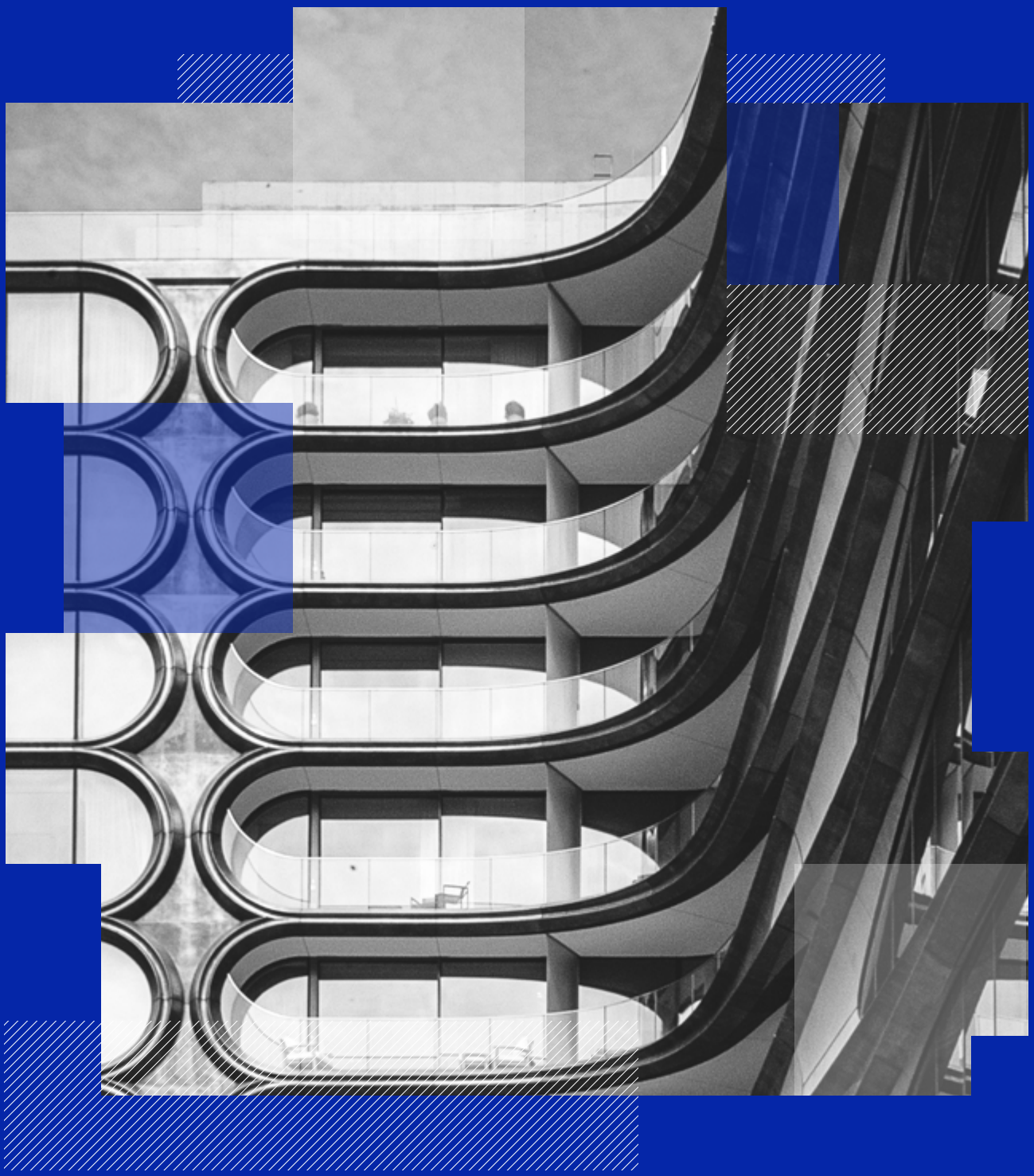
Real Estate Research Snapshot

2020 Part 1



MSCI

Introduction

Welcome to the MSCI Real Estate Research Snapshot: a compendium of the best applied research and thought pieces since the beginning of the year

WILL ROBSON
Executive Director, Global Head of Real Estate Solutions Research

At the start of the year I suggested that 2020 may prove to be a watershed year in terms of the way investors consider real estate as an asset class. On the face of it, it seems that due to the ongoing COVID-19 pandemic I may have been right, albeit for entirely different reasons.

No one could have predicted just how disruptive and broad-based the impact of the COVID-19 pandemic was going to be. However, the ensuing crisis does highlight how real estate is inextricably linked to other financial markets, the broader economy and society around it. These links are at the heart of the emerging trends we identified for 2020.

The emerging trends span a broad range of topics, each having the potential to have a profound impact on real estate investing. They all appear more relevant, rather than less so in the context of COVID-19. For instance, the first of the five trends focuses on Climate Risk. Some commentators have raised concerns that climate change may take a back seat whilst society grapples with coronavirus. However, our recent discussions with real estate asset owners and managers suggest increased focus on addressing climate change within their investment decision making processes. This increasing relevance runs right the way through to the fifth trend: Real Estate Doesn't Exist in in a Vacuum. During periods of economic and financial market disruption, the performance of property portfolios have historically come under severe stress. Investors are thirsty for analysis and insight about what risk factors they are exposed to across their multi-asset portfolios and how these are driving their real estate returns as we navigate through this turning point.

Whilst the nature of the research we have published through the first half of 2020 has tilted its focus toward the COVID-19 crisis, all the research in this snapshot still relate to the emerging trends we set out at the start of 2020:

Climate risk: getting to the bottom line

From abstract to urgent; why climate risk is today's priority even in the face of COVID-19...

Is your property portfolio fit for a society that is decarbonising? Have you considered how attractive your properties may be in a world experiencing climate change? Beyond protecting against acute, physical risks like wildfire, or even safe guarding for longer-term chronic risk, such as rising sea levels... climate change presents significant and perhaps more immediate transitional risk for real estate investors. Improved financial metrics can be essential to embed such risk analysis into investment decision making.

Places are for people: social impact investing

Where do social impacts factor into your investment process? Inner-city regeneration projects can be beneficial for both investors and society, increasing local employment, or perhaps creating more affordable housing. On the flip-side… a city's social issues effect their attractiveness to potential inhabitants and may influence asset returns. COVID-19 has only highlighted the relevance of public health resilience at city, state and national levels.

Investors are thirsty for analysis and insight about the risk factors they are exposed to

The many dimensions of real estate risk

Top-down vs. bottom-up analysis: a meeting of minds…

You work hard to analyze and manage specific risks to your assets. But do you ever feel like you are only seeing half the picture? With real estate now occupying a greater slice of asset-class portfolios, investors may wish to monitor the effects of high-level macro issues such as the economic impact of COVID-19 in tandem with asset-specific risk analysis to evaluate a fuller picture.

Beyond location, location, location

What lies beneath: there is more to real estate performance than location and purpose

Do physical asset and cash-flow characteristics factor into your top-down, strategy formation? Nonmarket performance drivers such as lease length or vacancy are often no longer considered idiosyncratic to individual assets and attributed to stock selection. With rental markets becoming weaker across many markets as a result of COVID-19, the systematic risk associated with lease length is becoming clearer. As increasing data is generated, and technology developed, many more drivers of performance beyond sector and geography will be measured and managed systematically.

Everything is relative, and only that is absolute

How market forces impact the asset and the portfolio...

When it comes to your real estate investments, context may be key to the perception of 'good' performance – especially during such turbulent times as we are now facing. What level of risk did you take? How much did the market buoy returns? How did the real estate help diversify the broader portfolio? Investors may seek answers to these questions by relative market analysis within and across asset classes. To do so, real estate investors may need to evolve to take their data and analytics to the next level. ●

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What's driven capital growth in real estate portfolios?

BRYAN REID
Executive Director, Real Estate Solutions Research

Can investors really know what has driven the performance of real estate portfolios? Capital-growth decomposition — i.e., breaking capital growth into drivers like yield movements and income growth — may help answer that question.

