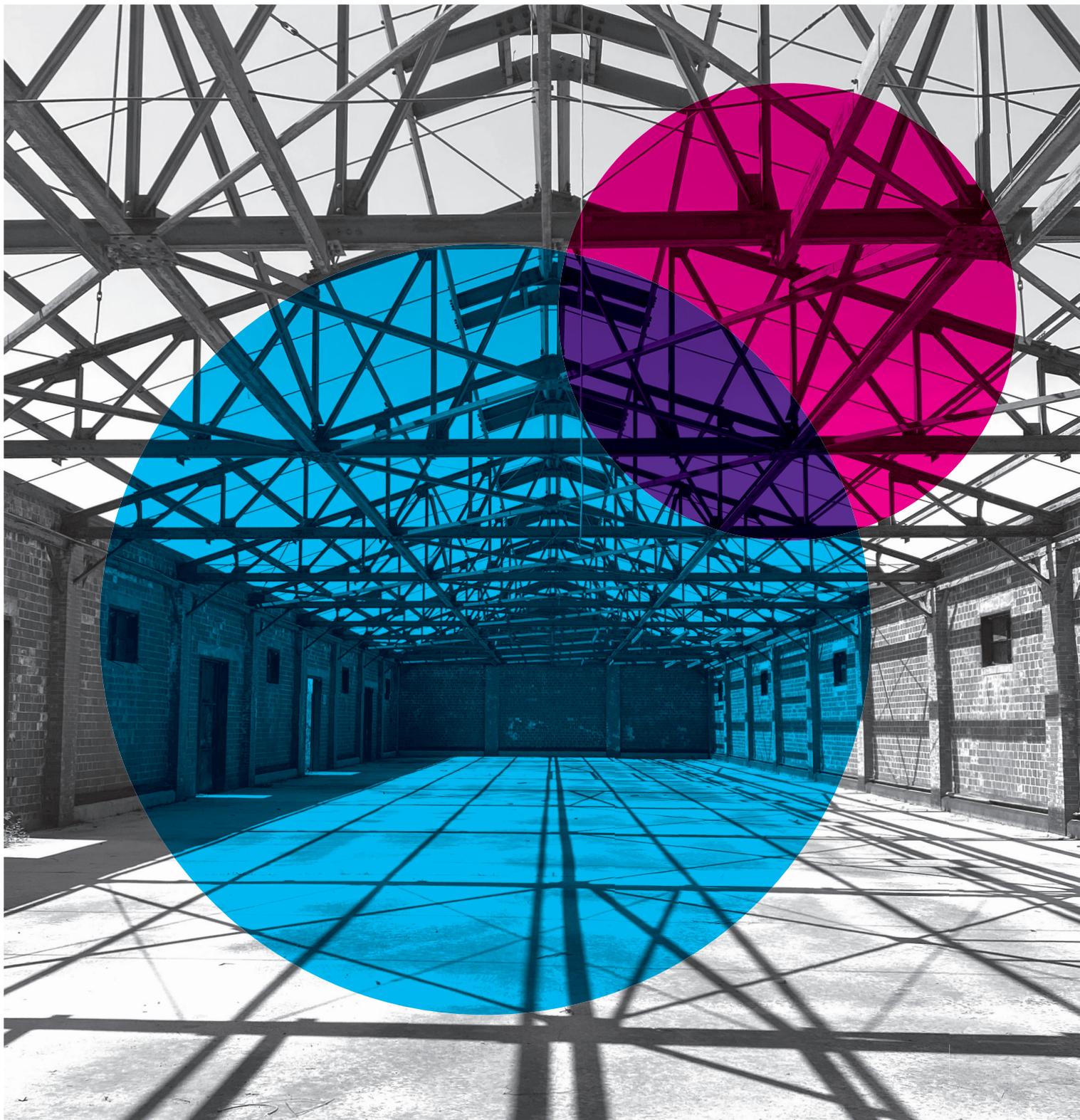


SUMMIT

AFIRE

FALL 2021

08



SUMMIT

AFIRE is the association for international real estate investors focused on commercial property in the United States.

ABOUT

Summit Journal is the official publication of AFIRE, the association for international real estate investors focused on commercial property in the United States.

Established in 1988 as an essential forum for real estate investment thought leadership, AFIRE provides a forum for its senior executive, institutional investor, investment manager, and service provider members to help each other become Better Investors, Better Leaders, and Better Global Citizens through conversations, research, and analysis of real estate capital markets, cross-border issues, policy, economics, technology, and management. AFIRE has nearly 200 member organizations from 24 countries representing approximately US\$3 trillion in assets under management.

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About the cover: A former storage warehouse at a once-massive manufacturing facility outside Chicago, Illinois sits vacant and awaits adaptation.

Photo by Benjamin van Loon.

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CHECKING THE PULSE

No matter your age or experience, 2021 has shaped up to be a year that no one can forget. Findings from the AFIRE 2021 Mid-Year Pulse Survey detail a cautious road ahead.

Gunnar Branson
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AFIRE



NOTE FROM THE EDITOR

REASSESSING CLIMATE RISK

The commercial real estate industry may not yet fully grasp the actual relationship between climate risk and asset pricing and value. But the knowledge is coming fast.

Jim Clayton
York University

Steven Devaney
Jorn Van de Wetering
University of Reading

Sarah Sayce
Kingston University

Matthew Ulterino
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THE ALLURE OF SPECIALTY SECTORS

Real estate investments have historically coalesced around common property types—but it may make sense for investors to reconsider specialty property sectors in the post-COVID world.

David Wertheim
Invesco Real Estate



NON-TRADITIONAL IS GOING MAINSTREAM

The mainstreaming of non-traditional property types is well on its way within institutional investing, which will materially broaden the real estate investment universe.

Indraneel Karlekar, PhD
Principal Real Estate Investors



DIVERSIFYING INTO DIGITAL

As investors look for sustainable sources of inflation-protected yield, real estate investment is increasingly blurring into a wider range of “digital” real asset investment strategies.

Warren Wachsberger
Josh Katzin
Corbett Kruse
AECOM Capital



TAPPING INTO BIOTECH

Life sciences real estate has been a “hot” property type for the past decade—and even more since the pandemic. Will all the capital targeting the space be placed where it needs to go?

William Maher
Ben Maslan
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RCLCO Fund Advisors

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HIGH-WATER MARKS

Interest and excellence in ESG performance is becoming increasingly critical to portfolio strategy. So with sea levels on the rise, how can portfolios stay above water?

Jerry Speltz
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WHY DEBT, WHY NOW?

Debt funds remain a comparatively small part of the real estate investment market, but they have been gaining in prominence in recent years.

Karen Martinus
Mark Fitzgerald, CFA, CAIA
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USAA Real Estate

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VALUING NET-ZERO

With more tenants focusing on environmental targets, the burden to reduce direct emissions places increased pressure on investors, who are at a pivotal moment in ESG strategy.

Lori Mabardi
Emily Chadwick
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MIGRATION IN REAL TIME

As the public health situation started to improve in early 2021 and the economy reopened, did migration flows change too—and what if we are able to answer this in real time?

Michael Clawar
StratoDem Analytics
Gleb Nechayev
Berkshire Residential Investments

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FAMILY OFFICES AND ESG

As sustainable investing continues to grow in popularity, family offices have taken note—and understanding ESG targets and regulations will be key for long-term performance.

Kate Pennartz
Rebekah Singh
Squire Patton Boggs

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DOWNTOWN DISRUPTION

The pandemic-driven changes to downtown areas and central business districts is changing the geography of institutional investment. What else changes because of this?

Bruce Katz
Drexel University

Frances Kern Mennone
FBT Project Finance Advisors
Right2Win Cities

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CHOOSING FLEXIBILITY

Employees are increasingly demanding flexibility and choice for where (and when) they work. What strategies can landlords implement to adapt?

Tal Peri
Union Investment Real Estate

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TALENT PARITY

To be better prepared for future risks, firms need diverse talent. So is the goal of 50% female representation achievable in global real estate investment and asset management firms?

Isabel Ruiz Halter
Sheffield Haworth

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PREDICTING THE CLIMATE FUTURE

We are all invested in the cities, assets, and infrastructure of tomorrow, even if we might not live to see the ten largest cities table in 2100. But understanding climate change can get us closer.

Rajeev Ranade
Owen Woolcock
Climate Core Capital

NOTE FROM THE EDITOR

NOVEMBER 2021

One of the basic truisms of modern social psychology is that the ideas we hold as individuals do not originate from nothing; everything we believe comes from somewhere else.

Some experts suggest that some of the most pervasive ideas—including those we value in personal and professional contexts—come from our immediate communities, whether we're aware of it or not. Today we know this concept better as “groupthink”—a concept originally coined in the 1950's by sociologist and urbanist William Whyte, author of *The Organization Man*, to explain how our shared desire for harmony in a group can often lead us to collectively reach ideological consensus, regardless of its rationality or irrationality.

Groupthink is usually leveraged as a critique of mob mentality on the internet, but that's only because social media allow us to observe the phenomenon in real time. Meanwhile, we like to think of our ideas about business, corporate culture, organization management, and investment philosophy as *sui generis*; not subject to the same irrationality that seems to dominate popular discourse.

But even the real estate industry—one powered by leagues of smart people with innovative ideas—has its own tendencies towards groupthink (especially if the past twelve years of Great Financial Crisis retrospectives have taught us anything). The pandemic has therefore served as a gut check on the established orthodoxies of our business. Conscious investors and owners are taking a deeper look at the emergent and intersectional fundamentals that will generate long-term value as the world gradually emerges from convergent global crises into the “new normal,” whatever that might be.

What we see in this newest issue of Summit Journal is less group think and more group problem solving. The authors here have eschewed standard predictions or calculated optimism about the standard asset classes—office, retail, residential, and industrial—and outlining strategies for movement into alternative sectors. Warren Wachsberger, Josh Katzin, and Corbett Kruse of AECOM Capital (p. 30); Indraneel Karlekar of Principal Real Estate (p. 26); David Wertheim of Invesco Real Estate (p. 20) all explore gateways into specialty sectors, while Jerry Speltz of Barings Real Estate (p. 40); Lori Mabardi, Emily Chadwick, and Eric Enloe of JLL (p. 50); William Maher, Ben Maslan, and Cecilia Galliani of RCLCO (p. 34) explore the specifics of some of these sectors, and what areas investors need to watch.

Additionally, Tal Peri of Union Investment (p. 70) explores new work habits, Isabel Ruiz-Halter of Sheffield Haworth (p. 78) discusses talent parity for business leaders, and the works of Jim Clayton et al. (p. 14); Owen Woolcock and Rajeev Ranade (p. 84); and Frances Mennone and Bruce Katz (p. 64) talk about the larger environmental and social issues that will continue to upend groupthink in the coming years.

Taken together, the ideas discussed in this issue do not represent a new consensus—nor should they. Value is not derived from consensus, but from ingenuity. And as we write in our summation of the AFIRE 2021 Mid-Year Pulse Survey (p. 6), this sort of thinking is undoubtedly warranted during these uncertain times.

