

Global real estate: true diversification amidst looming inflation

By Mike Bessell, Dr. Nicholas Buss and Dr. Katherine Seamans

We discuss various aspects of integrating global real estate into an investment portfolio and lay out the case for investors to consider a truly global approach. The article focuses on correlations with other asset classes, such as equities and bonds, and analyzes the inflation protection real estate may offer. Possible remedies to the illiquid nature of direct real estate investments are also developed and an overview presented of how real estate investments are categorized at Invesco Real Estate so as to benefit from structural demand drivers.



All too often, real estate investors concentrate exposures in their home geographies, ignoring diversification benefits from a broader geographic and sector mix.

At global level, real estate offers considerable diversification against the traditional asset classes of equities and bonds (figure 1). Measured in local currencies, we see returns from both direct real estate and listed real estate assets (REITs) with a negative correlation to both bonds and the wider equity market. Even when returns are rebased into US dollars, direct real estate can deliver a strong diversification benefit versus other asset classes.

Also of note – and counter to many general market perceptions – is the slightly negative correlation between REITs and direct real estate. This highlights the need to examine these asset classes in detail, rather than generalizing them all as ‘alternatives’.

The diversification benefit of including direct and listed real estate in a portfolio is also evident on a regional basis. However, in Europe and Asia-Pacific in particular, some of the diversification benefits erode (figure 2), emphasizing a key failing of many asset allocation strategies that limit alternative investments to local assets.

Conclusion 1: To make the most of real estate’s diversification benefits, investors should allocate to multiple regional real estate markets and invest in both direct real estate and REITs.

Inflation protection

Global monetary stimulus in reaction to pandemic-driven supply disruptions and post-lockdown demand have brought inflation back into focus. The result has been increased volatility, particularly in bond markets.

Direct and listed real estate have been mildly positively correlated to inflation, in contrast to the typically negative correlation seen in equities or bonds since 2010 (figure 3). The table shows the relationship over the past decade, when inflation was relatively subdued and trending lower globally. If the post-COVID economic recovery (with the possible short-term exception of the US) is similar to the post-GFC (global financial crisis) recovery, with steady economic growth while countries eventually seek to rein in the recent fiscal expansion, the table provides a useful guide to the expected performance of real estate going forward.

Importantly, the data also supports real estate’s stronger negative correlation in periods with higher inflation (see box: US real estate and inflation).

Conclusion 2: Historically, real estate is shown to offer some protection against rising inflation.

Correlations over time

We next examine how correlations between different global asset classes change when measured over different time periods (figure 4). We start with correlations over



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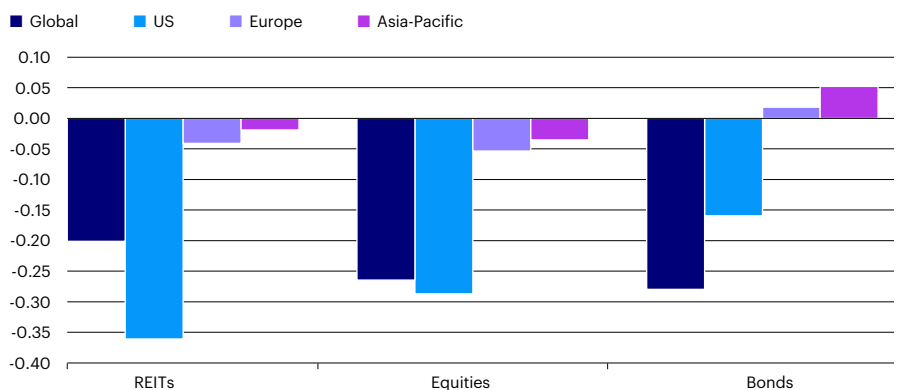
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Figure 1
Correlation of global asset classes

	Direct real estate	REITs	Equities	Bonds
Direct real estate	1.00	-0.20	-0.26	-0.28
REITs		1.00	-0.04	-0.04
Equities			1.00	0.14
Bonds				1.00

All assets in local currency, Q3/2009 to Q1/2021 (the maximum period for which consistent data is available across all asset classes). The asset class indexes are listed in footnote 1 at the end of the article.
Source: Invesco Real Estate based on data from Macrobond as of September 2021.