Capital growth helps tell the story of portfolio performance

Capital growth has historically been more volatile and less predictable than income return in MSCI's private real estate indexes. For that reason, there is often a demand to better understand what has driven capital growth. Using a simulated portfolio of U.K. property assets and measuring its performance against the MSCI UK Quarterly Property Index, we demonstrate how capital-growth decomposition can shed light on the drivers of portfolio performance. In this exercise, we decomposed capital growth into four components based on equivalent yield.[1]

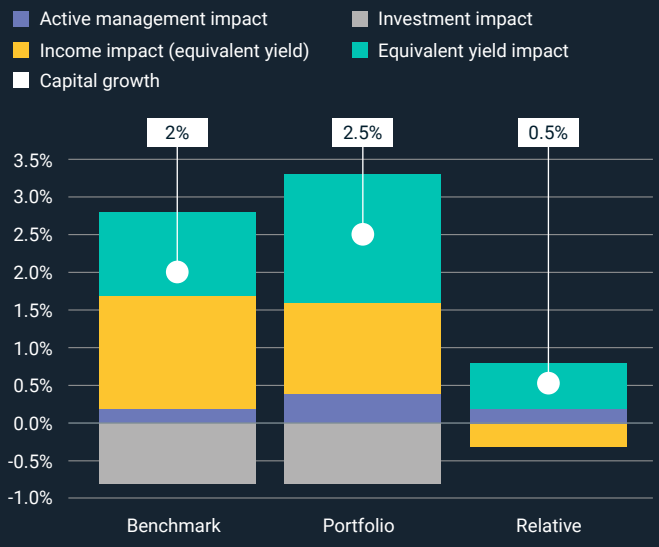
The first component, active-management impact, represents how much transactions and developments contributed to capital growth. Equivalent-yield impact shows how much the change in asset values was attributable to movements in equivalent yield. Income impact represents how much of the change in asset values came from growth in initial and expected rental income. (Added together, the equivalent-yield impact and income impact show the total change in asset values.) And the investment impact, the difference between asset-value growth and capital growth, equals the amount of capital expenditure reinvested in the hypothetical portfolio.

- In real estate investing, capital growth has historically been more volatile and less predictable than income return and has therefore been responsible for most of the observed variability in total returns.
- Investors looking to monitor and evaluate their portfolio's capital growth may use a suitable benchmark to calculate relative returns, which can help identify areas of under- or outperformance.
- Decomposing relative capital growth provided additional context that helped shed light on what has driven relative performance, and how much could be attributed to variables like yield compression and income growth.

[1]As this blog post examines a simulated U.K. portfolio, our decomposition is based on equivalent yield, the most commonly used yield in the U.K. market. Capital-growth decomposition could also be performed using other yields.

Exhibit 1: Decomposing capital growth shows drivers of return

3-year annualized return / impact



A simulated U.K. real estate portfolio's three-year annualized figures to September 2019. Source: MSCI Real Estate Enterprise Analytics

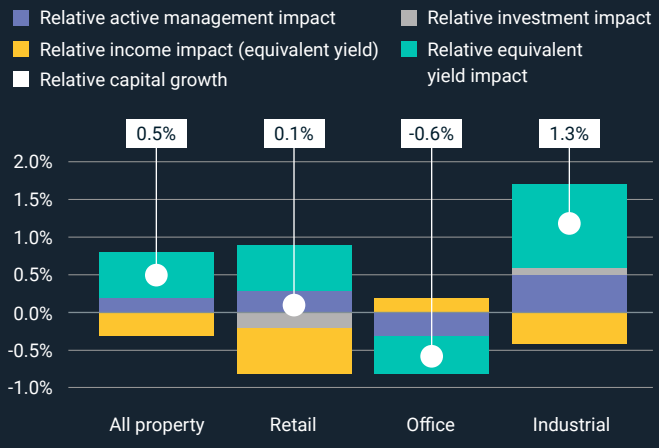
In the example here (Exhibit 1), we observe that the simulated portfolio achieved higher capital growth than the benchmark over a three-year period ended September 2019. The drivers of capital growth in the portfolio also differed from those of the benchmark. For the benchmark, the largest driver was income impact; but in the simulated portfolio, it was equivalent-yield impact that provided the largest positive contribution. Active-management impact also played a bigger role for the portfolio than it did for the benchmark.

From these results we can infer that the hypothetical portfolio outperformed the market in terms of transaction and development activity, as well as in terms of equivalent-yield compression, but that income growth acted as a drag on relative performance. An investor reviewing these results may decide to increase their focus on income growth in the portfolio. The fact that the primary driver for the simulated portfolio was different from that of the benchmark provides a useful illustration of why it may not always make sense to try to explain the performance of a portfolio using broader market trends.

It may not always make sense to try to explain the performance of a portfolio using broader market trends

Exhibit 2: Segmenting portfolios for additional insight

3-year annualized relative return / impact



A simulated U.K. real estate portfolio's three-year annualized figures to September 2019. Source: MSCI Real Estate Enterprise Analytics

The story can differ within the portfolio

We next broke down the hypothetical portfolio and benchmark into consistent segmentations to delve even deeper into what drove relative capital growth for different parts of the portfolio (Exhibit 2). The exhibit segments properties by sector to show how the drivers of relative capital growth varied within the simulated portfolio. As the exhibit highlights, the impacts' magnitudes and directions can vary, so it may be useful to understand these more granular trends. For example, unlike the overall portfolio, the office exposure actually outperformed in income growth, but did not benefit as much as the wider market from yield compression, suggesting that a different focus may be required for this part of the hypothetical portfolio.

As the results demonstrate, decomposing capital growth can show what has driven growth in a hypothetical portfolio, how those drivers compare to the wider market and whether there are differences within the portfolio. Given the important role that capital growth plays in real estate portfolios, capital-growth decomposition may therefore be a useful part of a performance-benchmarking process.

Real estate is about more than location during uncertain times

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Senior Associate, Real Estate Solutions Research

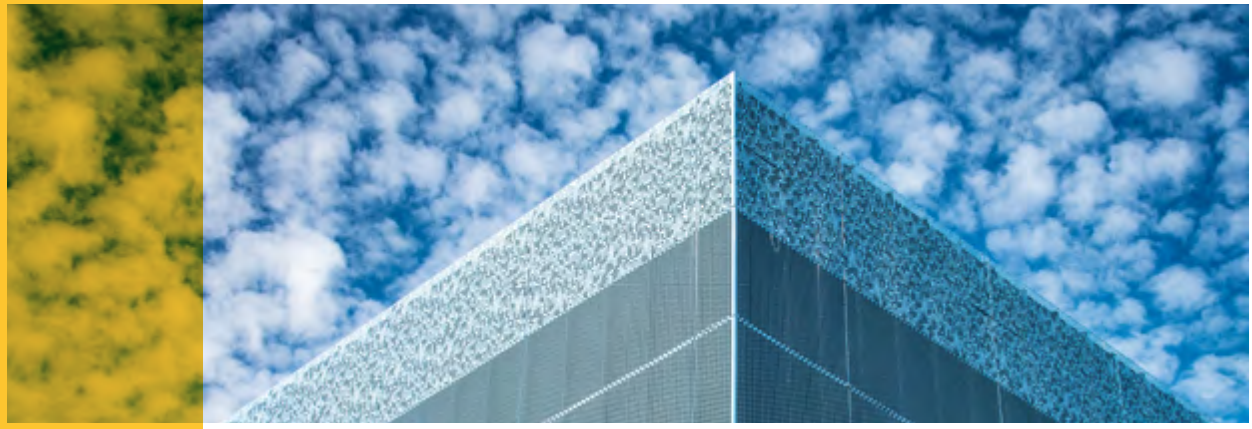
In 1956, California's Van Nuys News proclaimed the three most important things about real estate to be location, location, location.[1] In the 64 years since, asset-specific risk and high-level macro issues have become increasingly important considerations, as have understanding what drives risk and return in this complex and diverse asset class and how it correlates with others.

Fast-improving technology and the evolution of big data have meant that a higher volume of information can be processed more efficiently in helping investors understand risk and return drivers and aid portfolio construction. Lease structures and the quality of tenants have often been among the key drivers of growth and resilience of cash flows. This blog investigates the impact lease length has had on relative investment performance in both rising and declining markets. The ongoing global spread and negative impact of the novel coronavirus may be an example of a scenario where the significance of lease lengths could come to the fore.