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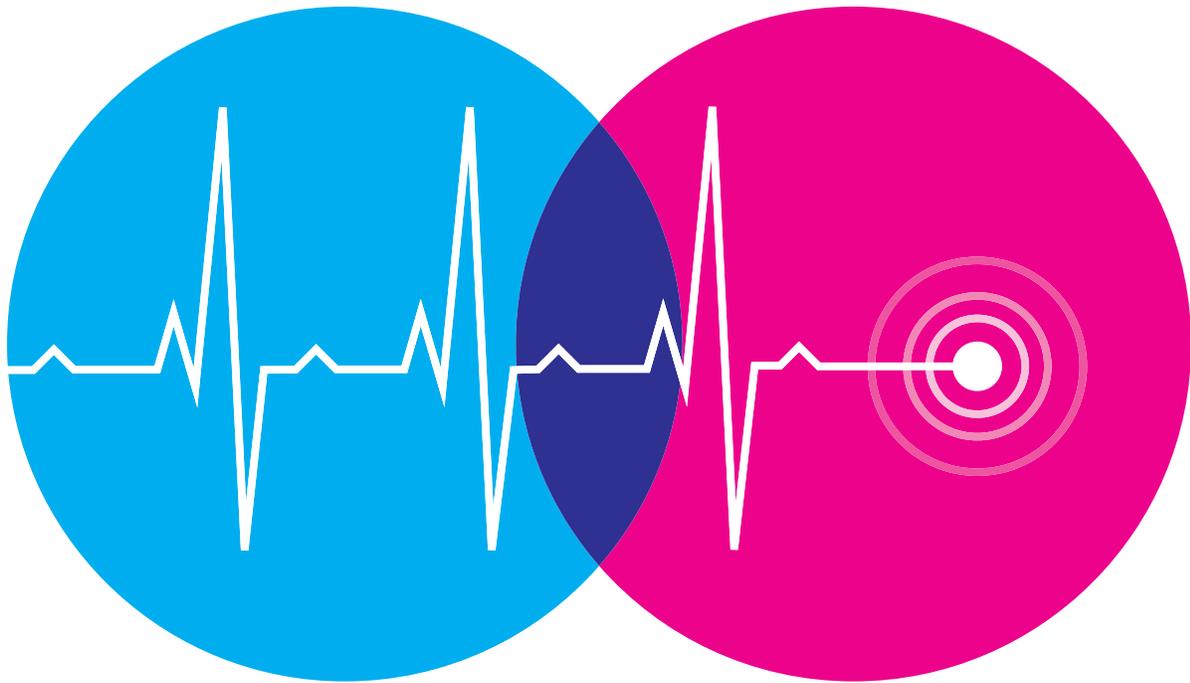
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CHECKING THE PULSE



By Gunnar Branson
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Benjamin van Loon
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No matter your age or experience, 2021 has shaped up to be a year that no one can forget. Findings from the AFIRE 2021 Mid-Year Pulse Survey detail a cautious road ahead.

On one hand, the past year has been guided by a modern miracle, with effective vaccines developed and deployed faster than ever to combat the ongoing pandemic. But this year has also been complicated with new virus variants, uneven vaccination rates, closed borders, and bitter politics.

People continue to adapt in creative ways. When AFIRE members were surveyed in March 2021 for the association's Annual International Investor Survey, they expressed an overall sense of optimism thanks to the adaptations and the hope that the pandemic might soon pass.¹

Historically, AFIRE has only conducted this survey annually—but this year's survey research project was necessarily adapted to meet the needs of the "new normal," thus warranting a mid-year sentiment "pulse" survey, or follow-up to the March questionnaire.²

When this pulse survey was conducted in August 2021, the optimistic outlook explicated in Q1 2021 had evolved, reflecting a greater emphasis on risk aversion and more concern for critical issues across business, real estate fundamentals, and social and political trends.

INVESTOR CONCERNS

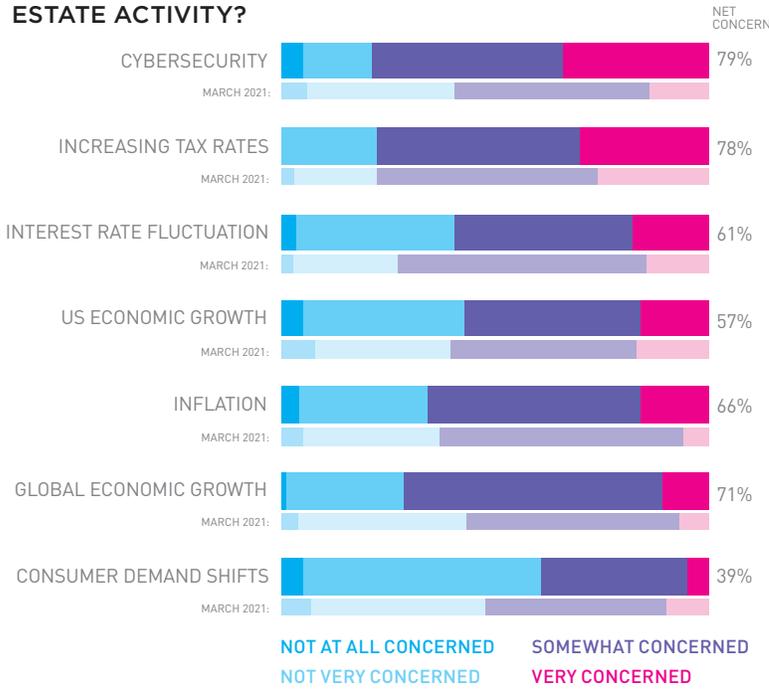
To compare changes in attitudes related to the general business climate, respondents were asked to rate their concern about seven key business factors. In March 2021, increasing tax rates ranked as a top concern (78% net concern), followed by interest rate fluctuation (73%), and inflation (63%).

While concerns about increasing tax rates have not meaningfully changed over the past several months (remaining at 78% net concern), and concerns about inflation have grown slightly (from 63% to 66%), cybersecurity has skyrocketed to the top of the list, ranking at 79% net concern, up from 60% earlier this year.

These concerns are interrelated. For example, concerns about economic conditions (e.g., interest rate fluctuations, inflation, and economic growth) have mostly subsided in recent months, perhaps reflecting the stabilization of pandemic-related uncertainties as the world becomes more organized in its fight against COVID-19.

Similarly, the subsidence of some of these uncertainties (e.g., shifts in consumer demand) has correspondingly heightened concerns in other related areas, especially around cybersecurity, which has become even more integral to consumer confidence through and beyond the pandemic.

EXHIBIT 1: HOW CONCERNED ARE YOU ABOUT THE FOLLOWING FACTORS ON YOUR US REAL ESTATE ACTIVITY?



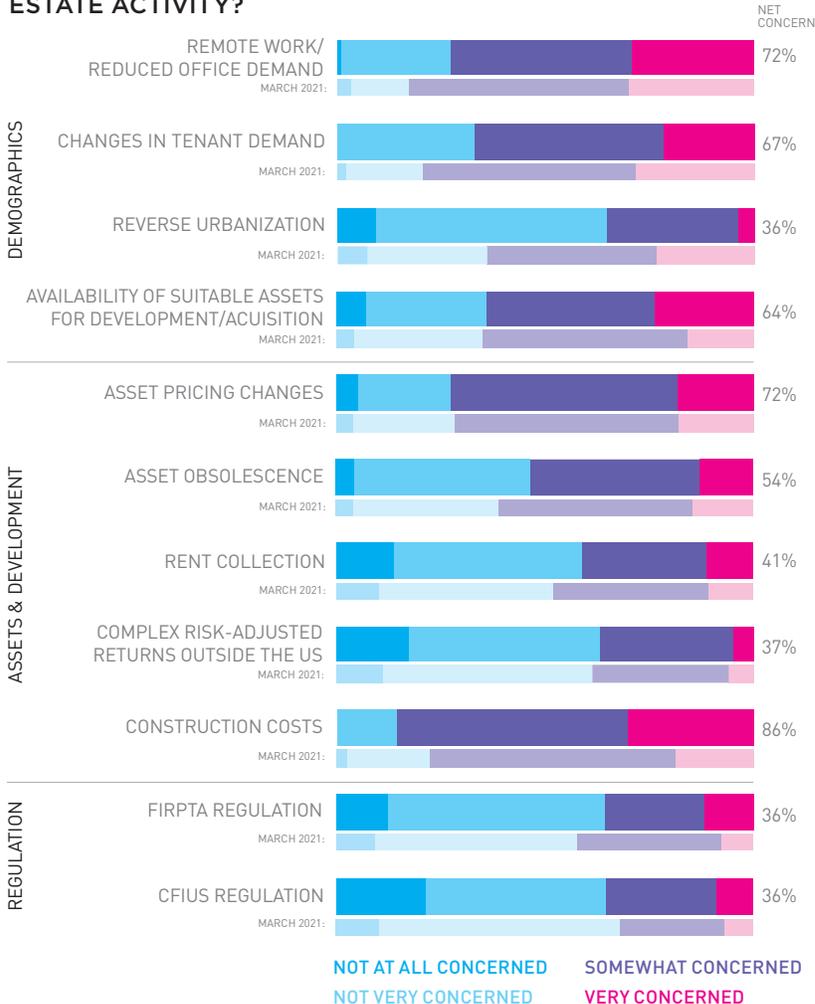
Construction costs have grown to the area of greatest concern (86%). This trend could continue, especially in the face of ongoing supply chain challenges.

Investor concerns about real estate fundamentals across demographics, asset types, and regulation have declined over the past several months.

The most substantial declines have occurred around remote work/office demand (72% net concern, down from 83%) and changes in tenant demand (67%, down from 80%), reflecting market adaptation to prolonged pandemic conditions.

Concerns about migration out of cities has also seen significant decline (36% net concern, down from 53%), while concerns around rent collection, asset pricing, obsolescence, and/or availability have remained notably stable. And even as most concerns have declined or stayed the same, construction costs have grown to the area of greatest concern (86%). This trend could continue, especially in the face of ongoing supply chain challenges.

EXHIBIT 2: HOW CONCERNED ARE YOU ABOUT THE FOLLOWING FACTORS ON YOUR US REAL ESTATE ACTIVITY?



In March 2021, public health issues topped the list of social and political concerns for investors (79% net concern). COVID vaccines were beginning to roll out, and there was some collective optimism that the world was past the worst of the pandemic.

However, the Delta strain upended that optimism by mid-year, and markets battered down for a prolonged pandemic, as reflected by the increase to 91% net concern for pandemics—nearly universal.