Figure 2
Correlations of direct real estate with other asset classes in different regions



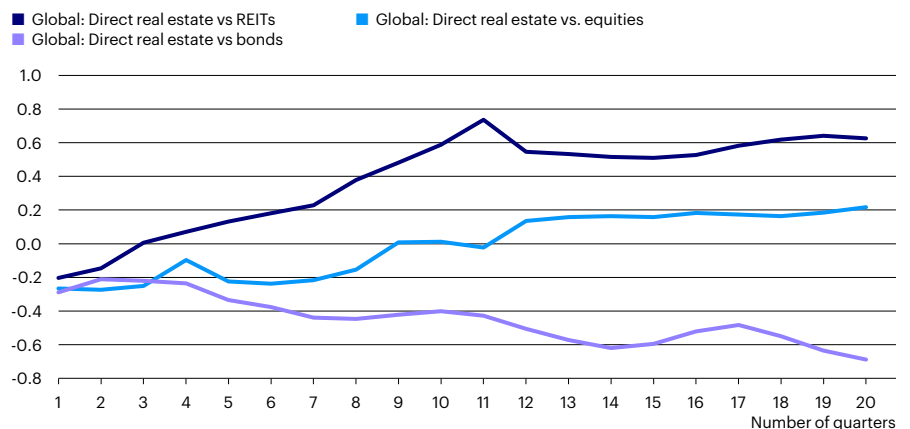
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Source: Invesco Real Estate based on data from Macrobond as of September 2021.

Figure 3
Correlation of direct and listed real estate with inflation

	Inflation	Global	US	Europe	Asia-Pacific
Direct real estate	Global	0.05	0.01	0.18	0.28
	US	-0.00	-0.04	0.19	0.26
	Europe	0.25	0.00	0.08	0.09
	Asia-Pacific	0.22	0.27	0.19	0.26
REITs	Global	0.06	0.28	0.23	0.38
	US	-0.08	-0.03	0.04	-0.19
	Europe	0.08	0.41	0.21	0.51
	Asia-Pacific	0.04	0.23	0.13	0.25
Equities	Global	-0.10	-0.00	0.03	-0.14
	US	-0.09	0.03	0.00	-0.11
	Europe	-0.11	-0.06	0.16	-0.16
	Asia-Pacific	-0.14	-0.03	0.02	-0.12
Bonds	Global	-0.10	0.06	-0.23	-0.10
	US	-0.19	-0.26	-0.28	-0.20
	Europe	-0.26	-0.25	-0.32	-0.25
	Asia-Pacific	-0.10	-0.07	-0.18	-0.06

All assets in local currency, Q3/2009 to Q1/2021 (the maximum period for which consistent data is available across all asset classes). The asset class indexes are listed in footnote 1 at the end of the article. Source: Invesco Real Estate using data from MSCI, Macrobond and Barclays as of September 2021.

Figure 4
Correlations over different time horizons



All assets in local currency, Q3/2009 to Q1/2021 (the maximum period for which consistent data is available across all asset classes). The asset class indexes are listed in footnote 1 at the end of the article. Source: Invesco Real Estate using data from MSCI, Macrobond and Barclays as of September 2021.

a single quarter and increase the time period progressively to five years (20 quarters).

We see that the correlation between direct real estate and all other asset classes is low over the short term, i.e., less than four quarters. However, the correlation between direct real estate and REITs increases over longer time periods, which is no surprise given their similar fundamental exposures. Meanwhile, the correlation between direct real estate and bonds starts negative and decreases further over longer periods, emphasizing the importance of long-term allocation strategies to ensure an appropriate weighting of real estate.

Conclusion 3: The diversification benefits of real estate vs. bonds increase over time.