Real estate investors' white WALE?

Historically, past performance in real estate has primarily been explained in terms of property type and geographic exposure. But there are many other potential factors that can help explain real estate performance. Our analysis found that lease length has been one such cyclical factor.

- Investors often think of their real estate exposure in terms of property type and geography, but there are many other potential factors that may help explain performance.
- Our analysis shows lease length has historically been one such cyclical factor, with long leases having provided a performance boost during periods of weakening rental growth – an insight that may prove particularly relevant in today's economic environment.
- Investors may wish to benchmark more than just property type and sector exposure.



The exhibit below shows the annual total return of the MSCI UK Quarterly Property Index segmented by remaining lease term. For the purposes of the analysis, shorter- and longer-lease properties are defined as those with a remaining lease term in the bottom and top quartiles per period, respectively.

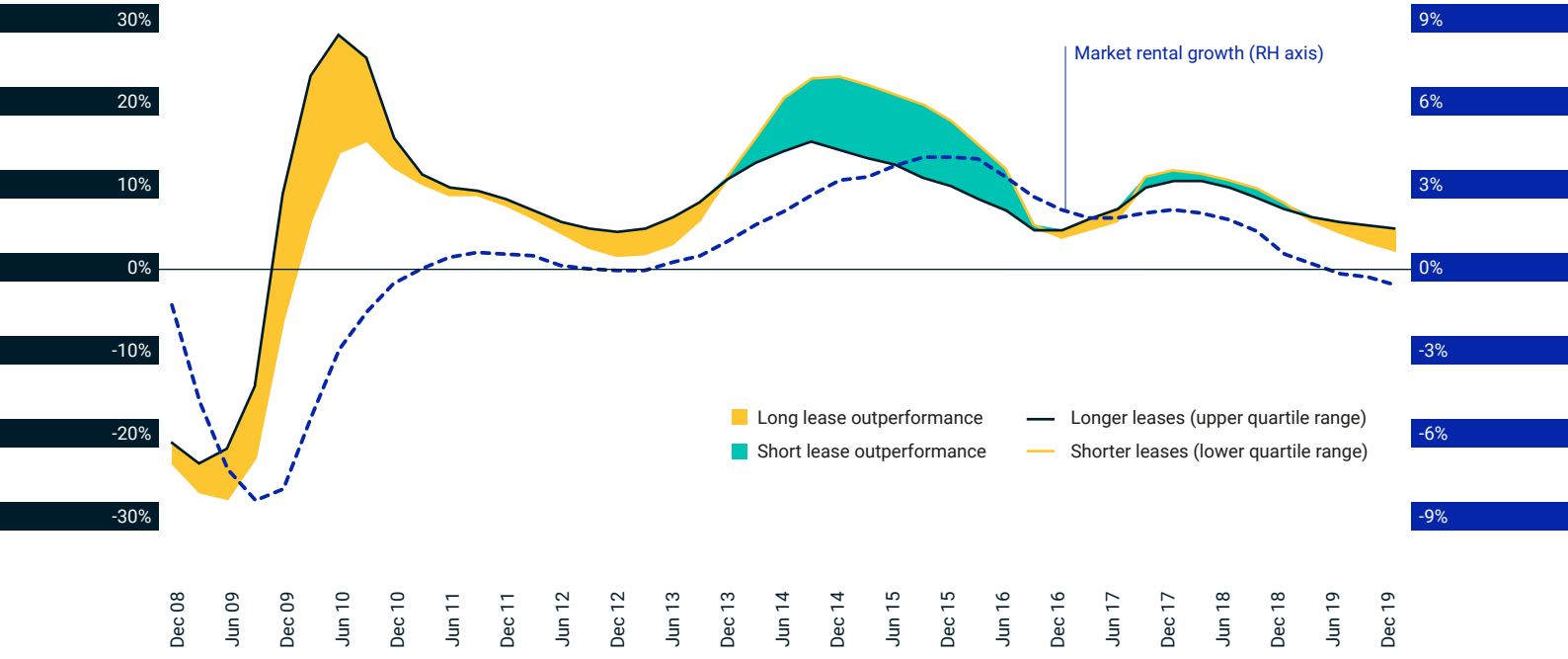
Looking back to 2008, longer-lease real estate assets provided a performance boost during declining market periods, since properties with a longer weighted-average lease expiry (WALE) were likely to be more insulated from negative reversionary potential. On the flipside, longer-lease assets depressed returns during rising markets, as properties with a drawn-out expiration profile were less able to capture reversionary upside through active management intervention, compared to properties with a shorter WALE.

In the five-year period after the global financial crisis, long-lease properties in the U.K. delivered an annualized total return of 9.6%, compared to the 5.2% of shorter-lease properties. By contrast, in the period from the first quarter of 2014 to the second quarter of 2016, shorter-lease assets stole the limelight, courtesy of buoyant growth in market rentals. This came as the U.K. economy grew at its fastest rate for nine years in 2014. From the second quarter 2016 to fourth quarter 2019, longer-lease assets provided an extra 100 basis points (bps) in annual returns, aided by their reduced exposure to dilutionary lease events. Rental growth and returns were already weakening ahead of the coronavirus outbreak in the U.K., with longer leases beginning to outperform. We may see this trend accelerate as the pandemic begins to impact rental income (refer to chart below).

Looking back to 2008, longer-lease real estate assets provided a performance boost during declining market periods

Exhibit 3: Longer leases were a boost during weakening markets but a drag during rising markets

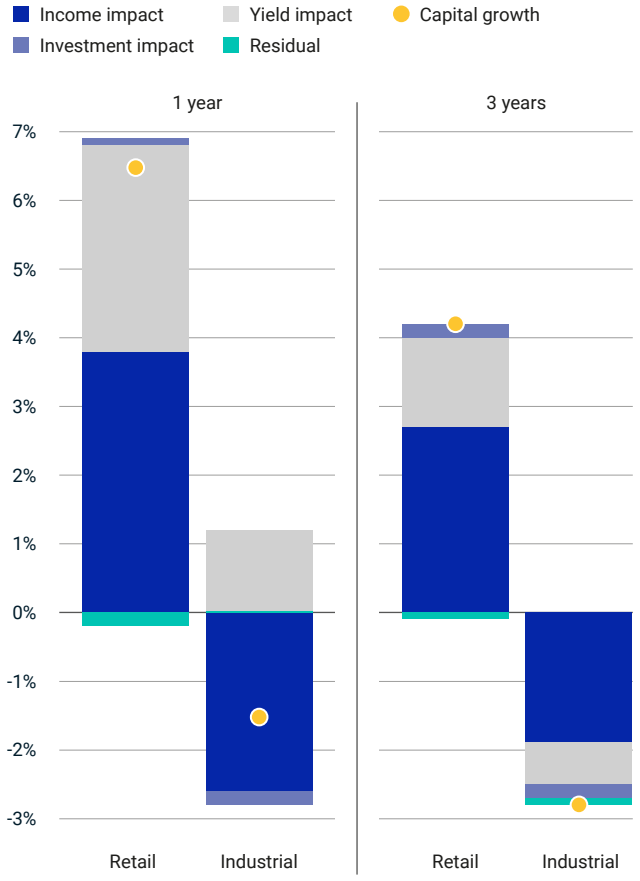
UK quarterly property index – total return (annual). All property; standing investments; by lease length



Source: MSCI Real Estate Global Intel

Exhibit 4: Income growth mattered most

Decomposition of relative capital growth – performance of long leases over short leases



Source: MSCI Real Estate Global Intel

Lease length improved sector returns

After the U.K. Brexit referendum, industrial property in the U.K. has had a strong run, delivering an annualized total return of 13.2% from June 2016 to December 2019, compared to the retail property sector's -0.3%.[2] However, retail properties with actively managed lease lengths, the outcome would likely have been more favorable. Over the same analysis period, long-lease retail property delivered an annualized total return of 5.3%, 380 bps in excess of the 1.5% annual return of shorter-lease retail assets, as its exposure to negative rental reversions would have been more contained. By contrast, shorter-lease industrial assets, with an annualized total return of 14.9%, outperformed longer-lease industrial property, which produced an 11.3% annualized return, based on the latter's higher exposure to accelerating market-rental growth.