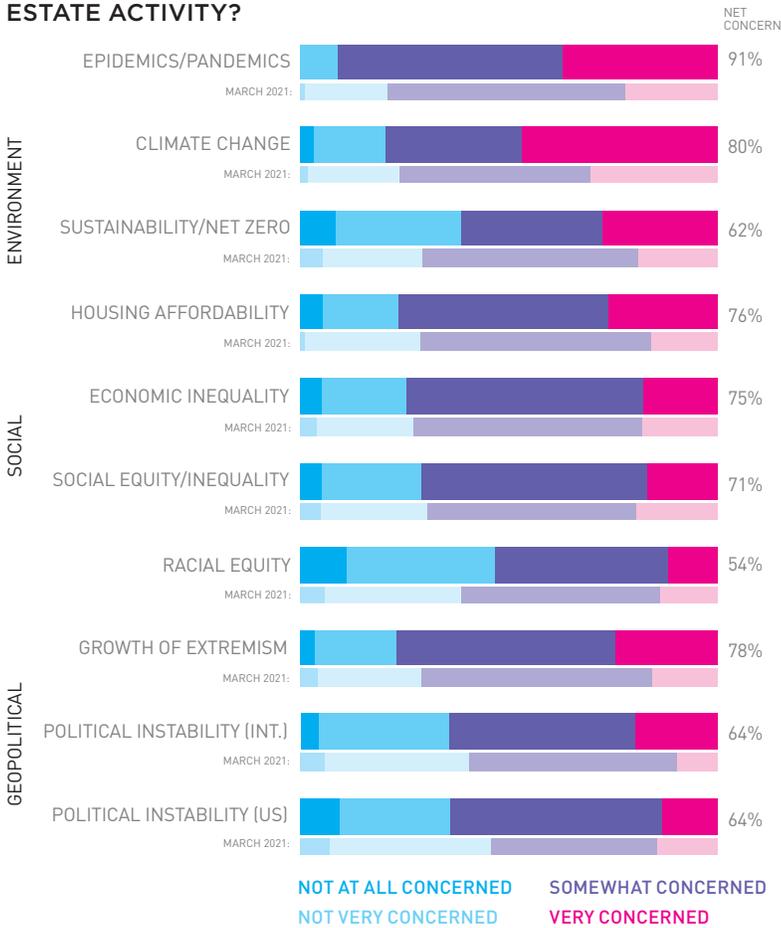
Concerns around climate change, affordable housing, and economic and social inequity also saw slight increases in concern, though concerns about pathways towards progress in these areas (e.g., sustainability and racial equity) saw moderate declines. However, concerns related to political instability and extremism, globally and in the US, have increased over the past several months.

RISK MANAGEMENT

In the face of evolving concerns across business, real estate, and socio-political conditions, risk management has become increasingly critical, especially as our dominant areas of risk—including those related to political, social, climate, and technological concerns—also threaten to be novel in their manifestation (e.g., large-scale climate events, malicious ransomware, disease strains, etc.)

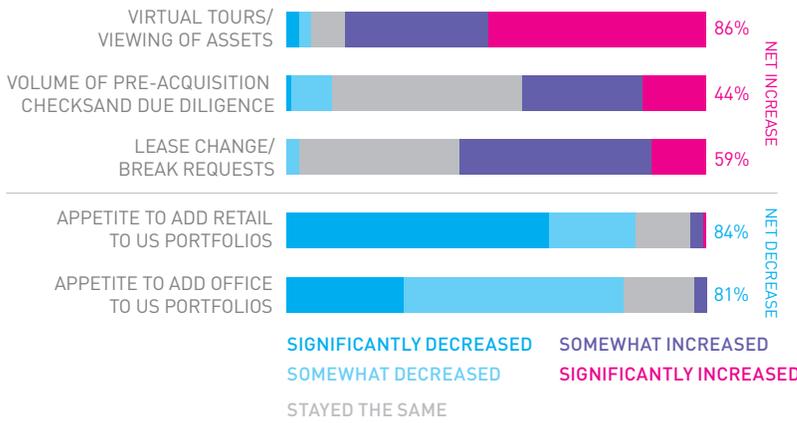
This prioritization of risk management has seen notable changes in standard real estate practices, such as due diligence and lease negotiation processes, as well as appetites for adding retail and office assets to US portfolios (net decrease of 84% and 81%, respectively). Similarly, political and economic risks are forecasted to have the greatest impact on US real estate over the next decade.

EXHIBIT 3: HOW CONCERNED ARE YOU ABOUT THE FOLLOWING FACTORS ON YOUR US REAL ESTATE ACTIVITY?



Risk management has become increasingly critical, especially as our dominant areas of risk—including those related to political, social, climate, and technological concerns.

EXHIBIT 4: HOW HAVE YOUR PRACTICES OR APPETITES CHANGED RE: US REAL ESTATE OVER THE PAST TWO YEARS?



The primary risks detailed in this survey focused on four key areas:

- (1) *environmental risk* (e.g., rising sea levels, weather events, etc.)
- (2) *technological risk* (e.g., phishing, malware, ransomware, etc.)
- (3) *political risk* (e.g., changing tax landscape, regulatory changes, etc.)
- (4) *societal risk* (e.g., civic unrest, labor issues, etc.)

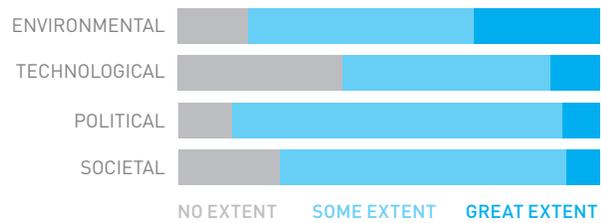
Environmental risks rank the highest almost universally across all three areas, with 83% stating that these risks will affect potential investment value and nearly 60% forecasting climate-related threats to their assets and operations. And consistent with sentiments expressed elsewhere, political issues pose similar degrees of risk, with 87% finding value affected and 75% forecasting a threat to assets and operations.

Environmental risks rank the highest almost universally across all three areas, with 83% stating that these risks will affect potential investment value.

EXHIBIT 5: EXTENTS AND IMPACTS OF KEY RISKS

EXTENT OF RISKS AFFECTING INVESTMENTS

To what extent are these four areas of risk affecting potential value for US real estate investments?



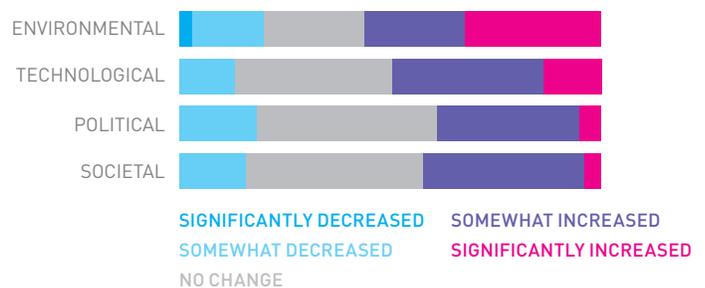
RISK THREATS AFFECTING ORGANIZATIONS

In what way do these four areas of risk potentially threaten your organization?



IMPACT OF RISKS ON US REAL ESTATE INVESTMENTS OVER NEXT 5-10 YEARS

How will these four areas of risk potential value in US real estate over the next decade?

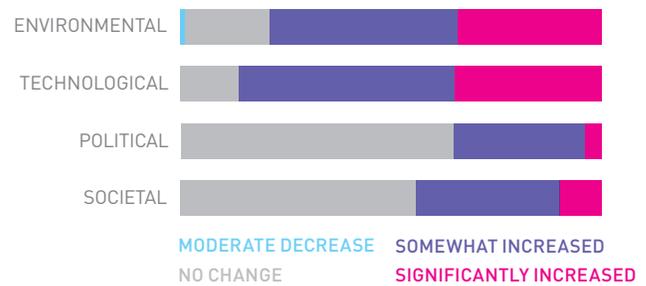


85% of respondents anticipate an ever-accelerating application of technology in the industry, as well as a greater demand for technology.

Because environmental risks rank among the highest areas of concern for investors, respondents also signaled an 78% net increase in risk management expenditures over the next decade. This is led by a forecasted 86% increase in technology and cybersecurity-related spending over that same period. Alternately, anticipated extra spending for political and societal risks is more modest, perhaps reflecting their more immaterial nature.

These increased expenditures are an extension of how respondents are forecasting broader technological, cultural, and consumer changes over the next decade. For example, 85% of respondents anticipate an ever-accelerating application of technology in the industry, as well as a greater demand for technology. And no matter the nature of risk, most respondents (79%) also expect higher insurance premiums in all areas.

EXHIBIT 6: CHANGE IN EXPENDITURE TO MANAGE RISK



FUTURE TRENDS

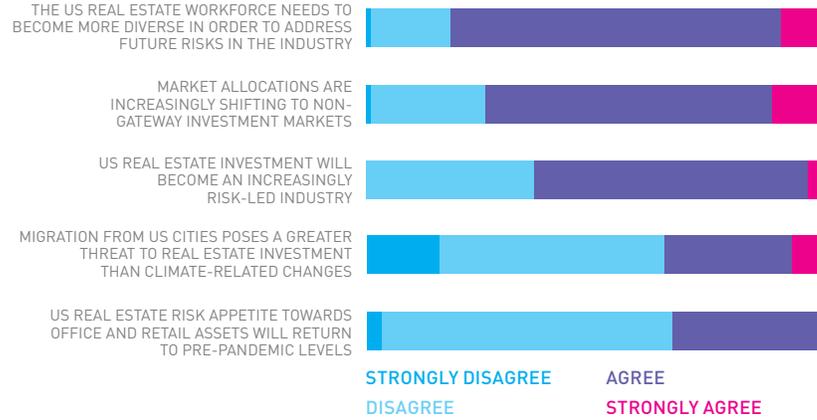
AFIRE's Future Committee is comprised of leaders within the association's global membership and focuses on trends that will help understand the future of real estate investing beyond the visible horizon. For this section of the survey, respondents rated "future factors" likely to have the most significant impact on their investments for the next decade.

Political issues and climate change will be top-of-mind for investors in over the next decade. The connection between workforce diversity and risk management (with 81% agreed) will be critical to future performance, as will the ongoing prioritization of allocations in non-gateway investment markets (74% agreed).

EXHIBIT 7: FUTURE TRENDS AND KEY FACTORS FOR THE NEXT DECADE OF COMMERCIAL REAL ESTATE

FUTURE TRENDS IN REAL ESTATE

To what extent do you agree or disagree with the following statements?



KEY FACTORS FOR US REAL ESTATE OVER THE NEXT TEN YEARS

What changes will shape US investor risk policies over the next decade? (Number of respondent mentions by theme:)



Savvy investors
are those able to
find clarity amidst
uncertainty.



In the various Venn diagrams that could be construed for many of the risk categories and future outlooks detailed in this survey, a four-dimensional model would be needed to fully articulate the interrelationship of the issues affecting long-term value commercial real estate within and beyond the US. For example, as detailed in *Exhibit 7*, respondents overwhelmingly agree that the US real estate workforce needs to become more diverse to address future risk—including simple reputational risk that could affect a company that lacks a diverse workforce.