Liquidity considerations

Since it offers good diversification relative to stocks and bonds, direct real estate can be valuable for most portfolios. But liquidity considerations need to be taken into account. Even real estate fund shares cannot always be sold quickly. Arguably, it is largely the longer time horizon of almost all direct real estate investments that drives the performance difference versus listed asset classes.

Listed real estate offers a long-term return profile similar to direct real estate, but with the benefit of more immediate liquidity and at the cost of greater volatility. Both REITs and direct real estate funds own physical real estate assets. As such, we regularly see listed entities selling assets to direct market funds, and vice versa. In the short run, however, listed and direct real



Conclusion 3: The diversification benefits of real estate vs. bonds increase over time.



Conclusion 4: Adding an exposure to REITs to a direct real estate portfolio can help address liquidity issues while maintaining the allocation to real estate.

estate represent very different types of investment and a different investor mix with different objectives and time horizons leads to very different profiles.

While larger investors may have the relative luxury of maintaining significant holdings in an illiquid asset class like direct real estate, providing an income-generating bedrock that requires only occasional allocation adjustments, a solution for many other investors could be to invest in a vehicle combining elements of both listed and direct real estate. Such a strategy could comprise a diversified mix, e.g., 70-75% direct property with a 25-30% liquidity sleeve that retains an underlying real estate exposure.

Conclusion 4: Adding an exposure to REITs to a direct real estate portfolio can help address liquidity issues while maintaining the allocation to real estate.

Exposures to different drivers

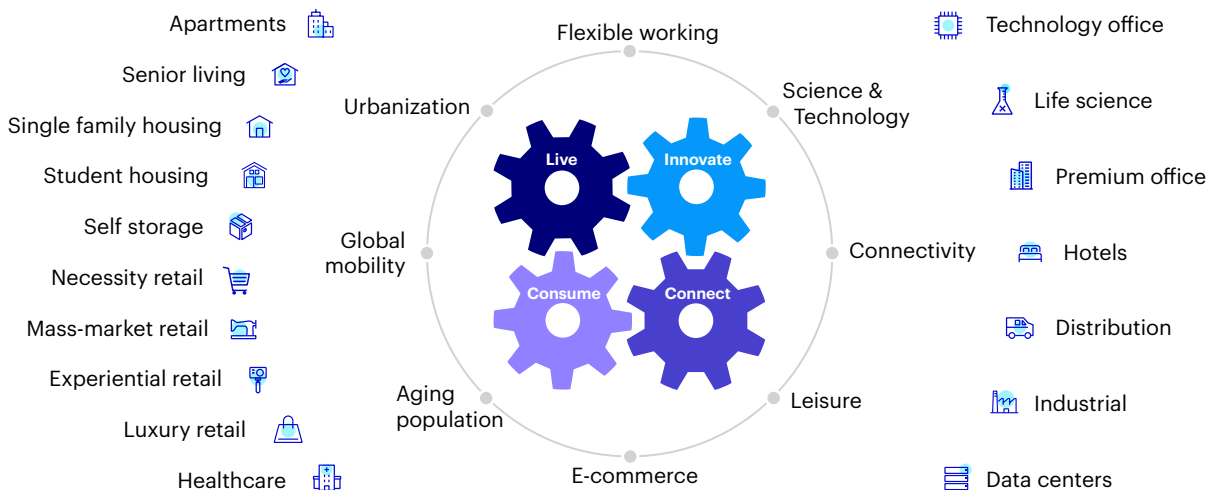
One key reason for the diversification benefits of real estate is that people need real estate for many different reasons. It may sound trite, but real estate houses the economy. As an asset class, real estate is always relevant – always and everywhere. Long lead times to development serve to limit new supply. This is often compounded by stringent planning regulations which seek to reflect multiple conflicting interests, even more so in locations where land is a scarce asset.

Traditionally, real estate is categorized as office, retail, industrial and residential – because that is how global data is gathered and reported. At Invesco Real Estate, we prefer to focus on the underlying influences driving the demand for real estate assets, and hence their performance.