The exhibit to the left shows the decomposition of the relative capital growth of long versus short leases for the retail and industrial sectors, annualized over various time periods. In more recent periods, much of the respective outperformance of shorter-leased industrial and longer-leased retail property was due to superior fundamental income growth as opposed to yield-compression-driven capital growth. This suggests that the relative exposure to potential rental reversion may have been the more significant driver of relative performance during the analysis period.

Assessing performance from all angles

With real estate now occupying a greater slice of multi-asset-class portfolios, investors have been looking beyond inherent property attributes such as sector and location as the key drivers of investment performance. In the same way that factor analysis has helped explain more systematic drivers of performance in the broader equities market, a similar analysis might be made of real estate assets. Factors such as lease length, which were previously perceived to have been attributed to idiosyncratic risk and stock selection, may be more systematic drivers of return than previously thought.

There has always been a need to understand the drivers of risk and return in investment portfolios; but as investors face an increasingly uncertain COVID-19-impacted world, the more factors we can analyze to understand performance and help position portfolios, the better.

[1] Safire, W. '*On Language: Location, Location, Location.*' *New York Times*, Jun. 26, 2009.

[2] According to the MSCI UK Quarterly Property Index

What out-of-cycle write-downs may mean for real estate yields

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As the COVID-19 pandemic continues to take its human toll and disrupt global economies, real estate investors have been seeking to understand what impact the crisis could have on their portfolios. Recently, several large Australian pension funds took the decision to do an out-of-cycle valuation write-down on their portfolios of up to 10%.[1] Using the Property Council of Australia/MSCI Australia Annual Property Index, we can investigate how a 10% write-down compares to past asset-value declines and what that might imply for yields under different scenarios for net-operating-income (NOI) growth.

- Several Australian pension funds recently announced an out-of-cycle valuation adjustment to their real estate portfolios, writing down asset values by up to 10%.
- We extrapolated what this information could mean for Australian real estate yields under different income-growth scenarios and compared the results to past corrections.
- A 10% write-down in our scenarios could indicate that asset values return to levels last seen in late 2017, but imply a relatively modest increase in yields compared to the global financial crisis or the early 1990s recession.

Putting the 10% in historical context

The Property Council of Australia/MSCI Australia Annual Property Index dates back more than 30 years, to December 1984 — yet there have been only two periods in which overall asset values declined during that time. The first was in the early 1990s, when an economic recession and over-supply caused asset values to fall 32% (between December 1989 and September 1993). The second was during the 2008 global financial crisis, when asset values declined 13% (between March 2008 and December 2009).

During the early 1990s, we estimate that declines in NOI contributed approximately -6% to the fall in asset values, while repricing — as measured by increases in NOI yield — contributed approximately -27%. During the financial crisis, Australia's overall economy was insulated from the worst effects by a natural-resources boom, which helped maintain GDP growth. As a result, NOI growth remained positive through the crisis, and we estimate that it provided a positive 5% contribution to asset-value growth in real estate portfolios. However, the disruption in financial markets saw NOI yield expand from 6.0% to 7.2%, contributing an estimated -17% to asset-value growth.

In the context of these two past corrections, a 10% write-down is more comparable to what was observed in the late 2000s; and if a 10% write-down were applied to the overall Property Council of Australia/MSCI Australia Annual Property Index, our models indicate that under the same parameters, values would return to levels last seen in late 2017.

Past corrections against different 10% write-down scenarios

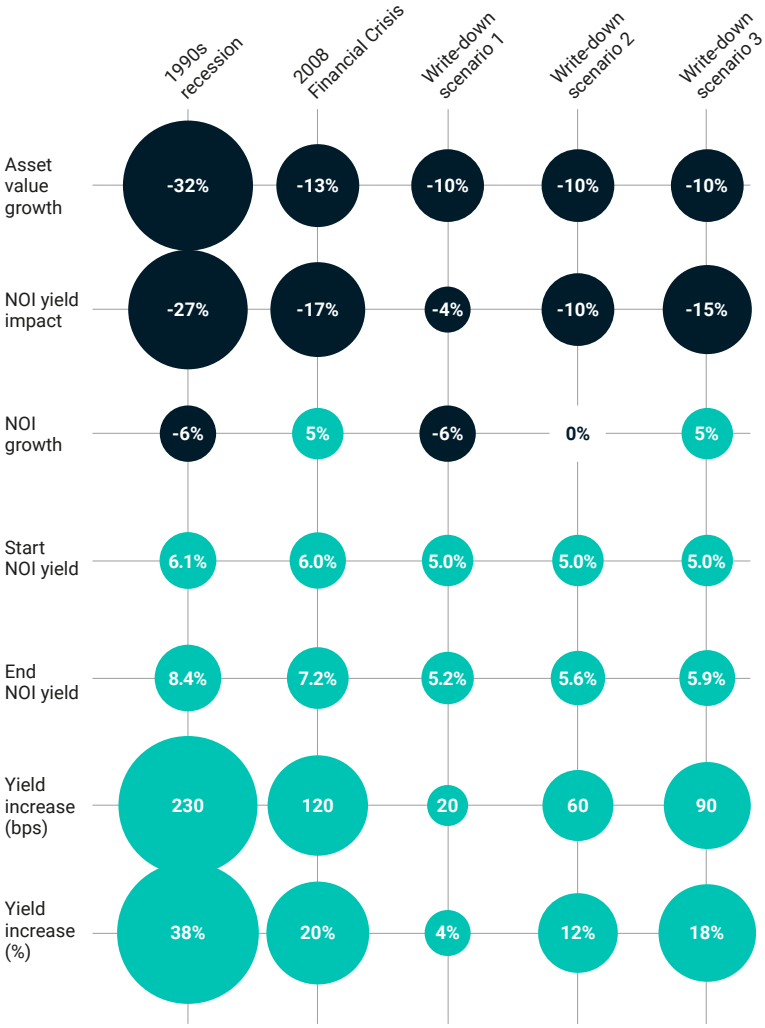
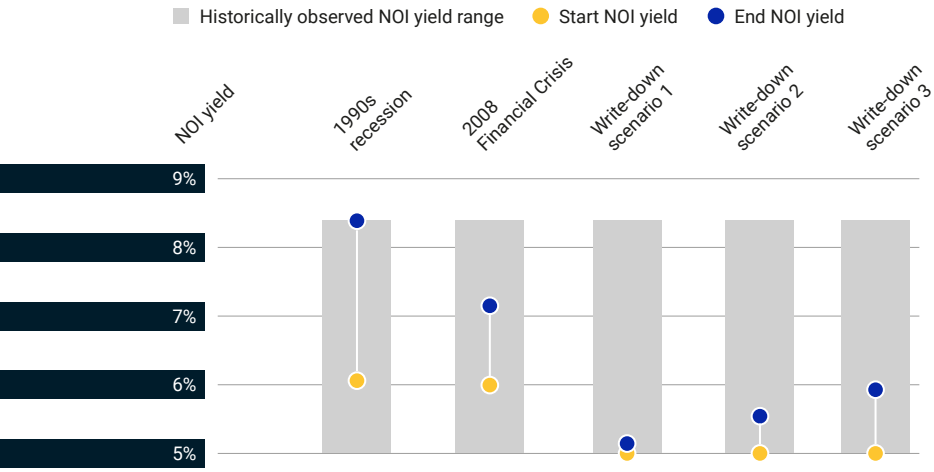


Exhibit 5: Visualizing yield movements



How would a 10% write-down affect yields in this model?