But at the same time, the calculus for diverse talent development, recruitment, and retention is related to (and informed by) the same economic conditions, political attitudes, and technological trends that are otherwise fanning uncertainties at other tiers of the commercial real estate ecosystem.

Such complexities are inherent in real estate, and savvy investors are those able to find clarity amidst uncertainty. As such, this close-in look at the subtle changes in investor attitudes over the past year ultimately provides an up-to-date snapshot of how the global institutional real estate investor community is thinking about the future: still optimistic, still focused, but even more careful—a shift that is certainly warranted during these challenging times.

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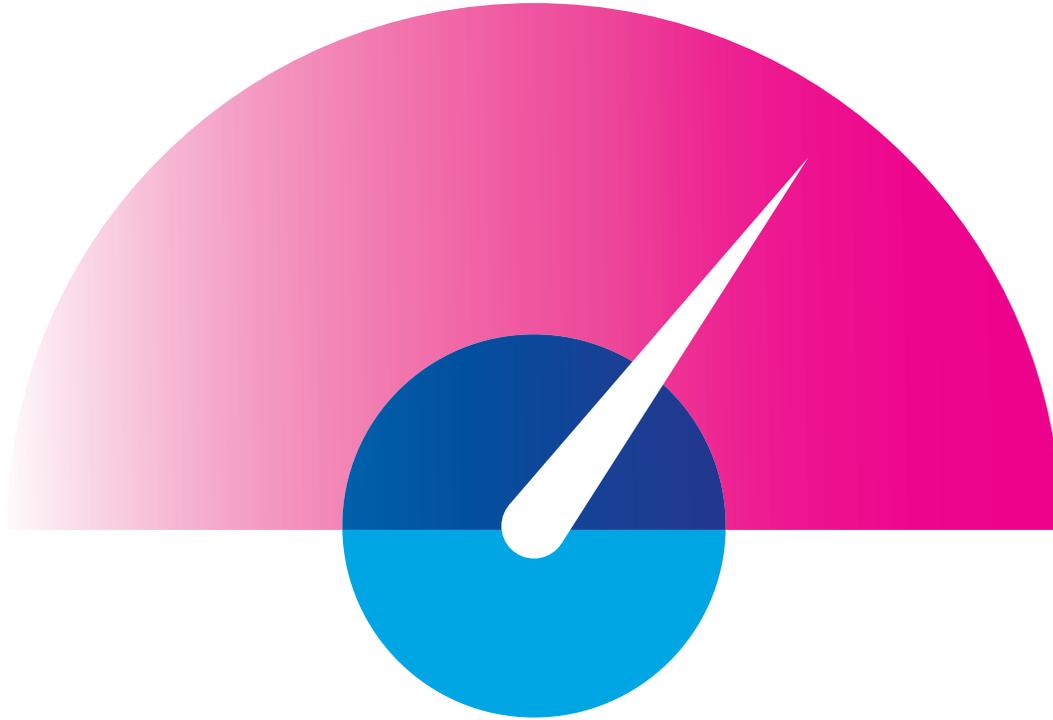
NOTES

The 2021 AFIRE International Investor Survey Report and Mid-Year Pulse Report are underwritten by Holland Partner Group.

¹ AFIRE. “2021 International Investor Survey Report.” AFIRE (April 2021), <https://www.afire.org/of-note/2021afiresurvey/>

² Members of AFIRE represent nearly 190 organizations from 23 countries, with approximately US\$3 trillion in assets under management (AUM). The mid-year pulse survey collected insights from 76 executives representing unique organizations within and beyond the AFIRE membership. Regional participation in the data collection was broadly in line with AFIRE’s overall membership profile, which includes institutional investors, fund and investment managers, family offices, publicly listed companies, and related services. More than half of the respondents to the August 2021 pulse survey also participated in the annual survey, conducted in March 2021.

REASSESSING CLIMATE RISK

**By Jim Clayton**

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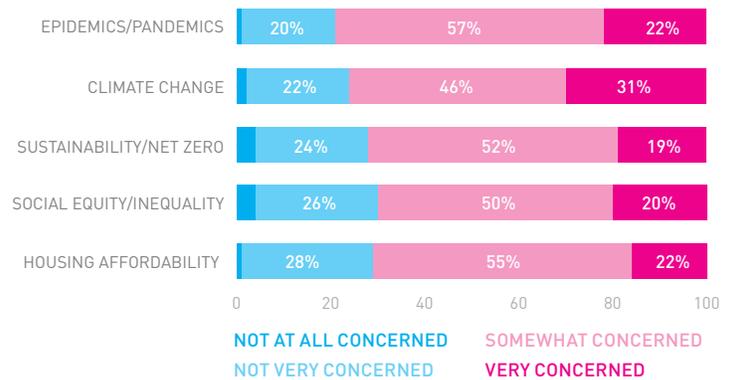
The commercial real estate industry may not yet fully grasp the actual relationship between climate risk and asset pricing and value. But the knowledge is coming fast.

Many institutional real estate investors have significant exposure to cities and regions that are economically important but increasingly susceptible to climate change impacts. Climate change is becoming one of the most important structural forces and risks that long-term investors need to proactively consider in building resilient portfolios. While climate events are not new, there is growing evidence that the frequency, intensity, and geographic spread of climate events have increased in recent decades and this dynamic coincides with the emergence of more chronic events including temperature and sea level rise.

Exhibit 1 provides recent survey evidence that illustrates industry awareness and concern amongst AFIRE members. Almost 80% of responses to AFIRE's annual investor survey indicated that they are either "concerned" or "very concerned" about climate risks. The existence of climate risk does not necessarily mean that investors should avoid or withdraw from those places, allocations, and potential mitigation actions is important to protect or limit impacts on performance.

EXHIBIT 1: GLOBAL REAL ESTATE INVESTOR OPINIONS OF CLIMATE RISK AND OTHER FACTORS

Source: AFIRE International Investor Survey (2021). Percentage totals may not sum to 100% due to rounding.



Recent industry commentary and analysis reveals the challenges associated with incorporating complex risk considerations into valuation and investment processes and decisions. The Urban Land Institute (ULI) in conjunction with real estate investment management firm Heitman lays out many of the issues and explore current industry practice in surveys of industry participants.¹ These reports, consistent with the AFIRE survey, find significant investor awareness.

In going a step further to assess if awareness has led to action, the studies conclude that the industry is in the early stages of incorporating heightened climate risk into the investment and valuation process. Many investors are beginning to work with one or more of the growing rosters of forward-looking climate risk assessment firms to incorporate climate risk into investment and asset management decisions. However, connecting the perceived risk to valuation and pricing is more tenuous.

A major impediment to a rigorous forward-looking assessment of the financial impacts of climate risks on asset values is lack of knowledge and empirical evidence about how property markets have responded to past extreme weather events and how they are responding today to more chronic forces such as sea level rise.

To help fill the gap and investigate this, a team of researchers from University of Reading (UK) and York University (Canada) worked to collate and assess the existing empirical evidence for the extent and channels through which real estate values and prices have responded to recent extreme weather events.² If climate change risks are in fact already recognized by market participants, then their impact should be observable through pricing behavior at purchase/sale or in OpEx/CapEx decisions. They analyzed mainly recently published studies of pricing and investment behavior following extreme weather events for evidence of such impacts. The research revealed a fairly thin and inconclusive empirical evidence base and suggests that the industry has not yet come to grips with quantifying the relationship between physical climate risk and pricing and value.

Historically property markets have managed the damages and disruption from extreme weather.

Insurance, building design and location choices, codes and standards, government infrastructure investment, and governance capacity all contribute to resilience and can support asset values, and there is some evidence that that climate risk is partially capitalized in values. But even if this is the case, this level of risk absorption may be insufficient against the increased projected severity of acute and chronic climatic effects and likelihood of compounding physical and economic harm. It is imperative then to assess the extent to which markets are, or are not, appropriately pricing physical climate risk now and to understand more about the basis against which forward-looking modelling and analyses (services for which are widely available) are being made.³

SHORT-TERM VERSUS LONG-TERM ADJUSTMENT DYNAMICS

There is ample evidence that prices drop after acute climate events, but, generally, the drop is modest and short-lived. This has been shown in residential markets,⁴ and more recently in commercial markets.⁵ These studies and others assessed markets where major storms were more common. This could imply that the threat is realized and that the risks are already capitalized into property prices, but a short-term, myopic approach to investor/owner value and pricing cannot be ruled out.

Some recent research suggests a softening of this dynamic, although this is limited to analyses following Superstorm Sandy. There may even be a permanent post-event price discount which appears to apply to properties directly affected by Sandy, properties that were unaffected directly but within the storm affected area, and potentially coastal properties in other markets not directly affected by Sandy but exposed to similar events.⁶ This last instance may be a case of “belief updating” where risk information is becoming more available and better internalized within individuals and institutions and markets are adjusting accordingly.⁷

LIQUIDITY RISK CONSIDERATIONS

Immediately following climate events, acute market impacts may be assumed; that is, fewer listings and sales and/or lower prices for assets that do sell. Pricing tends to be a lagging or post-hoc indicator of how markets are absorbing physical climate risk so trading volumes or time on market may be better leading indicators. Prices, sale volumes, and velocity should be studied to fully capture the market’s response.⁸ The availability and cost of lender financing and re-financing, as well as insurance, are likely key determinants of investor behavior and liquidity in areas historically subject to climate events, and importantly for areas generally unexposed in the past but subject to shifting patterns and conditions (including chronic factors such as sea level rise).

Research focused on Florida residential markets has looked at prices and volumes for areas exposed to sea level rise and has found that sale volumes declined in more exposed areas relative to less exposed areas even while prices held generally steady (at least until recently). The authors suggested this was driven by a change in buyer demand, as there was, at that time, no evidence for a shift in the practices or availability of insurers/insurance and lenders/credit.⁹

MORTGAGE LENDING AND SECURITIZATION

There has been a lack of academic research on the impact of severe weather events on real estate debt markets and no published academic research that has focused on commercial mortgage markets. Yet credit rating and mortgage analytic firms all have significantly increased their physical climate risk-related analyses of and focus on the mortgage sector, especially in US mortgage-backed securities (MBS) markets, and the municipal finance and infrastructure areas that could ultimately impact property pricing in higher risk locations.

There is evidence, though, that US residential lenders are becoming more aware of risks that could ripple through to default rates and that they are using this information for decisions on which loans to retain versus those sold to government-sponsored enterprises (e.g., Fannie Mae and Freddie Mac) for securitization. These findings pertain to both post-storm behavior as well as areas considered to be at risk from sea level rise.¹⁰

Understanding how property values could be materially affected by the physical impacts of climate change is of paramount importance to investors.

ASSET LEVEL RISK MITIGATION

Insurance clearly supports investor returns and the ability to lend against assets. Obvious risks to both arise if insurance becomes unobtainable, or even if terms such as exclusions, higher excesses and/or significant changes to premiums are seen. There is little evidence yet from the literature that this has been seen. And in fact, the US National Flood Insurance Program (NFIP) may be creating moral hazard and propping up prices¹¹—though proposed changes to the NFIP may offer a case study once information accumulates as most policy holders are expected to see an increase in rates.