Real estate returns are driven by human needs. How these combine with the influence of various global structural trends and economic cycles determines current and future demand for real estate. Fundamental requirements include the need for spaces to consume, live, innovate and connect (the ‘CLIC’ chart in figure 5).

- Where we consume includes sectors impacted by how and where we spend our money. This means traditional sectors such as retail and logistics (driven increasingly by e-commerce), as well as smaller sectors like healthcare (driven by aging demographics and limited public health provision in some counties) and self-storage facilities (driven by life’s disruptions, such as moving).
- Where we live includes sectors with beds, such as rental housing, seniors housing and student housing. Demographics are the key driver here, as are shifts in locational patterns as we may see created by more flexible work environments in a post-COVID world.
- Where we innovate includes sectors where collaborative working and innovation occur, and where creative and technology-driven industries want to locate. This includes office space oriented to these types of tenants as well as specific types of space to service the rapidly growing life-science sector.
- Where we connect includes the data center sector – another fast-emerging sector that is now the critical backbone of corporate infrastructure as we continue to generate exponential amounts of data. This needs to be safely stored and readily accessed to connect us all together, as we have all learned since the start of the global COVID-19 pandemic.

Figure 5
The CLIC* framework
Opportunity: secular trends guide our thinking



* CLIC = Consume/Live/Innovate/Connect
Source: Invesco as of August 2021.



Conclusion 5: In order to capture the underlying drivers, we regard the consume/live/innovate/connect framework superior to the office/retail/industrial/residential classification.

All these activities are part and parcel of daily life around the globe, and all require real estate. The CLIC themes are constant in that they are the same today as they were hundreds of years ago. What changes is ‘how’ we consume, live, innovate and connect. Understanding the secular trends that influence the ‘how’ allows us to invest in the most relevant real estate worldwide today.

Conclusion 5: In order to capture the underlying drivers, we regard the consume/live/innovate/connect framework superior to the office/retail/industrial/residential classification.

Summary

The diversification benefits of alternative investments such as real estate within larger portfolios is reasonably well understood. However, to maximize the diversification benefits, we believe that asset allocators should examine the details of how this exposure is structured.

Direct and listed real estate assets offer both long-term risk diversification for large portfolios and the potential for significant inflation protection. These factors are expected to drive ongoing interest in real estate as an asset class as the global outlook normalizes after the COVID-19 pandemic, and beyond.

US real estate and inflation

Due to the substantial monetary support in response to COVID-19, financial markets remain focused on the global inflation outlook. With the highest levels of money supply growth, the US is at the center of these concerns, leading to questions regarding the impact on real estate.

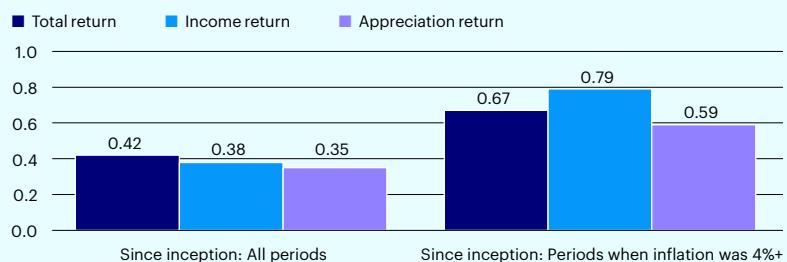
We find that US real estate is well placed to withstand any changes to the inflationary or interest rate environment. The relative pricing of real estate in 2021 appears favorable; with the spread between NCREIF Property Index current value cap rates and 10-year US Treasury averaging 247 basis points in Q2-2021 – above the long-term average of 244 bps.

There is clear room for movement. Based on the Q2-2021 cap rate spread, as well as the long-term average spread and an 87 bp standard deviation of the long-term spread, US Treasury yields could rise as much as 90 bps before the cap rate spread shrinks below the normal long-term range.