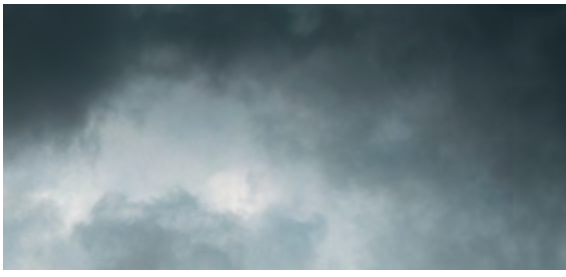
If we assume a 10% reduction in asset values, we can see what that could imply for NOI yields under different scenarios for NOI growth. In December 2019, NOI yields reached a record low of 5.0%, so a 10% reduction in asset values would imply an approximately 60-basis-point (bp) increase in yield, assuming no NOI growth under the same conditions. If, at the same time, NOI were to fall by 6% (as happened in the early 1990s), the implied increase in NOI yield would only be approximately 20 bps. But if NOI growth remains positive and grows at the same rate observed during the financial crisis, our test implied an increase in NOI yield of approximately 90 bps.

In all three test scenarios, NOI yields remain below 6% — still lower than before the financial crisis. Further, the increase in NOI yield, in absolute as well as proportional terms, remains lower than in past corrections.

The full impact of COVID-19 on real estate portfolios will take time to understand

As uncertainty over COVID-19 looms over global markets, we can't determine what the full implications for real estate markets will be. We used historical data and scenario analysis to test different possible outcomes — and potentially gain a better sense of real estate portfolios' sensitivities and risks. Understanding what changes in NOI growth or yield could imply for asset values, or vice versa, may help investors gain a clearer picture of the times ahead.

[1] Mather, J. 'Super funds slash the value of unlisted assets in 'unique' times.' *Australian Financial Review*, March 24, 2020.



How COVID-19 could **impact** private real estate values

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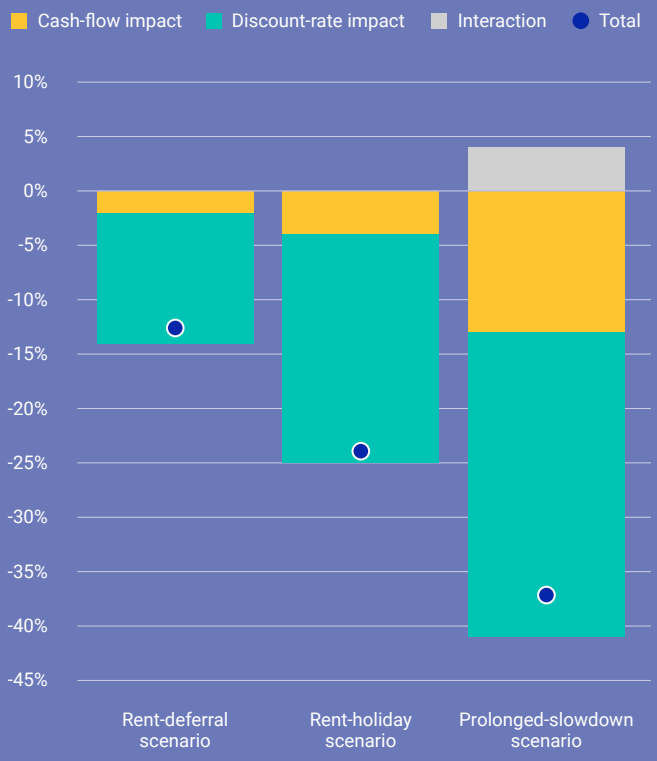
The COVID-19 pandemic has already had a notable impact on public equity markets, with the MSCI ACWI Index declining by just over 20% for the first quarter of 2020. By contrast, the impact on private markets such as real estate has been harder to establish. As a private asset class with lease structures and investment-hold periods that typically extend over multiple years, as well as a reliance on relatively infrequent appraisals, it has historically taken longer for adjustments to play out.[1] However, real estate has not historically been immune to growth shocks. Discounted-cash-flow (DCF) scenarios may help investors better understand the potential sensitivity of their portfolios to those shocks.

Defining and comparing discounted-cash-flow scenarios

To demonstrate this approach, we define several hypothetical scenarios in the MSCI Valuation Scenario Model and compare them against the result of a hypothetical base case. The MSCI Valuation Scenario Model is a DCF-based tool. It derives cash flows based on growth expectations over short, medium and long horizons, which follow an auto-regressive process with mean-reverting features and discounts forecast cash flows with the expected risk-free rate and risk premium. By comparing valuations from scenarios with varying projections for growth and discount rates, the model analyzes the impact of growth shocks and discount-rate shocks on valuations.

- Longer investment horizons and a reliance on appraisals may mean that private real estate does not react to shocks as rapidly as public markets. However, this does not mean the asset class is immune to those shocks.
- As the COVID-19 pandemic continues to take its human toll and disrupt global economies, many real estate investors have been seeking to understand what impact the crisis could have on their portfolios.
- We used MSCI's Valuation Scenario Model to show how discounted-cash-flow models could be used to explore the impact the crisis could have on asset values. In the hypothetical scenarios we created, asset values declined between 13% and 37% highlighting how sensitive the outcomes can be to changes in assumptions.

Exhibit 6: Comparing the hypothetical scenarios to the base case shows the potential impact on asset values



Much of the media's discussion to date has focused on the negotiations taking place between tenants and landlords and the potential for landlords to grant tenants relief in the form of rent deferral or rental holidays. For that reason, we have built our scenarios around these possibilities.

- In the base case, cash flows are assumed to grow at 3% per year and are discounted with a risk-free rate of 1% and a risk premium of 6%.
- In the first hypothetical scenario, we model a rent deferral where 95% of cash flows from the first six months are deferred. The risk-free rate falls to 50 basis points (bps), but the risk premium increases to 7%.
- In the second hypothetical scenario, we model a rent holiday with the same 95% reduction in cash flows over the first six months but the foregone income is not recovered. The risk-free rate falls 50 bps, but the risk premium increases to 7.5%.
- The final hypothetical scenario is the same as the rent holiday, but we model a more prolonged slowdown by reducing medium-term growth to 2% and increasing the risk premium to 8%.

Compared to the base case, under the rent-deferral scenario, the model shows asset values falling 13%. In the rent-holiday scenario, the model shows asset values fall 24% and in the prolonged-slowdown scenario, according to the model, the implied asset value falls by 37%. The model also calculates a cash-flow impact and a discount-rate impact, with the former applying the base-case discount rate to the hypothetical scenarios' cash flows and the latter applying the scenarios' discount rate to the base-case cash flows.

In the three hypothetical scenarios we've modeled in this analysis, the impact of the changes to cash flows on their own could result in asset-value declines between 2% and 13%. The changes to the risk-free rate and risk premiums in isolation implied a reduction in asset values of 12% to 28% (Exhibit 6).

One thing to note in this analysis is that, while much of the public discussion to date has focused on the potential short-term disruption to income, the cash-flow impacts from the rent-deferral and rent-holiday scenarios, as modeled, are relatively small. Reductions to longer-term cash-flow expectations or changes to the discount rate had a much bigger impact on the results. This illustrates why some may want to consider what effects these variables could have on portfolios, in addition to the immediate disruptions to near-term cash flows.

Addressing uncertainty

With the situation evolving rapidly, there is still much uncertainty about how the crisis will impact the cash flows of real estate assets and financial-market conditions.

The above scenarios are not meant to be predictions, but to illustrate how investors can use tools like the MSCI Valuation Scenario Model to explore how sensitive a portfolio might be to changes in assumptions about growth and discounting. This sort of approach could be applied to the overall portfolio, but also to different segments within a portfolio. For example, the office exposure could be analyzed separately to the retail exposure, or the analysis could be applied to individual assets. In defining scenarios for this kind of analysis, investors can draw on their own internal underwriting assumptions, but the use of historical market data may also be helpful. It could be used to either define scenarios based on previous shocks or contextualize the assumptions applied to the current crisis.[2]

[1] For example, in 21 national market corrections we explored, the median peak-to-trough timing was 3.5 years. Reid, B. "What's the downside in real estate?" MSCI Blog, Oct. 4, 2019.

[2] For an example of how historical data can be used to provide context to scenarios, see: Reid, B. "What out-of-cycle write-downs may mean for real estate yields." MSCI Blog, April 3, 2020.

Real estate asset selection mattered — especially in a crisis

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Real estate, along with politics and sports, must be one of the world's favorite obsessions. There is often plenty written about the wider trends shaping real estate markets and no shortage of opinions. In the current crisis this may be especially true. But real estate is a heterogeneous asset class: Every property is unique, and no two portfolios will provide the same returns.

