of rental growth will moderate.

Exhibit 4: Construction Activity is Over Double the Previous Peak

Industrial Space Under Construction (Millions of Square Feet)



Sources: CoStar, PGIM Real Estate. As of November 2022.

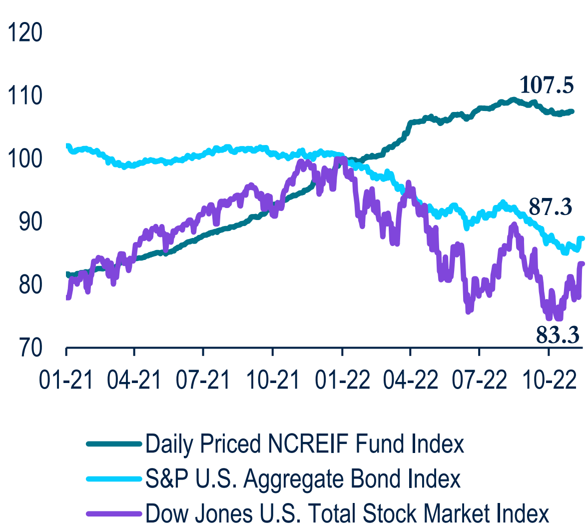
Reading the Public Market Tea Leaves: What's in Store for Private Real Estate Values?

Public equity and bond markets have already undergone significant repricing in response to higher interest rates and a deteriorating economic outlook. We are just starting to see the knock-on impact on private real estate values, with more to come for two reasons: portfolio rebalancing and a repricing of real estate cash flows.

First, substantial equity and bond market declines mean there will be less capital available for real estate investment as investors now find themselves overallocated to the asset class. Since 2015, institutional real estate exposure has consistently trailed target allocations. The opposite is now true due to simultaneous declines in bond and equity prices in 2022 (**Exhibit 5**). A hypothetical portfolio allocated 60%/30%/10% to equities, bonds and real estate at the beginning of 2022 would now require close to a 20% reduction in real estate exposure to rebalance (**Exhibit 6**).

Exhibit 5: Stocks and Bonds Have Repriced

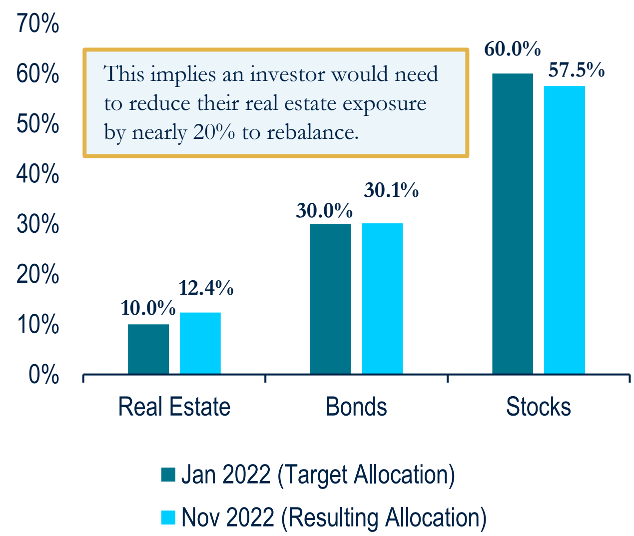
Total Return Index Across Investment Sectors (Jan 3, 2022 = 100)



Sources: NCREIF, S&P Global, PGIM Real Estate. As of November 2022.