In addition, while real estate overall is positively correlated to inflation, as seen above, this correlation is actually strongest when inflation is high (figure 6). As such, we believe investors concerned about the sustainability of above-trend inflation in the US should consider increasing real estate allocations.

Furthermore, we find that all traditional real estate sectors, with the exception of retail, have served as effective hedges against high inflation, emphasizing the benefit of a diversified real estate strategy within a broader allocation (figure 7).

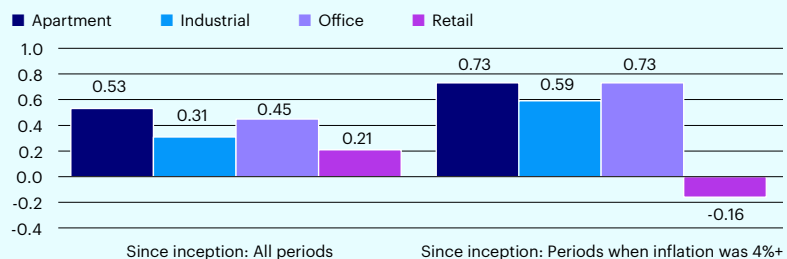
Figure 6
Correlation between inflation and real estate return components, Q1-1978 to Q4-2020



Since-inception returns for NPI (NCREIF Property Index) are from Q1-1978 to Q4-2020. It is not possible to directly invest in an index. Past performance is not indicative of future results.

Source: Invesco Real Estate using data from NCREIF and Moody’s Analytics as of March 2021.

Figure 7
Correlation between inflation and real estate sector total returns, Q1-1978 to Q4-2020



Since-inception returns for NPI (NCREIF Property Index) are from 1Q-1978 to 4Q-2020. It is not possible to directly invest in an index. Past performance is not indicative of future results.

Source: Invesco Real Estate using data from NCREIF and Moody’s Analytics as of March 2021.

Note

1 Asset class indices (maximum time period, at least since 1/1/2000, unless unavailable):

		Index	Source provider	Start date
Global	Direct real estate	MSCI Global Property Fund Index - Natural Weights Benchmark Returns	MSCI	Mar-08
Global	REITs	FTSE EPRA/NAREIT, Gross Total Return	Macrobond	Jun-09
Global	Equities	MSCI, Mid & Large Cap, Index, Total Return	Macrobond	Jun-01
Global	Bonds	Bloomberg-Barclays Aggregate Bond Index	Barclays	Jan-00
US	Direct real estate	MSCI U.S. Quarterly Property Index (Unfrozen) published Quarterly	MSCI	Jan-00
US	REITs	FTSE/NAREIT All Equity REITs Total Return	NAREIT	Jan-00
US	Equities	S&P, 500, Index, Total Return	Macrobond	Jan-00
US	Bonds	Bloomberg-Barclays Aggregate Bond Index	Barclays	Jan-00
Europe	Direct real estate	MSCI Pan-European Quarterly Property Fund Index (Unfrozen) published quarterly	MSCI	Mar-04
Europe	REITs	FTSE EPRA/NAREIT, Gross Total Return, Close, DEVELOPED EUROPE CAPPED	Macrobond	Dec-07
Europe	Equities	MSCI, Mid & Large Cap, Index, Total Return	Macrobond	Jun-01
Europe	Bonds	Bloomberg-Barclays Aggregate Bond Index	Barclays	Jan-00
AsiaPac	Direct real estate	MSCI Global Property Fund Index - APAC-Natural Weights Benchmark Returns	MSCI	Mar-08
AsiaPac	REITs	FTSE EPRA/NAREIT, Gross Total Return	Macrobond	Sep-09
AsiaPac	Equities	MSCI, Mid & Large Cap, Index, Total Return	Macrobond	Jun-01
AsiaPac	Bonds	Bloomberg-Barclays Aggregate Bond Index	Barclays	Dec-00

Further reading**Real estate: A real solution?***

Asset allocators are faced with a variety of challenging macroeconomic forces and competing investment goals. At Invesco Investment Solutions (IIS), we utilize both listed and direct real estate in our portfolios due to their versatile characteristics and attractive return profiles. This allows us to design specific allocations for common thematic objectives, namely: real return, growth and income.