Similar statements apply to individual real estate portfolios, which can be shaped by a number of specific factors that will influence performance relative to the broader market. The use of attribution analysis may help investors understand and communicate their relative performance, separating the impact of allocation differences from the impact of asset selection within those allocations, and providing the means to position performance within the context of wider market trends. Our analysis of historical allocation and selection scores from actual portfolios suggests that asset selection may have been a particularly important driver of relative performance, especially in times of crisis. With the COVID-19 pandemic expected to continue causing considerable disruption to real estate markets, attribution analysis may be a useful tool.

- Analyzing 94 actual portfolios from 2008 and 2019, we find asset selection accounted for anywhere between 60% and 78% of tracking error between portfolios and benchmarks over any given year.
- During past market disruptions, such as the 2008 global financial crisis, variation in both allocation and selection increased, but the increase for selection was more pronounced.
- With the COVID-19 pandemic causing unprecedented disruption, attribution analysis may be a useful tool for helping investors understand and explain what drove returns in their real estate portfolios.

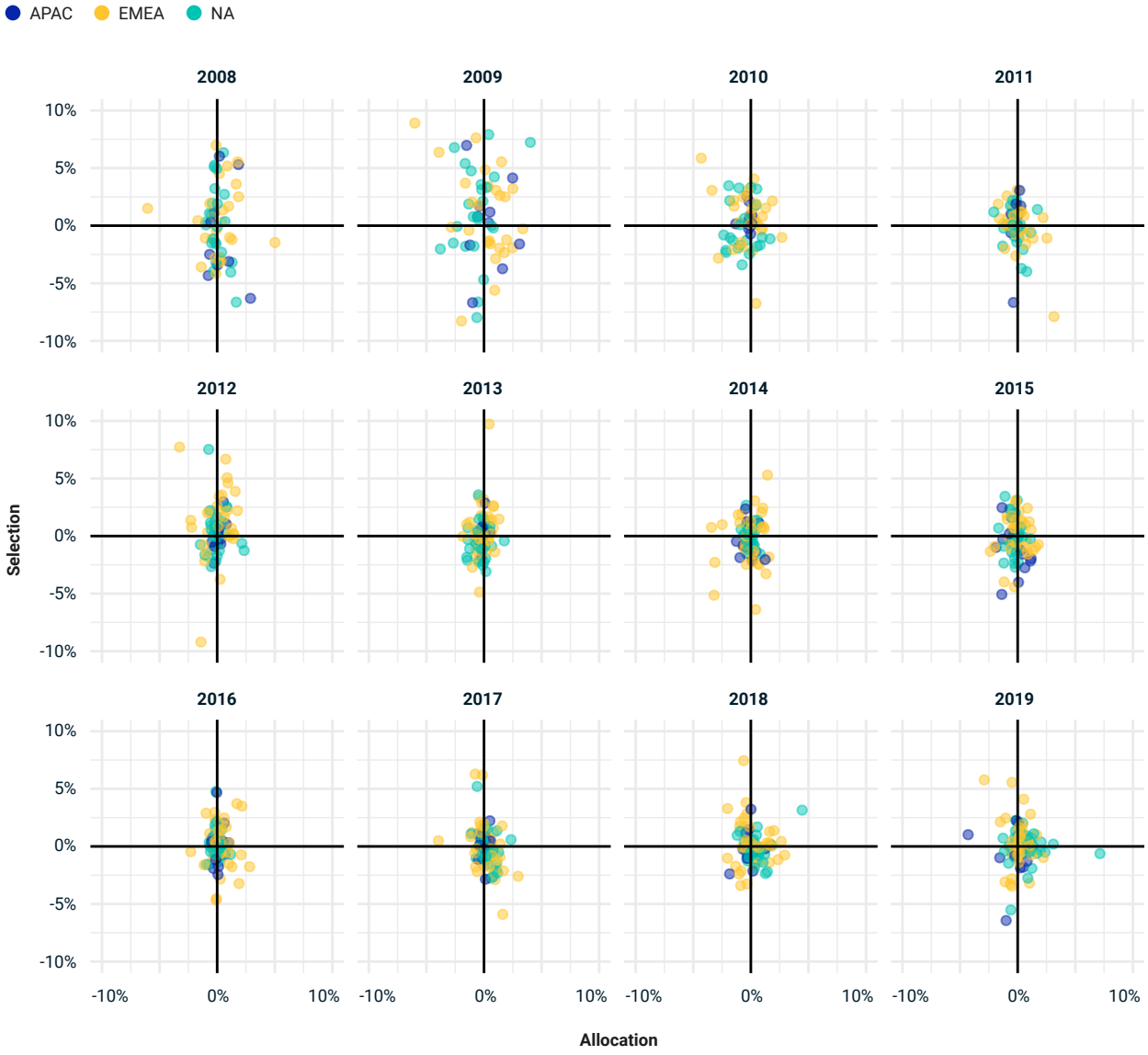
Attributing relative portfolio performance

Asset-level attribution analysis can help investors understand the reasons for a portfolio's outperformance or underperformance versus an index. It breaks down the relative return into structure- and property-specific scores, allowing the influences of submarket allocations and asset selection to be distinguished.

Specifically, attribution analysis distinguishes that part of the relative return derived from the portfolio's weightings in strong or weak sectors of the market (allocation), from that part derived from the performance of the assets in the portfolio within each segment of the market (selection).

Using data from 94 real portfolios we explored how allocation and selection scores contributed to relative returns between 2008 and 2019. Over the entire analysis period, selection accounted for 70% of the annual tracking error between portfolios and benchmarks, with its contribution ranging from a low of 60% in 2018 to a high of 78% in 2016.

Exhibit 7: Selection accounted for 60% to 78% of observed tracking error in any given year



During periods of market stress like the 2008 global financial crisis, as the spread in relative returns between portfolios increased, we observed more variation in both allocation and selection scores. However, the increase tended to be greater for selection, meaning that it tended to account for more tracking error in these years.

Why the lower contribution from allocation?

One potential explanation for the lower contribution we observed from allocation could be that real portfolios are built and managed while referencing benchmark weightings that may constrain the allocation scores. Another explanation may lie in the construction of benchmark segmentations themselves. Traditionally, segmentations have been built along property type and geography lines, but underlying these groupings may be additional systematic drivers of return that could be used to construct alternative segmentations, which, if implemented, could potentially increase how much tracking error is explained by allocation.

Putting portfolios into a broader market context

As strategies become more sophisticated and investors demand more insight into the drivers of risk and return in their portfolios, attribution analysis may provide valuable insights. Our analysis showed that asset selection played an important role in driving the relative returns of real estate portfolios from 2008 to 2019, particularly during periods of disruption. With the COVID-19 pandemic causing unprecedented disruption, attribution analysis may be a useful tool for understanding and communicating the idiosyncratic aspects of portfolios.

COVID-19 and real estate: the devil is in the dispersion

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As the old adage goes, economic expansions don't die of old age. This most recent expansion is no different. Many real estate markets were showing signs of a slowdown before anyone had heard of social distancing. But the COVID-19 crisis seems to have been this cycle's grim reaper.

Has this correction been similar to previous ones? The 2008 global financial crisis (GFC) is an obvious comparison due to its global nature. The GFC was marked by synchronized declines across real estate sectors. That decline stands in stark contrast to today's performance landscape, where long-running structural changes to the use of retail and industrial space have caused very different investment outcomes over recent years. The more recent impact of COVID-19 has merely accelerated these trends.

What remains similar, though, is that the dispersion of returns within underperforming sectors, such as retail, is widening. This cross-sectional dispersion of returns highlights the importance of asset selection and taking a more granular analysis of performance within segments and sectors. This way, real estate investors can better understand potential drivers of returns. To illustrate, we looked at data from four markets in different global regions: the U.S., U.K., Netherlands and Australia.