For commercial real estate, insurance issues may influence occupier behavior and thus feed into owner cash flow considerations.¹² Owners can improve resilience through actions to ‘harden’ assets against extreme weather and there is anecdotal evidence that some owners and managers are making ‘defensive’ capex decisions to remain aligned with market expectations. This decision-making is complicated by the fact that many climate risks may not yet be properly reflected in CRE market values, so the benefits from mitigation expenditure might not be fully recognized either. To date, insurers have not incentivized resilience expenditure through premium discounts or other market influencing actions.¹³

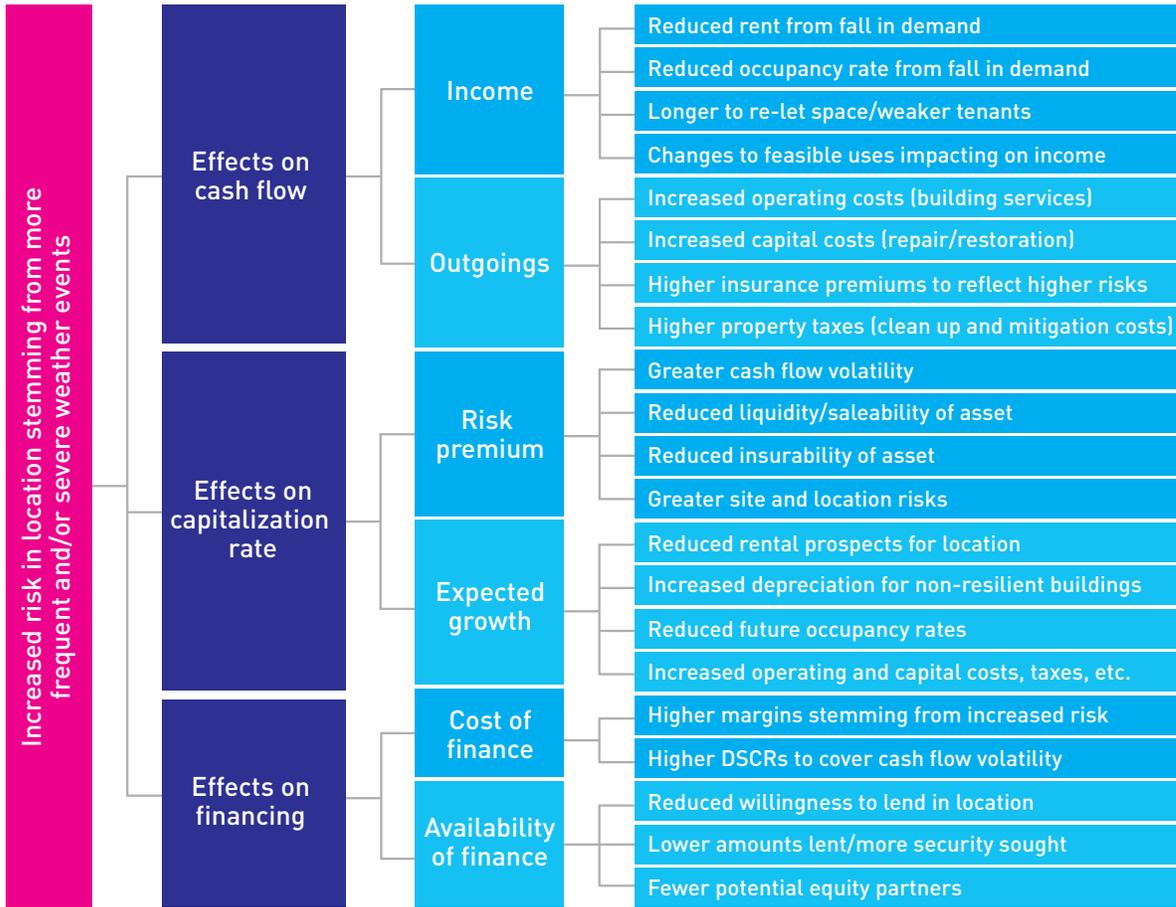
IMPLICATIONS FOR ASSET VALUING AND MODELLING

Understanding how property values could be materially affected by the physical impacts of climate change is of paramount importance to investors.¹⁴ However, the overall picture from the published literature shows a growing but incomplete evidence base. Using geospatial data to highlight potential risk from asset exposure to acute and chronic climatic events is a meaningful first step and one that many institutions have only just begun to take. But clearly more nuanced and actionable information will be needed.

To help conceptualize this, *Exhibit 2* shows potential financial materiality of climate risk on commercial real estate assets. It demonstrates how climate change physical risks could feed through to income-property pricing in a discounted cash flow (DCF) appraisal framework. These risks could be incorporated in valuations through an impact on three primary components: (1) cash flow—leasing fundamentals (rent, rental growth, and vacancy) net of operating expenses and capital expenditures; (2) capitalization rate—affected by capital market conditions including the overall required return that embeds the required risk premium, plus expectations of cash flow prospects (including exit price) and liquidity; and (3) financing—the cost and availability of funds from both equity partners and mortgage debt finance are directly related to return requirements and indirectly to property liquidity.

EXHIBIT 2: ANTICIPATED EFFECTS ON COMMERCIAL REAL ESTATE ASSET PERFORMANCE OF INCREASED EXPOSURE TO CLIMATE RISK

Source: Clayton et al. 2021, developed with reference to de Wilde and Coley (2011)



Most studies to date have analyzed prices, but not the channels through which prices are determined. There is also a lack of clarity on how different market setters and actors evaluate climate risks and influence investor calculations.

Providers of insurance and debt have their own perspectives on climate risk that may impact on pricing of their products, partly driven by their decision timeframes. Investor hold periods may be 8–10 years, and secured lending agreements range from 3–7 years, while insurance premiums are priced annually. This creates cash flow and financing risks which may later exert downward pressure on prices where physical climate risks are identified or

found to be increasing post-acquisition. Similarly, it is unclear on how occupiers will respond to climate events and risks; and advisors and valuers may lack uniform knowledge, instruction in professional standards on climate risk, and access to data which may impact value. Lastly, government regulations for and investments in resilience plausibly contributes to investor confidence, but how much this affects values and prices is imprecise.

IPPC research makes clear that physical climate change is no longer a factor that any real estate investor can ignore. Greater knowledge and more granular data sets are required to discern factors that protect

investment values and returns, but also to inform a debate about how to protect or manage stock which lacks climate resilience. The UNEP FI sponsored research¹⁵ on which this article is based concludes with recommendations for industry and academe to collaboratively engage on data sharing, financial and valuation modelling practices, asset and area resilience investment planning, and CRE focused research. Outputs from such activities can improve the information flow and evidence base for decision-making and help refine valuation and investment allocation practices with emerging risk factors and their inherent uncertainties.

ABOUT THE AUTHORS

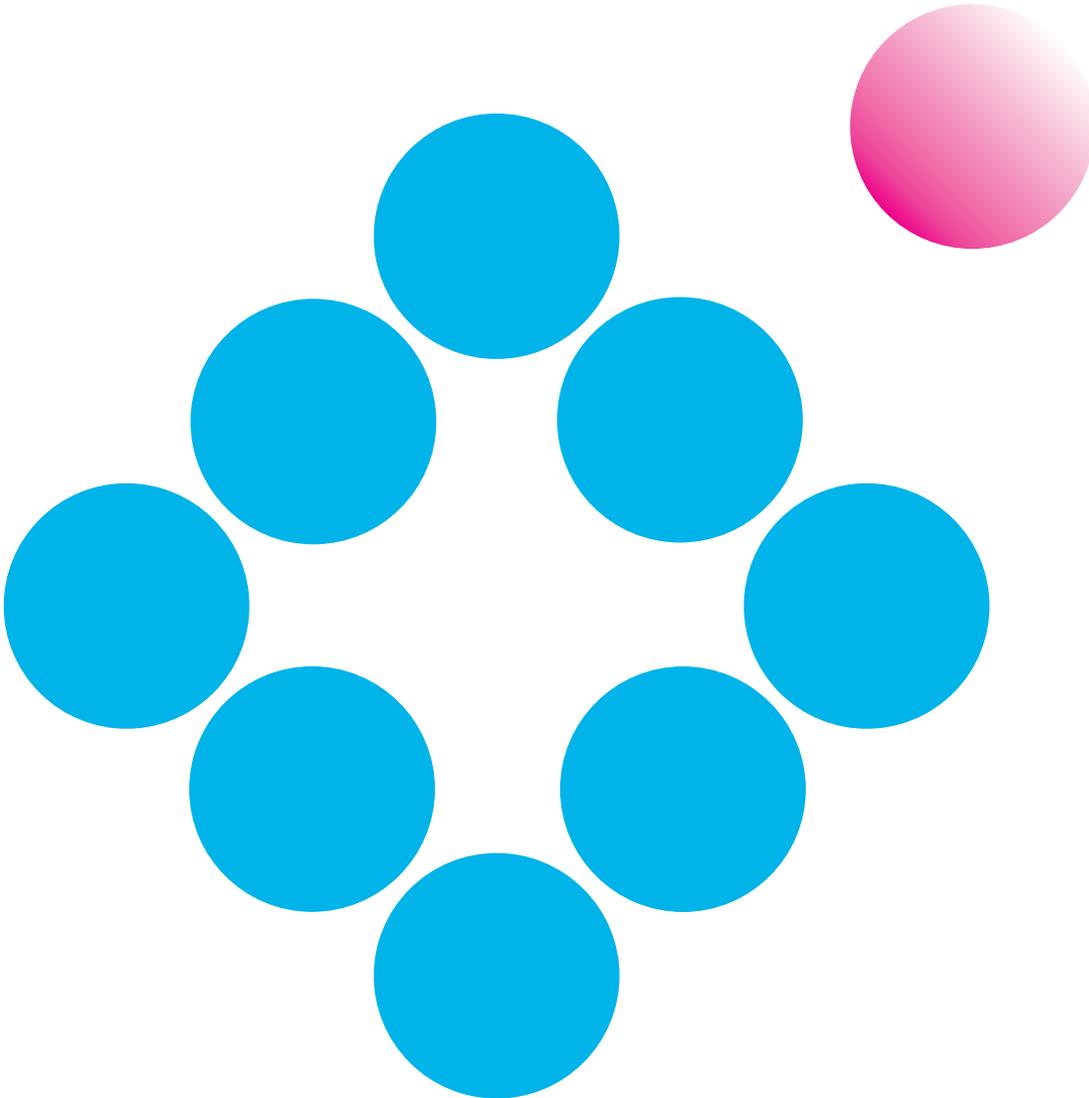
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IPPC research makes clear that physical climate change is no longer a factor that any real estate investor can ignore.