Investors focusing on real return aim for stable cash generation in various inflation and interest rate environments. This requires a level of diversification not present in traditional assets. As real estate can pass through rising prices in the form of rent increases, exposure to this asset class may be attractive for investors seeking to preserve their assets on a real basis.

Investors focusing on growth look to expand their asset base with above-average price appreciation. Utilizing our proprietary capital market assumptions, we posit that stocks and bonds may not provide enough total return to reach common investor return objectives. Real estate in its various forms, on the other hand, is expected to outperform these assets on an absolute and risk-adjusted basis.

Investors focusing on income may benefit from real estate capitalization rates that provide an attractive spread over government bonds as well as medium-grade corporates.** Compared to high yield, private real estate debt also provides a spread, tends to be longer dated and maintains its correlations to the real underlying asset due to collateralization in case of default.

Real estate is an important asset class for investors across the risk spectrum. Few assets other than real estate can fit into as wide a selection of investment objectives, and we continue to view it as a critical piece of any broad asset allocation strategy.

* Based on Drew Thornton, 3Q21 Capital Market Assumptions Whitepaper, Invesco Investment Solutions.

**Source: Invesco Investment Solutions, NCREIF, US Board of Governors of the Federal Reserve System, Moody's Analytics, as of March 31, 2021.



“Adding global real estate to a portfolio has clear benefits.”

Interview with Mike Bessell, Dr. Nicholas Buss, and Dr. Katherine Seamans

Risk & Reward spoke to Mike Bessell, Dr. Nicholas Buss and Dr. Katherine Seamans about their views on the top-of-mind issues affecting today’s real estate market, including portfolio diversification, inflation, ESG and what a post-COVID landscape might look like.

Risk & Reward

We are talking about the diversification benefits of private assets today. How should asset allocators be thinking about the role of an asset class like real estate within a wider portfolio?

Mike Bessell

I guess we would say this being real estate investors, but there are clear benefits to holding real estate in most wider investment portfolios, both in terms of the diversification of real estate against other assets, but also in terms of the significant contribution that income makes to real estate’s total return. But more importantly, in thinking about the role that real estate plays, asset allocators should consider looking beyond just real estate as a single ‘amorphous’ asset class. No one looks at their equity allocation and just holds one stock, and in the same way a real estate portfolio should, in our view, be appropriately structured in a similar fashion.

Nick Buss

I think that there is an important benefit derived from adding global real estate to a portfolio in that different markets and/or geographies see limited correlations in performance. Real estate is a derived demand based on the economic drivers of a local economy. As we know, economic cycles are not always correlated across the globe and pace of growth can vary widely. As a result, investing across markets can provide additional diversification and risk mitigation within the asset class.

Katie Seamans

In addition to geographical diversification of real estate investments, different real estate sectors offer additional diversification benefits for a portfolio. The demand for different sectors is driven by the real estate needs of the local population; most of us

need a place to live, do our shopping and go to work. Real estate literally and figuratively houses our economy.

Risk & Reward

So how is IRE supporting clients looking to benefit from global diversification?

Mike Bessell

As a manager with experience across equity/debt markets, listed/direct and global/local real estate, creating a one-stop-shop for global diversification of the real estate asset class is important to us.

At the heart of our business is core real estate with its high-quality, long-income focus. I believe we are relatively uniquely positioned amongst our peers in having sufficiently sized core assets in each of the three regions – Asia Pacific, EMEA and North America.

Understanding the markets’ needs is crucial: some are looking for pure direct real estate exposure, while others want to overlay a liquidity sleeve in the form of listed real estate securities. And this is particularly important for those who need to have daily liquidity.

We are seeing how investing in both global direct and securities is appealing today, especially where, historically, access and exposure to the domestic markets have been the trend.