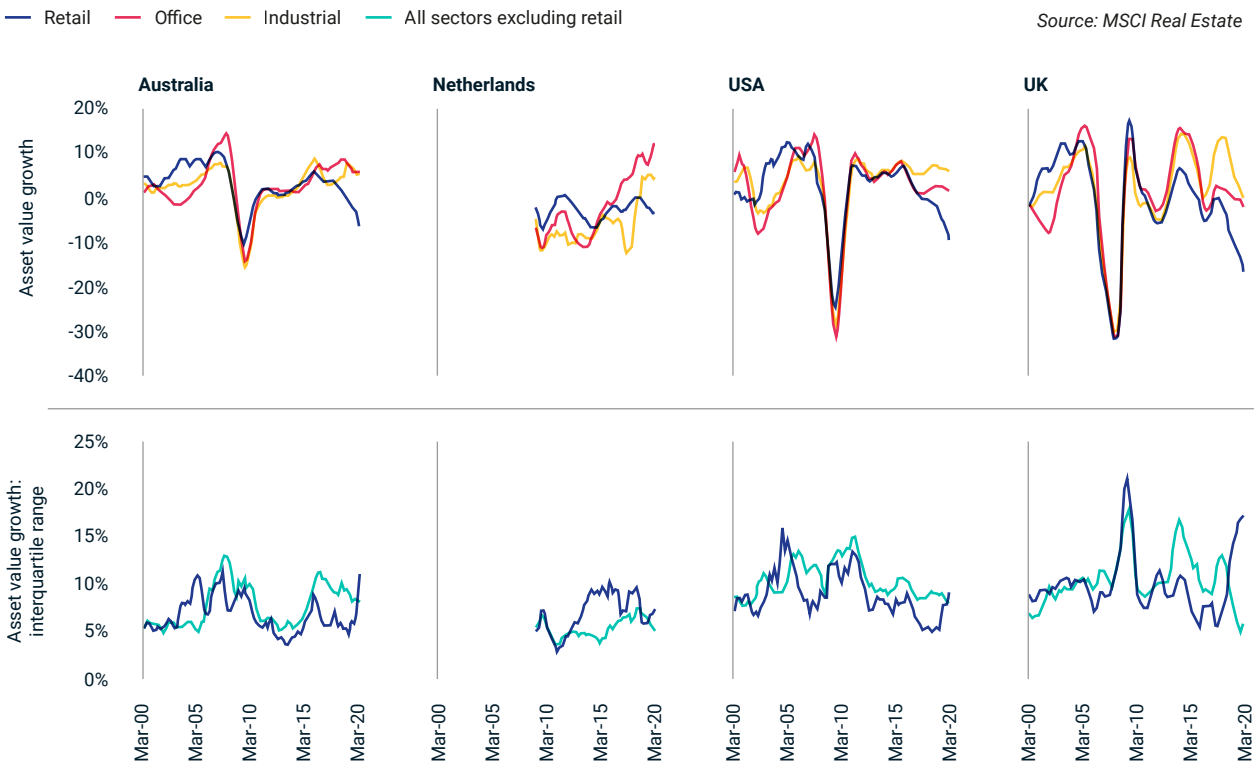
COVID-19: a secular or pervasive crisis for real estate?

Real estate returns began declining more sharply when COVID-19 started affecting global markets. As we've noted, its real estate impact has been more localized, unlike during the GFC. The key difference: The drop in asset-value growth and widening performance dispersion have so far been more sector-specific, with retail the hardest hit, as can be seen in the following exhibit (Exhibit 8).

- The recent market turmoil has resembled the 2008 global financial crisis and other volatile periods, in that we have observed a widening of the dispersion of returns across real estate assets.
- This widening spread has been most pronounced in retail property — a sector that was under pressure long before the COVID-19 pandemic — particularly in the U.K.
- Given the increased dispersion of returns, institutional investors may wish to pay closer attention to asset selection and conduct more granular performance analysis.

A combination of reduced overall consumer spending, mandatory lockdowns in scores of countries and significant uncertainty about the future of the sector weighed heavily on retail-property valuations. The interquartile range[1] in the following charts highlights how periods of high uncertainty may be reflected in increased dispersion of returns, whether with broad co-movement of sectors and geographies, as we saw during the GFC, or on a localized basis. (For example, the U.K. experienced a wider returns dispersion after the Brexit referendum in June 2016.) The current widening of the interquartile range echoes the GFC insofar as that such wide dispersions, even limited to certain sectors or geographies, have been uncommon outside periods of significant market volatility. And it reminds us that, on an asset level, real estate performance can be highly varied during periods of heightened uncertainty.

Exhibit 8: Asset-value growth slowed and dispersion widened, especially in retail



We are still in the early days of seeing how COVID-19 may play out for real estate

It is important to note that the weakness in retail real estate predates the COVID-19 crisis. In all four markets we examined, asset-value growth in retail either peaked before the GFC or briefly surged during the subsequent recovery (in the U.K.) before embarking on its secular decline. In recent years we've seen that the interquartile range of asset-value growth tends to spike when that growth reaches a turning point or approaches zero. This seems relatively more pronounced for the retail sector. The relative weakness of retail versus other sectors is common across all four markets — and has been for quite some time.

The devil is in the dispersion

We are still in the early days of seeing how COVID-19 may play out for real estate. The data we used in this analysis was limited to the end of first quarter of 2020. Many lockdowns didn't start until March, and it remains to be seen how variants of continued lockdown across the globe impacted each of the property sectors.

What is, however, clear is that COVID-19 has already had an unequal impact on asset classes, geographies and sectors. If the individual assets or property types (e.g., shopping malls in retail) were more uniform within a given sector, one might expect that sector's overall returns to vary over time; but one would not expect dramatic shifts in the dispersion of returns, as we have seen during uncertain times.

In reality, we know that individual real estate assets vary along many dimensions (income duration, exposure to tenant industries and their credit strength, to name just a few). Each of these characteristics may determine how quickly and to what extent the assets' returns are impacted by broader market movements like those created by COVID-19.

A widening performance dispersion within real estate sectors and geographies reminds us that not all assets are created equal within these broader classifications. In particular, it is a reminder that asset selection has long played an important role in the real estate investment process — and that an in-depth analysis of more granular data, at the sub-sector or even asset level, can help investors understand the factors that really drove performance.

[1] Interquartile range is the difference between the 75th and 25th percentiles of a distribution.

Measuring climate risk in real estate portfolios

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Many assets investors own can only figuratively be underwater when a company becomes insolvent or a stock loses all its value. But for real estate, with long-life fixed assets, there is — literally — a real possibility a building might one day be underwater because of climate change. Given this, investors in real estate may benefit from a better understanding of potential physical and transition risks.

Using the MSCI Real Estate Climate Value-at-Risk (Climate VaR) model we demonstrate how the nature and magnitude of physical risks may differ across assets and portfolios; and highlight the importance of considering transition risk.[1]

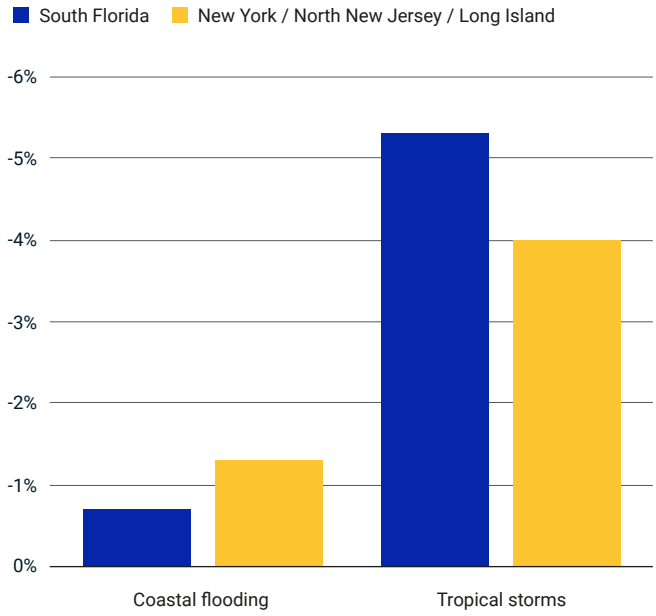
The different types of climate risk

In general, climate risk considerations in real estate can be divided into two categories, physical risk and transition risk (also known as regulatory risk). Physical risks are related to the damage to buildings from extreme weather events caused by climate change. These changing weather patterns could cause both chronic (steady long-term) and acute (severe short-term) effects that can vary depending on geographic location and could increase the costs faced by investors. Transition risks could arise from efforts to address climate change and the transition to a low-carbon economy. They are based on the carbon intensity of the assets and estimate the potential costs of meeting carbon-reduction targets.