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THE ALLURE OF SPECIALTY SECTORS



By David Wertheim
Senior Director, Client Portfolio Manager
Invesco Real Estate

Real estate investments have historically coalesced around common property types—but it may make sense for investors to reconsider specialty property sectors in the post-COVID world.

Real estate investments have historically coalesced around four broadly defined property types: multifamily, industrial, office, and retail. But in the current environment, it may make sense for investors to reconsider specialty property sectors for a more tailored portfolio approach in the post-COVID world.

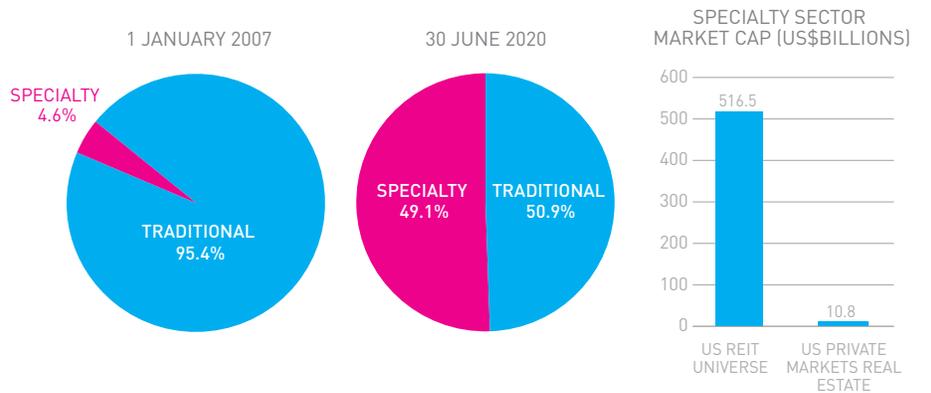
While there is no standard definition of “specialty” property sectors, they include a variety of non-traditional residential and commercial properties. With respect to residential real estate, these specialty sectors span single-family rental (SFR) homes, manufactured housing, student housing, and senior housing.

In commercial real estate, specialty includes data centers, infrastructure, self-storage, life science, and medical office, among others.

The representation of specialty sectors in real estate securities indices has grown tremendously. In June 2020, they accounted for roughly half the collective market capitalization, compared to less than 5% in early 2007. However, in many private market real estate constructs, they still play only a minor role. Whereas the total market capitalization of specialist REITs is now well above US\$500 billion, private vehicles account for a mere US\$10 billion (*Exhibit 1*).

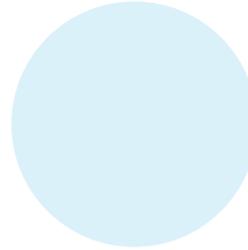
EXHIBIT 1: SPECIALTY SECTORS COMPRISE HALF OF LISTED REAL ESTATE SPACE

Source: Invesco Real Estate using data from FTSE NAREIT and ODCE; as of June 2020. US REIT universe represented by FTSE Nareit All Equity REITs Index. US Private Markets Real Estate represented by ODCE.



Note: Traditional: Apartment, industrial, office, retail, lodging, diversified. Specialty: Healthcare, self-storage, manufactured homes, single-family rentals, data centers, timber, infrastructure, and other specialty.

The most desirable features for tenants often relate to technology ecosystems, power availability and cost, fiber connectivity, and protection from natural disasters.

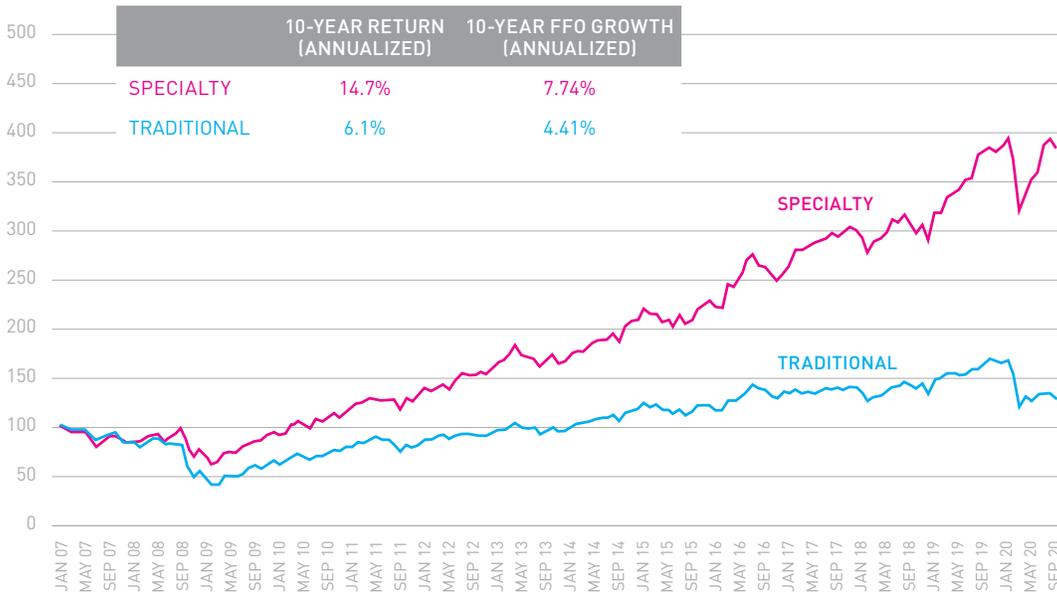


Since early 2007, cash flows in specialty sectors outpaced traditional sectors and, not surprisingly, their annualized returns were more than twice as high (*Exhibit 2*). This robust growth has been spurred by changes in demographics, education, preferences for renting rather than owning, and even downsizing trends. Additionally, several specialty sectors have enjoyed strong tailwinds from technological and medical advancements (*Exhibit 2*).

EXHIBIT 2: SPECIALTY SECTORS HAVE OUTPERFORMED TRADITIONAL REAL ESTATE SECTORS OVER TIME

Source: Invesco Real Estate using data from NAREIT; as of September 2020. Past performance is not a guarantee of future results.

Note: Traditional: Apartment, industrial, office, retail, lodging, diversified. Specialty: Healthcare, self-storage, manufactured homes, single-family rentals, data centers, timber, infrastructure, and other specialty.



DATA CENTERS

Data centers typify a specialty sector that benefits from technological changes, including how society is increasingly consuming data. At the basic level, data centers are secured warehouses containing racks that house network equipment and servers critical for data processing and storage, as well as cloud computing. These facilities provide sophisticated amenities, such as backup generators and industrial air conditioners, to keep computer equipment cool, as well as optical connections for linking business partners and service providers.

While data center shells are relatively simple to build, the complexity of the interior infrastructure requires high upfront capital expenditures and an equally high level of operating expertise, constituting significant barriers to entry. Not surprisingly, lease terms are often 5–15 years, and data center REITs typically enjoy high customer retention rates due to the complexity and cost of moving. Tenants often form network ecosystems through colocation (in part to achieve lower latency and higher speeds), which tends to increase the value of a data center as more tenants choose that location for their operations.

Data center characteristics mean that server racks and digital content are owned and managed by tenants, while the physical warehouse is owned by the data center. The most desirable features for tenants often relate to technology ecosystems, power availability and cost, fiber connectivity, and protection from natural disasters. Furthermore, the lease characteristics are based on the usage of power.

The fundamentals appear robust based on the rapidly increasing data needs of tenants spanning the technology, financial services, and communications industries. The secular growth story is buttressed by the rapid expansion of cloud computing, increasing demand for mobile data, and the inexorable growth of the digital economy. The impact of the pandemic has so far been minimal on data centers, which are relatively unaffected by social distancing and were among the best performing REIT sectors in 2020. The annual size of the global datasphere is expected to triple from 2020 through 2025, and demand from both consumers and enterprises should support the data center business model for years to come.

The annual size of the global datasphere is expected to triple from 2020 through 2025.

INFRASTRUCTURE

As another technology-driven and higher-growth specialty sector, infrastructure includes assets such as cell phone towers and small cell nodes. The largest tower companies are structured as REITs and play a crucial role in enabling wireless communications. Cell towers are the physical foundation of nearly all wireless connectivity. Tower companies own the vertical real estate—usually a tower or pole, often with a land parcel underneath—and the fiber cable underground. Wireless carriers, broadband providers, cable companies, and government agencies lease space on towers to mount equipment, such as cell transmitters. By leasing space on thousands of towers domestically and globally, wireless carriers have built communications networks to handle the ever-increasing volume of mobile data traffic.

Infrastructure companies have benefitted from rapid growth in mobile data consumption as well as increased traffic loads in the burgeoning work-from-home environment. The lease terms for these assets are often 5–15 years, and infrastructure providers typically enjoy high customer retention rates due to the complexity and cost of moving, as well as the lack of viable alternatives in the oligopolistic US market. Furthermore, infrastructure should be a prime beneficiary of the coming wave of 5G wireless connectivity. Initial 5G smartphones are expected to consume 270x data than 2G-era phones, and roughly 3x the data of current phone models.¹

In our view, 5G will help expand the industrial and enterprise use cases for mobile connectivity by enabling a volume of simultaneous connections, data speeds, and ubiquity of coverage that were not previously available. New use cases could include self-driving vehicles, remote health care, smart manufacturing, smart cities, drones-as-a-service, and virtual reality, among others. Simply put, tower and data center REITs are uniquely positioned to benefit from the initial multi-year infrastructure buildout for 5G, and later from the potential step change increase in data transmission that will result from widescale deployments.

SINGLE-FAMILY RENTALS

The residential sector is one of the four traditional pillars of commercial real estate and encompasses several property types: apartments, SFR, manufactured housing, and student housing. The overall sector has performed well over the past several years—right up to the market downturn in February 2020. However, residential has been structurally undersupplied worldwide since the GFC. Additionally, extremely low unemployment rates in the US and other countries have helped support high residential occupancy rates. Strong growth in the young adult age cohort was also a tailwind, as this demographic has a higher propensity to rent.

SFR homes are a specialty subsector of residential and are growing substantially faster than apartments due to their differing characteristics (*Exhibit 3*). The pandemic has accelerated this trend, as many renters now seek a lower-density living environment in a more suburban setting. SFR totals about 15 million units, similar in size to the traditional apartment market, yet SFRs have one of the most attractive multi-year demand profiles in US real estate, according to industry analysts.² Job growth across Sun Belt-focused footprints has been solid, homeownership has been stuck in neutral, and this segment's demographic tailwind should accelerate in the next several years as apartment renters age toward prime SFR years.³ In this regard, as millennials reach adult milestones, they typically seek more living space.

SFR has also benefitted from changing views among millennials and Gen Xers, as fewer of them own a home, want to own a home, or even live on their own, compared to prior age cohorts.⁴ In fact, they value the optionality provided by renting, along with the concomitant increase in mobility. Simply put, the SFR market bridges the gap between apartment living and home ownership.

SFR totals about 15 million units, similar in size to the traditional apartment market, yet SFRs have one of the most attractive multi-year demand profiles.