Risk & Reward

Inflation is a hot topic at present, given the combination of post-pandemic supply chain pressures and the strong growth in money supply in key markets. How does real estate perform in an inflationary environment?

Nick Buss

In the US, real estate has historically been a decent hedge against rising inflation. The US experience is that correlations between real estate performance and inflation have strengthened during periods of higher inflation. When you look at the data, the correlation over the long term (the last 40 years) has been 0.42. But when inflation has moved above 4%, the correlation has strengthened to 0.67.¹ We have seen differences across property types, with



Asset allocators should consider looking beyond just real estate as a single “amorphous” asset class.



Demand for real estate is driven by human activities and the need for physical accommodation.

stronger correlations for apartment, office and industrial properties and weaker for retail. This differentiation typically results from the ability and swiftness of a sector to increase rents, which in turn depends on underlying lease terms and structures. For example, the apartment sector, which is typically characterized by one-year leases, has the highest correlation as landlords can quickly reset rents in an inflationary period.

Katie Seamans

That said, from a global perspective it is actually less clear how real estate performs in an inflationary market. Part of the reason for this is the fact that real estate markets outside of the US are influenced by a stronger proportion of global capital flows relative to domestic investors. This breaks some of the connection to local influences, such as CPI.

Also, in some markets such as Europe and Australia, step-up rents – pre-arranged increases on agreed-to dates – are linked to inflation. In these markets, there is growth potential but not likely growth beyond inflation. Inflationary pressures can even vary by market and by sector. For example, industrial rents may benefit from rising inflation in markets with an undersupply of last-mile distribution facilities and as e-commerce penetration increases. Retail for non-discretionary goods (say, groceries) may benefit in an inflationary period, but those for luxury or discretionary goods may feel a squeeze from supply chain disruptions and, again, increasing shifts to e-commerce.

Risk & Reward

Could you provide more insight regarding why the correlations between asset classes change over time?

Mike Bessell

Over the longer term, the performance trends of direct and listed real estate have actually been very similar. Listed real estate, such as the FTSE EPRA NAREIT Global Index, has tracked a more volatile path around the smoother returns of the direct market, such as the MSCI Global Property Fund Index. In the short term, equity market noise can affect these returns but, longer term, both show the same fundamental growth profile.

Similarly, over the longer term, economic growth drives both equities and real estate markets, so it is to be expected that these will show an increasing correlation over time once the effects of the shorter-term equity market volatility dissipate from the returns.

Risk & Reward

You talk about real estate investors as longer-term holders. Can we explore the reasons for that a little more?

Mike Bessell

The acquisition of a physical real estate asset requires specialist input, which takes time and adds cost. Brokerage fees, legal

documentation and due diligence typically cost 1% - 2% of an asset's value. In addition, real estate transfer taxes may be due on a change of ownership, except where the asset can be sold within a corporate entity. While transfer taxes vary by country, these can be significant – around 5% of the purchase price in England and France, between 3.5% and 6.5% in Germany – while charges in the US vary by municipality and in the customary split between buyer and vendor. Due to these high costs in acquiring and liquidating real estate assets, it makes sense to hold the investment for longer than listed assets, which is exactly what we see in our market.

Risk & Reward

You have an interesting framework for looking at the role real estate assets play. Could you provide a little more color on the thinking behind this?

Katie Seamans

Demand for real estate is driven by human activities and the need for physical accommodation. We need locations to Consume, Live, Innovate, and Connect. It all just CLIC'd for us one day – we are actually investing in our own daily lives! As a population's needs change, the drivers of real estate demand change, and we adjust our allocations accordingly to align with the most relevant real estate for the market.

Nick Buss

Yes, this CLIC framework forms the basis of how we really view the market and is centered around global structural drivers, particularly demographics, technology disruption and lifestyle shifts. But these will all play out differently in different regions and markets across the globe depending on local structures and culture.