Both physical and transition risk can be assessed under different scenarios. When combined they can provide an estimate of how much of the capital value in a real estate portfolio may be at risk due to climate change. However, investors may still need to drill down into the specific hazard exposures and how financially significant any associated costs could be to fully understand the investment implications of climate risk.

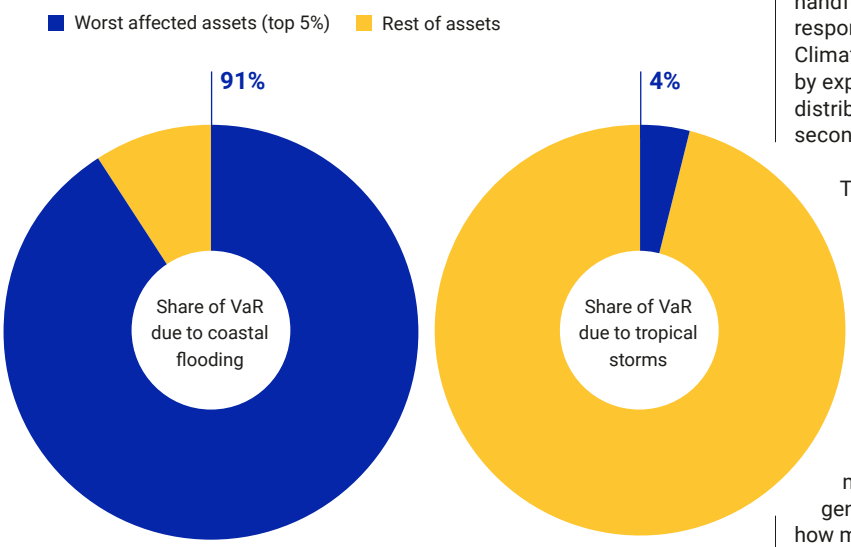
- As a long-term asset class with fixed asset locations, private real estate may be especially vulnerable to both physical and transition risks from climate change.
- Real estate portfolios may be exposed to a variety of physical risks that could impact values. Our analysis found that different potential risks may require different mitigation strategies.
- As the world moves towards a low-carbon economy, transition risk may also play an increasingly important role with investors facing potential costs from emission-reduction requirements.

Exhibit 9: The magnitude and relative importance of physical risks can differ



Source: MSCI Real Estate Climate Value-at-Risk model run on a sample of assets from the MSCI U.S. Annual Property Index. Index data as of December 2019 and model run as of July 3, 2020.

Exhibit 10: Physical climate risks may not be evenly spread across all assets



Source: MSCI Real Estate Climate Value-at-Risk model run on a sample of assets from the MSCI U.S. Annual Property Index. Index data as at December 2019 and model run as of July 3, 2020.

Not all physical risks are the same

We used the MSCI Real Estate Climate VaR model and a sample of 671 assets from the MSCI U.S. Annual Property Index to evaluate two particularly impactful physical risks: Coastal flooding and tropical storms (Exhibit 9). All the assets sampled were from either the New York City, North New Jersey, Long Island (NY, NNJ, LI) metropolitan area or the Miami-Fort Lauderdale-Pompano Beach (South Florida) metropolitan area. Each were run under the model's default assumptions.

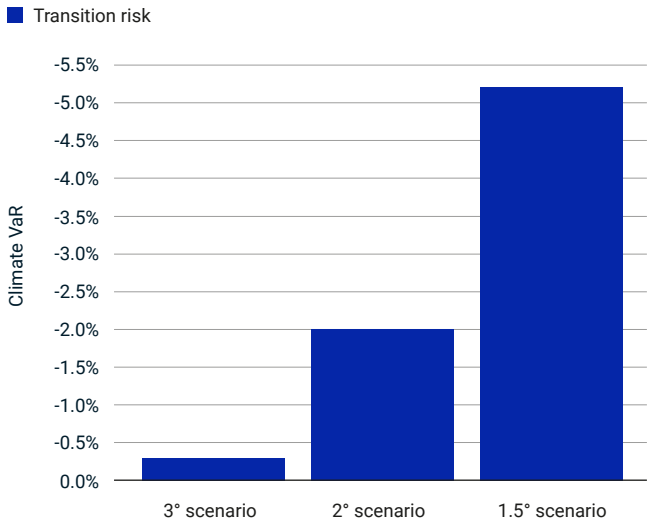
The results suggested that, for this sample of institutionally owned assets, the total Climate VaR due to coastal flooding was lower than for tropical storms in both regions. However, there was some difference in the relative size of these two types of physical risks. In this sample, the Climate VaR from coastal flooding was lower in South Florida than in NY, NNJ, LI (-0.7% vs. -1.3%), but the Climate VaR from tropical storm exposure was higher (-5.3% vs. -4.0%).

The nature and magnitude of physical risks may differ across assets and portfolios

Another distinction was how the different physical risks were distributed across the asset sample. For coastal flooding, we observed that only a handful of assets with the highest exposure were responsible for nearly all (91%) of the estimated Climate VaR. By contrast, the Climate VaR caused by exposure to tropical storms was more evenly distributed across the sample, as illustrated in the second chart (Exhibit 10).

This is unsurprising given that there can be considerable variation in the elevation of individual assets even within a relatively small geographic area, and this can largely drive how much coastal flooding risk they are exposed to. The relatively small number of assets that are exposed, however, typically suffer significant damage, leading to a more substantial contribution to total portfolio risk. By contrast, tropical storms affect broader areas more uniformly, so the potential damage is generally more evenly distributed. This illustrates how mitigation strategies may vary by risk type. For instance, careful asset selection may be a way to minimize coastal flooding risk, but market allocation strategies may help as a way to address risk from tropical storm exposure.

Exhibit 11: Transition VaR for the asset sample (NY / NNJ / LI / South Florida) under different scenarios



Source: MSCI Real Estate Climate Value-at-Risk model run on a sample of assets from the MSCI U.S. Annual Property Index. Index data as at December 2019 and model run as of July 3, 2020.

There can be considerable variation in the elevation of individual assets even within a small geographic area

Transition risk may also be a consideration

While there may be a temptation to focus on physical risks for real assets, transition risk may play an increasingly important role as well. As the world moves towards a low-carbon economy, there are several potential emissions pathways available, with the required emissions reduction for each pathway being inversely proportional to the amount of warming. For example, limiting warming to 1.5 degrees Celsius would require more drastic cuts than a 2 degrees Celsius scenario which would in turn require more cuts than a 3 degrees Celsius scenario.

To illustrate how transition risks may vary, we used the same sample of assets to estimate transition VaR under different scenarios. As we expected, the more aggressive reduction requirements under a 1.5 degrees Celsius scenario resulted in the highest VaR at 4.0%, but even under a 2 degrees Celsius scenario, up to 1.4% of the value in these assets was estimated to be at risk from transition costs, according to our model (Exhibit 11).

Irrespective of what pathway is taken, assets and portfolios with higher carbon intensity could face greater reduction requirements over the coming decades, potentially translating into higher transition costs. When those costs are compared to an asset's value per square meter, it becomes clear that some assets may also be better positioned to absorb those costs.

Given real estate's long-term nature and fixed locations, the asset class may be particularly vulnerable to climate change. By evaluating their real estate portfolios in terms of different physical risks as well as under different transition-risk scenarios, investors may be able to build a more complete picture of their exposure.

[1] The MSCI Real Estate Climate VaR model provides a framework for investors (investment managers, asset owners, banks and insurers) to improve portfolio performance, risk management, regulatory reporting and progress towards broader sustainability goals. Developed by MSCI's Climate Risk Center in Zurich, the framework is closely aligned to the G20's Financial Stability Board's Taskforce on Climate-Related Disclosures (TCFD).

[2] More information on the model can be found in the MSCI Real Estate Climate Value-at-Risk (Climate VaR) Methodology document.

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