EXHIBIT 3: SINGLE-FAMILY RENTAL VS. TRADITIONAL APARTMENT RENTAL

Source: Invesco Real Estate; as of September 2020

	SINGLE FAMILY RENTAL	APARTMENT
TYPICAL SIZE	1,600–2,000 SF	600–1,000 SF
TYPICAL LAYOUT	3–4 beds, 2–bath, master-suite, private yard, 2-car garage	1–2 bed, 1–2 bath, community pool, gym, surface parking
TYPICAL RENT	\$1,300–\$1,700	\$1,000–\$1,400
TYPICAL STAY	3–4 years	1–2 years
TYPICAL TENANT	Families and couples	Singles and couples
TYPICAL RENTER AGE	35–54 years	Under 35 years
TYPICAL LOCATION	Suburban	Urban/suburban

Demand for SFR has been strong, in part because of increased demand for lower-density environments in suburban settings. Additionally, extreme financial dislocation for many consumers, combined with stress in the banking sector, has likely reduced the number of renters who can afford the move to home ownership. This, in turn, could lead to higher retention rates for residential landlords.

Finally, a residence is need-to-have real estate, which should warrant priority in a consumer's payment stack. Not surprisingly, the drop in occupancy rates for the residential sector has typically been lower than the drop for many other property sectors during prior economic downturns.

HEALTHCARE AND LIFE SCIENCE

Healthcare is one of the largest segments of the US economy, comprising approximately 18% of GDP. The sector continues to grow faster than the overall economy on the back of a rapidly aging population.⁵ There are multiple segments of the health care sector, but just two of them account for almost 75% of the listed health care REIT space: senior housing and medical office.⁶

However, there is another specialty subsector in health care: life science (i.e., lab space), which we believe is positioned to perform well based on strong fundamentals that remain essentially untouched by COVID-19. Life science accounts for roughly 10% of US health care REIT assets and consists primarily of specialized offices for biotech and pharmaceutical tenants, who use the space to develop new

drugs.⁷ Lease terms are often 8–10 years, and renewal rates are typically high because of the complexity and cost required to build out sophisticated lab space. Demand for this kind of specialized real estate is only expected to grow as a result of the heightened global focus on new drug development.

Historically a niche sector, life science has rapidly gone mainstream in recent years, with an impressive track record. Some real estate investment players are focused on biotech cluster markets like Boston, San Francisco, and San Diego, while others are located on university campuses or near major medical facilities. In terms of asset value, life science has fared the best in the health care sector this year, according to industry analysts, with values virtually unchanged compared to pre-pandemic levels.⁸

In terms of asset value, life science has fared the best in the health care sector this year.



THE BRIGHT SPOTS OF TOMORROW?

Even with current dislocations in the property market, certain specialty sectors could continue to benefit from several potentially sustained tailwinds while facing limited impact from the pandemic.

Despite the many uncertainties surrounding the economy and capital markets, REITs operating in these sectors are poised to benefit from robust demand in relatively supply-constrained markets. This can translate into above-average revenue, cashflow, and earnings growth, which is why these specialty sectors present potentially attractive opportunities for investors.

ABOUT THE AUTHOR

David Wertheim is Senior Director, Client Portfolio Manager for Invesco Real Estate, one of the world's largest real estate managers.

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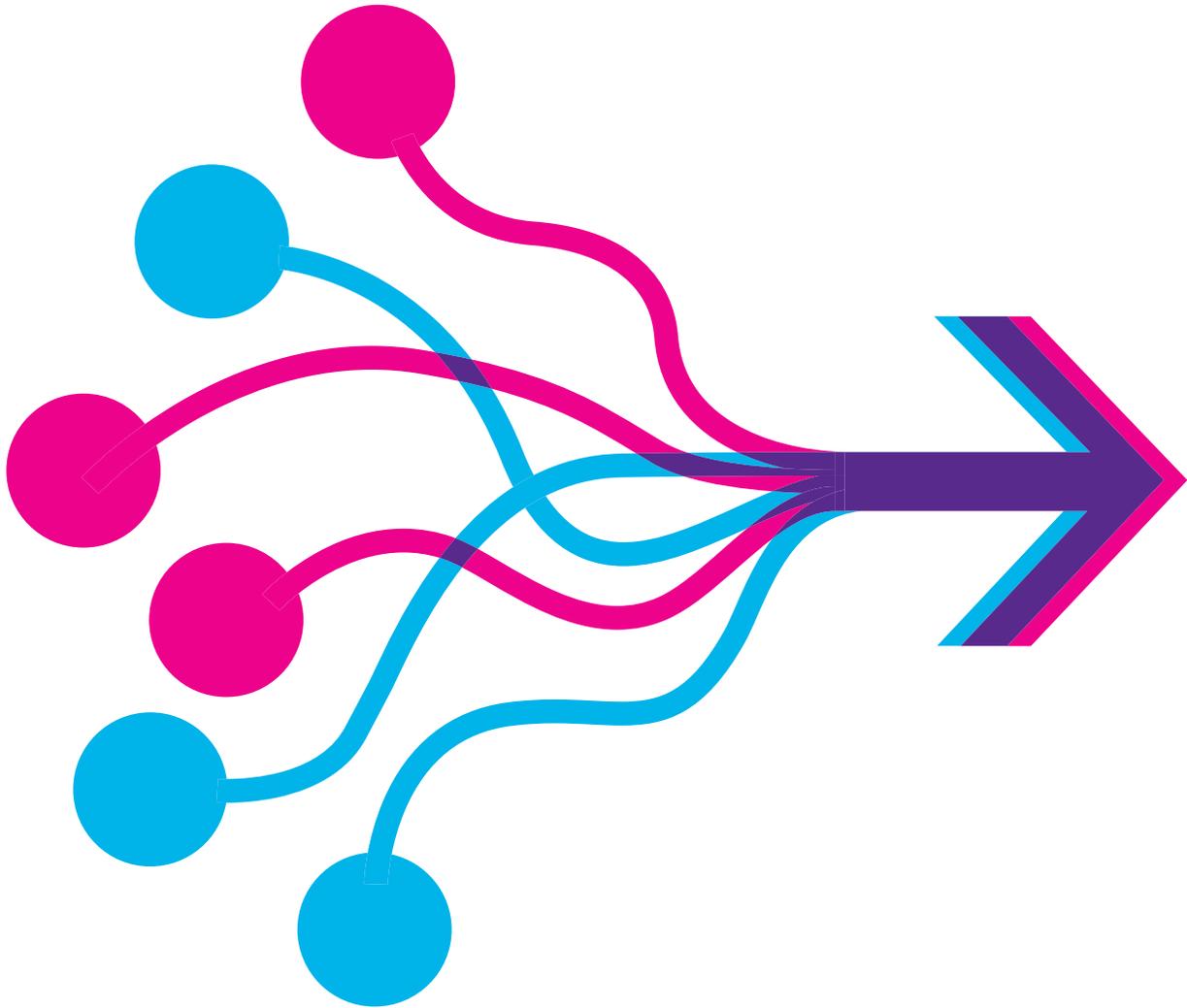
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NON-TRADITIONAL IS GOING MAINSTREAM



By Indraneel Karlekar, PhD
Global Head, Research and Strategy
Principal Real Estate Investors

The mainstreaming of non-traditional property types is well on its way within institutional investing, which will materially broaden the real estate investment universe.

Historically, institutional real estate investors have allocated capital to five property types in the US—office, retail, multifamily, industrial, and hotel. But, in recent years, several niche and emerging property types have seen a significant increase in investor interest and capital allocated, in both the public and private real estate quadrants. According to Real Capital Analytics, as of year-end 2020, these non-traditional property types accounted for approximately 24% of all transaction volume in the US and approximately 56% of total REIT market capitalization.

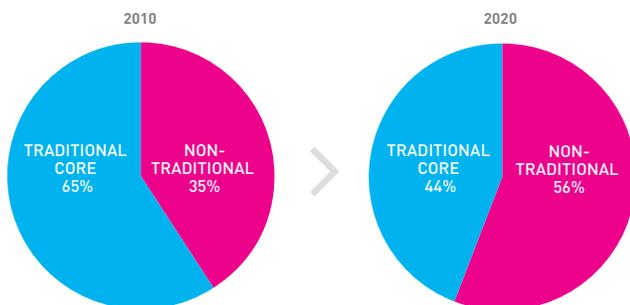
The listed REIT market has spearheaded the push into non-traditional property types (*Exhibit 1*), greatly expanding the investment universe and improving the diversification outcome for investors. Many of the largest REIT companies by market capitalization belong to the non-traditional property type category. Their stable and steady cash flows could augment the growing case for inclusion in a real estate portfolio.

PRIVATE REAL ESTATE INVESTORS ARE RAPIDLY EMBRACING NON-TRADITIONAL PROPERTIES

The past couple of years have seen a significant uptick in investment into non-traditional property types by private real estate investors. Currently non-traditional property types sit at 5–6% within the National Council of Real Estate Investment Fiduciaries (NCREIF) ODCE Index. One expectation is that, on a conservative basis, non-traditional property types could comprise 15% of the ODCE Index by 2030, nearly tripling from current levels. This increase would still trail the experience of listed real estate and be quite comparable, for example, to the growth in the industrial sector in the ODCE Index, which increased from approximately 14% in 2010 to around 20% in 2020 (*Exhibit 2*).

EXHIBIT 1: REITS SPEARHEAD GROWTH OF NON-TRADITIONAL PROPERTY TYPES

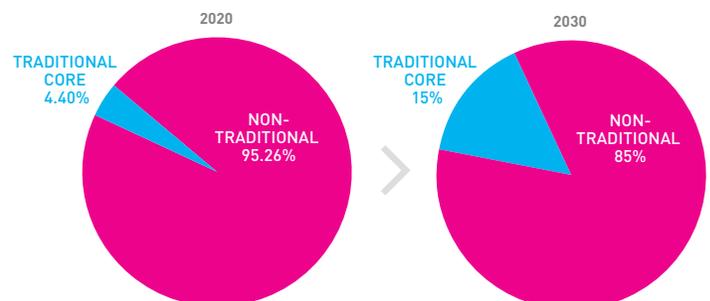
Source: FactSet, NCREIF, MSCI, NCREIF ODCE Index, MSCI US REIT Index; as of 31 December 2020.



Note: Traditional core consists of apartment, retail, office, industrial, and diversified (public market only). Non-traditional consists of specialized residential (public market only), self-storage, hotels and resorts, healthcare, net lease (public market only), data centers (reported within industrial in private market), and other. Due to rounding, figures and percentages shown may not add to the totals or equal 100%. May not reflect current allocations.

EXHIBIT 2: FORECASTED INCREASE IN NON-TRADITIONAL PROPERTY TYPES IN THE NCREIF ODCE INDEX

Source: NCREIF, Principal Real Estate Investors, April 2021



THE GROWTH OF NON-TRADITIONAL PROPERTIES REPRESENTS A SECULAR SHIFT IN DEMAND DRIVERS

The rapid and significant adoption of non-traditional property types in both the listed and private real estate universe is not just a cyclical rotation: it may reflect a structural shift within the economy wherein “DIGITAL” drivers of growth and demand—Demographics, Infrastructure, Globalization, Innovation, and Technology—have become more dominant in recent years.