Let me walk you through some good examples. Firstly, shifts in demographics are expected to impact changing demand for housing. For instance, the aging of the large Millennial generation into their mid-30s/early 40s, entering the 'family' stage of their lifecycle, where they are looking for more space and factors such as school quality become more important. This may move demand from urban rental housing toward suburban single-family housing for that demographic. Meanwhile, the aging trend and the rise of seniors across the globe in my view will be impactful over the next two decades. Most directly, this has implications for housing choice and healthcare but will play out differently across the globe depending on social welfare structures and public health provisions.

A second example is how technology disruption is broadening. We are clearly seeing this today in the ongoing growth of e-commerce (driving logistics demand, negatively impacting the need for physical retail space), but we also see this driving demand for sectors such as life science and data centers. Meanwhile, shifts in lifestyle and working patterns continue



The pandemic has accentuated and accelerated structural shifts, favoring sectors such as logistics, residential, and life science.

to play out, and in some cases have been accentuated by the impact of the COVID pandemic. For instance, the shift to a more hybrid/work-from-home model may be less in some regions (Asia, Europe) than others (North America) due to the size of residences and cultural factors, such as multigenerational living.

Risk & Reward

ESG is a key topic for real estate. Could you share some details on how Invesco Real Estate is approaching this?

Katie Seamans

Across real estate markets, Environmental, Social and Governance (ESG) credentials are an increasingly important consideration for both real estate investors and occupiers. ESG+R (ESG and Resilience) investing is a fundamental commitment at Invesco Real Estate. Our ESG+R philosophy is based on our belief that ESG aspects can deliver both competitive financial returns and opportunities for business growth and innovation. To support this, we have set global targets of a 3% annual reduction in energy and emissions by 2030 from a 2018 baseline, net zero carbon emissions by 2050, and 1% annual reduction in water consumption and 1% annual increase in waste diversion.

Mike Bessell

We also place a lot of emphasis on the Global Real Estate Sustainability (GRESB) scoring. These are peer-relative scores that continually increase the standards required.

We are very pleased that the latest results show that 83% of the 60% of our AUM submitted to GRESB earned a 4- or 5-star ranking and our scoring improved across our AUM submitted from 2020 to 2021.

Risk & Reward

How do you see the returns outlook for global real estate from here?

Nick Buss

Looking ahead, we expect real estate yields to remain attractive vis-à-vis alternate investment options. In my view, the sector should continue to attract capital based on its income-generating characteristics and diversification benefits it brings to a mixed-asset portfolio. As we look across the globe, we recognize that recovery from COVID is occurring at an uneven pace, and that this is unlikely to change in the near term.

Generally, fiscal and monetary stimulus measures remain supportive, but inflationary pressures are real and may prove more persistent in some regions (although, as we discussed earlier, real estate can provide a hedge to this risk in some regions). Within the sector, we see secular trends remaining the bedrock of real estate demand and this will serve as our guidepost for asset and market selection.

The pandemic has accentuated and accelerated structural shifts, favoring sectors such as logistics, residential and life science. Cyclical uplift may provide tactical opportunities, but we expect greater divergence in asset performance. We feel that caution is warranted not to focus too much on the short-term pent-up demand story that may play out post-COVID. Regionally, with the aim of benefiting from the multispeed recovery, our current view is to maintain an overweight to the US, neutral to Asia Pacific and underweight Europe.

Note

¹ Since Inception returns for NPI (NCREIF Property Index) are from 1Q-1978 to 4Q-2020. You cannot directly invest in an index. Source: Invesco Real Estate using data from NCREIF and Moody's Analytics as of March 2021. Past performance is not indicative of future results.



About the authors



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About risk

The value of investments and any income will fluctuate (this may partly be the result of exchange rate fluctuations) and investors may not get back the full amount invested. There are risks involved with investing in ETFs, including possible loss of money. Index-based ETFs are not actively managed. Actively managed ETFs do not necessarily seek to replicate the performance of a specified index. Both index-based and actively managed ETFs are subject to risks similar to stocks, including those related to short selling and margin maintenance.

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