Exhibit 6: Investors Are Over Allocated to Real Estate

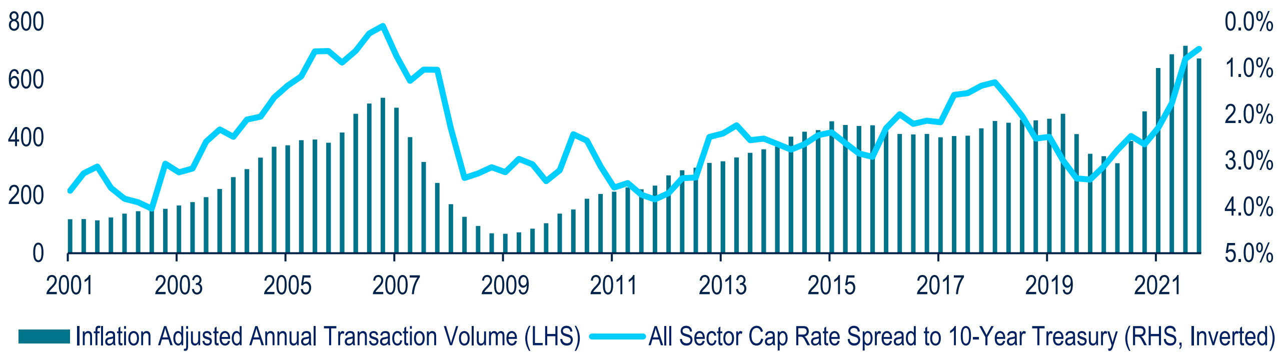
Model Portfolio Allocations (%)



The abrupt need to rebalance portfolios will place upward pressure on real estate yields, since the risk-free rate is much higher than it was at the beginning of the year. As shown in **Exhibit 7**, lower transaction volumes tend to go hand in hand with narrowing yield spreads vs. the risk-free rate, as would-be sellers are slow to adjust their pricing expectations to buyers' required yields. Assuming risk-free rates remain well above early-2022 levels, we expect owners to accept lower prices in the coming year.

Exhibit 7: Lower Transaction Volume Will Pressure Yields Upward

Transaction Volume ($ Billions) vs. Yield Spread to Treasury

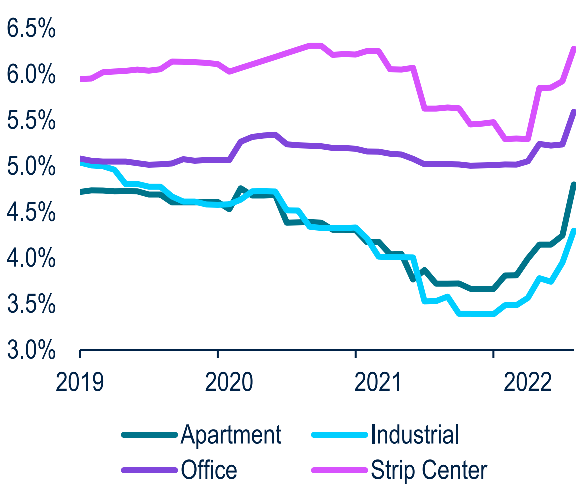


Sources: NCREIF, Oxford Economics, Real Capital Analytics, PGIM Real Estate. As of November 2022.

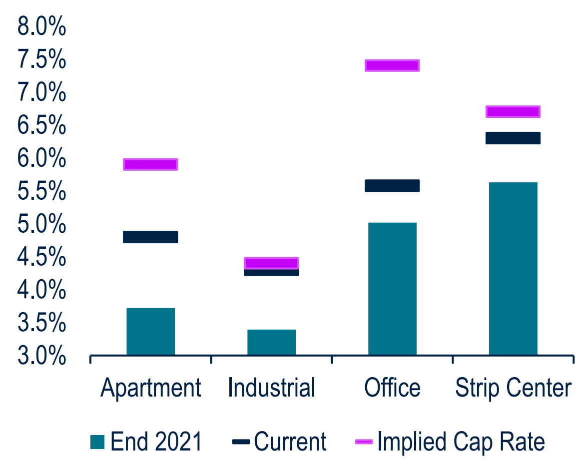
Second, given the rapid repricing already experienced in public equity markets, real estate owners can look to REIT shares for where private market values may be heading. While estimates of cap rates in the transaction market have already moved up an average of 80 basis points (bps) across the Apartment, Industrial, Office and Retail (non-mall)[1] sectors , as shown in **Exhibit 8**, REIT shares indicate further price adjustments are on the way.

Exhibit 8: REIT Investors Expect Further Price Adjustments

U.S. Transaction Market Cap Rates*



U.S. Transaction Market Cap Rates vs. REIT Implied Cap Rates*



* Estimates from Green Street Advisors.
Sources: Green Street Advisors, PGIM Real Estate. As of November 2022.

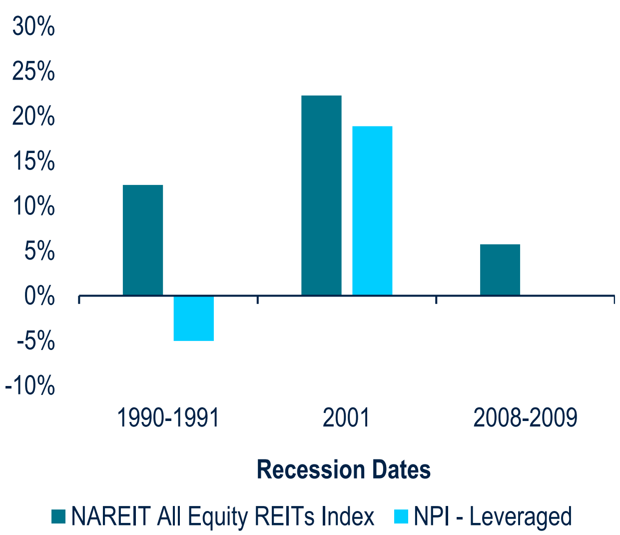
[1] Green Street Advisors, November 2022.

Comparing implied cap rates based on current REIT prices to estimates of spot cap rates in the market now, REIT share prices signal a further 100 bps in yield expansion on average. There is a far wider gap in the beleaguered office market than in other sectors, foreshadowing what could be sizeable value losses on the horizon for the property type.

Given the lagging nature of private real estate values, history tells us REITs offer an attractive entry point for real estate investors around turning points in cycles. Based on data from the three recessions between 1990 and 2009, the NAREIT All Equity REIT Index outperformed private real estate as represented by the NCREIF Property Index (on a leveraged basis) by an average of 8.8% per year in the five years from the start of a recession (**Exhibit 9**).

Exhibit 9: REITs Offer an Attractive Entry Point

Annualized 5-Year Forward Return From Start of Recession

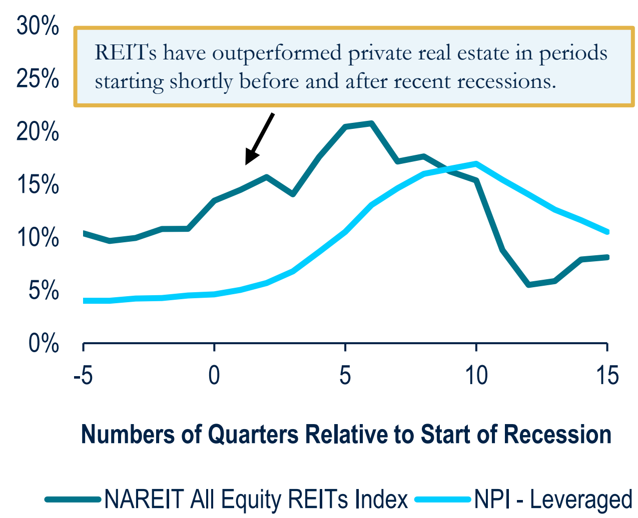


*2020 recession is excluded given the lack of a long enough return history so far.
Sources: NCREIF, PGIM Real Estate. As of November 2022.

By comparison, the difference in long-term (1983-2022) average annual returns between the two series is just 0.5%. As shown in **Exhibit 10**, even if an investor's entry point is a few quarters before or after the start of the recession, REITs have still on average produced higher five-year forward returns.

Exhibit 10: REITs Provide Opportunity Around Downturns

Annualized 5-Year Forward Return, Average of Past 3 Recessions*



*2020 recession is excluded given the lack of a long enough return history so far.
Sources: NCREIF, PGIM Real Estate. As of November 2022.

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Important information *(continued)*

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