The pandemic further accelerated these structural changes, in some cases rapidly upturning how consumers and businesses behave and occupy space. These drivers have a clear impact on the growth of both traditional and nontraditional property types—directly and indirectly—given their sheer scale. But diving a little deeper, there are specific sub-themes within the broader DIGITAL framework that tie in to the rise of non-traditional property types and their increasing importance, briefly spotlighted below.

- Demographics: senior living, medical offices and lab spaces, single-family rentals, manufactured housing, self-storage, affordable housing
- Infrastructure: data centers, logistics, warehouses
- Globalization: logistics, warehouses, last mile distribution, cold storage
- Innovation and Technology: life sciences, lab spaces, medical office buildings

LISTED REITS SHOW NON-TRADITIONAL PROPERTIES CAN BENEFIT TRADITIONAL REAL ESTATE PORTFOLIOS

Investors need to understand the benefits to portfolio diversification that non-traditional property types may bring to an existing real estate allocation. The early and rapid adoption of non-traditional property types in listed REITs provides a robust data set of performance metrics and indicates that non-traditional property types have delivered some of the strongest absolute returns over a twenty-year history (*Exhibit 3*). Self-storage, healthcare, and manufactured homes are the property types that stand out for their strong absolute performance over nearly all time periods.

Self-storage, healthcare, and manufactured homes are the property types that stand out for their strong absolute performance over nearly all time periods.

EXHIBIT 3: NON-TRADITIONAL PROPERTY TYPES HAVE DELIVERED SOME OF THE STRONGEST ABSOLUTE RETURNS

Source: NAREIT, Principal Real Estate; as of May 2021

	TRADITIONAL PROPERTIES					NON-TRADITIONAL PROPERTIES				
	APARTMENT	OFFICE	RETAIL	INDUSTRIAL	HOTEL	SELF STORAGE	HEALTH CARE	MANUFACTURED HOMES	DATA CENTERS	INFRASTRUCTURE
TOTAL RETURNS										
3-YEAR	4.6%	-2.0%	-2.9%	18.8%	-4.6%	9.5%	4.3%	18.6%	16.1%	22.1%
5-YEAR	5.7%	2.7%	-3.8%	20.7%	2.7%	4.6%	5.3%	16.8%	15.8%	19.8%
10-YEAR	9.1%	4.9%	5.1%	15.1%	4.1%	15.2%	7.0%	19.3%	NA	NA
15-YEAR	8.1%	3.4%	2.6%	5.6%	1.5%	12.7%	9.1%	14.3%	NA	NA
20-YEAR	10.9%	6.9%	8.9%	10.1%	4.5%	16.5%	12.3%	13.2%	NA	NA
STANDARD DEVIATION										
3-YEAR	20.9%	16.8%	31.7%	12.7%	36.3%	13.7%	26.8%	16.8%	16.0%	12.2%
5-YEAR	16.6%	15.0%	27.1%	12.8%	30.2%	17.6%	21.8%	14.5%	14.3%	11.2%
10-YEAR	16.3%	13.4%	22.9%	14.8%	25.7%	16.5%	18.5%	13.4%	NA	NA
15-YEAR	26.7%	25.9%	30.8%	28.6%	42.6%	21.4%	21.8%	19.1%	NA	NA
20-YEAR	24.2%	23.7%	29.1%	25.6%	39.3%	21.1%	24.4%	18.2%	NA	NA

Correlation analysis further demonstrates the diversification benefit of adding non-traditional property types to a portfolio. While intuitively it would seem that return correlations between traditional and alternative property types would vary, the data does indeed confirm it (*Exhibit 4*).

Despite the growth and maturation of non-traditional property types, correlations have stayed low, indicating the variability of business and operating models that are brought into a portfolio with purely traditional property types. In fact, it is the operating model of many of these underlying companies that helps bring in added diversification to a more traditional portfolio comprised of income-oriented real estate.

Mirroring a similar analysis in the private real estate quadrant is hampered by lack of data but we can infer a certain degree of similarity between the performance of listed and unlisted real estate given the underlying operating and business models are the same. Data centers, self-storage facilities, or SFRs, for example, operate under similar models whether held in listed or private ownership. Most importantly, REIT historical data demonstrates that allocation towards non-traditional property types addresses two key investor requirements: performance and diversification, both of which ultimately benefit portfolio construction.

INVESTORS WILL BE WINNERS AS NON-TRADITIONAL PROPERTIES GO MAINSTREAM

In our view, the mainstreaming of non-traditional property types is well on its way within institutional investing with several positive implications. Non-traditional property types will materially broaden the real estate investment universe and in turn attract a wider array of investors.

The shift and expansion of the universe should also allow investors to generate additional alpha by making conscious investment decisions on their strategies pertaining to alternative property types. Ultimately, we believe the growth and assimilation of non-traditional property types will be a material benefit to the asset class, attracting additional capital and enhancing investment opportunities—and ensuring that investors will emerge as winners.

EXHIBIT 4: NON-TRADITIONAL PROPERTY TYPES ARE PORTFOLIO DIVERSIFIERS

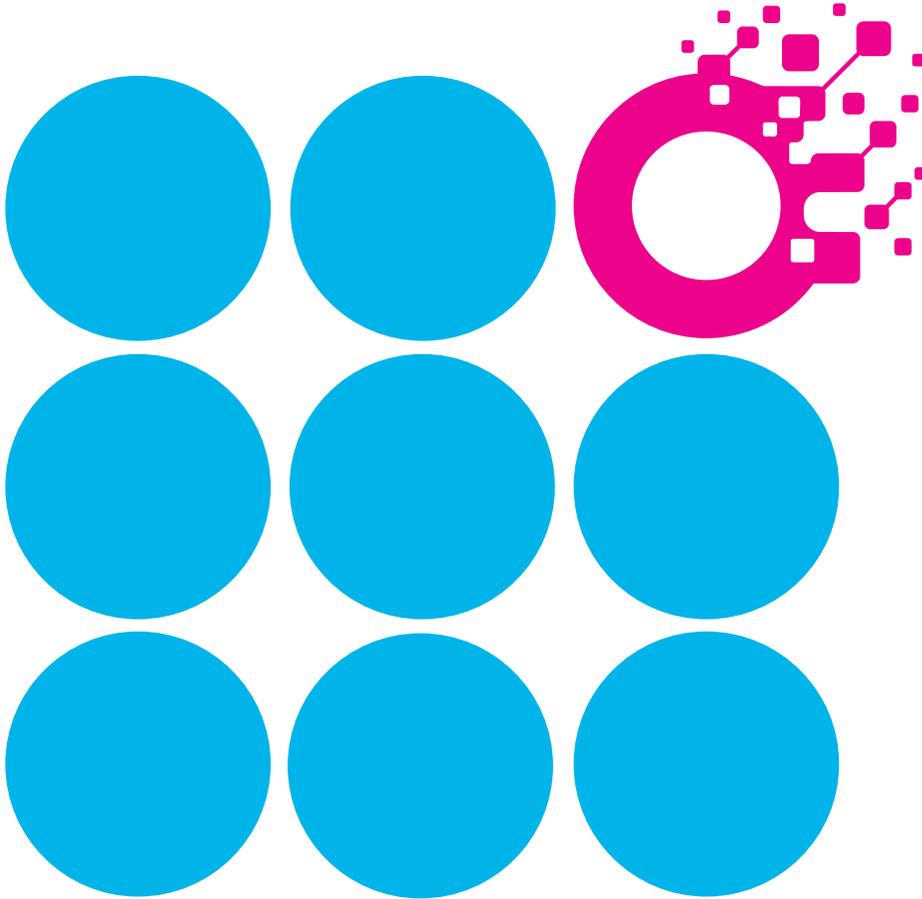
Source: NAREIT, Principal Real Estate; as of May 2021

15-YEAR CORRELATIONS	APARTMENT	OFFICE	RETAIL	INDUSTRIAL	HOTEL	SELF STORAGE	HEALTH CARE	MANUFACTURED HOMES	REGIONAL MALLS	SHOPPING CENTERS	DATA CENTERS	INFRASTRUCTURE	DIVERSIFIED
APARTMENT	1.0000	0.9093	0.8828	0.7158	0.7963	0.8108	0.8028	0.7762	0.7034	0.8347	-0.0586	0.2263	0.9405
OFFICE	0.9093	1.0000	0.8953	0.8283	0.9049	0.7092	0.8126	0.7088	0.6547	0.7489	0.1972	0.2902	0.9706
RETAIL	0.8828	0.8953	1.0000	0.7524	0.8533	0.8028	0.8693	0.7020	0.9659	0.9802	-0.2919	0.0875	0.9376
INDUSTRIAL	0.7158	0.8283	0.7524	1.0000	0.6914	0.5870	0.6339	0.6525	0.1905	0.6156	0.5915	0.6334	0.7776
HOTEL	0.7963	0.9049	0.8533	0.6914	1.0000	0.5762	0.7256	0.5834	0.7337	0.7937	-0.2359	-0.0660	0.8951
SELF STORAGE	0.8108	0.7092	0.8028	0.5870	0.5762	1.0000	0.6760	0.6219	0.6500	0.7221	-0.1652	-0.1540	0.7628
HEALTH CARE	0.8028	0.8126	0.8693	0.6339	0.7256	0.6760	1.0000	0.5997	0.7422	0.8793	-0.1058	0.3320	0.8816
MANUFACTURED HOMES	0.7762	0.7088	0.7020	0.6525	0.5834	0.6219	0.5997	1.0000	0.3720	0.5940	0.2216	0.4395	0.7212
DATA CENTERS	-0.0586	0.1972	-0.2919	0.5915	-0.2359	-0.1652	-0.1058	0.2216	-0.3980	-0.1333	1.0000	0.5532	0.0345
INFRASTRUCTURE	0.2263	0.2902	0.0875	0.6334	-0.0660	-0.1540	0.3320	0.4395	-0.0708	0.2106	0.5532	1.0000	0.2350

ABOUT THE AUTHOR

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DIVERSIFYING INTO DIGITAL



By Warren Wachsberger
CEO
AECOM Capital

Josh Katzin
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As investors look for sustainable sources of inflation-protected yield, real estate investment is increasingly blurring into a wider range of “digital” real asset investment strategies.

As investors look for sustainable sources of inflation-protected yield, real estate investment is increasingly blurring into a wider range of real asset investment strategies—including the growing class of “digital” real estate. Inclusive of physical broadband networks (fiber or wireless), small cell and distributed antenna system (DAS) networks, and data centers, digital real estate shares many of the same attributes as traditional real estate, and in many cases, it benefits from even greater positive tailwinds.

For example, at AECOM Capital, the investment arm of AECOM (NYSE: ACM), a global leader in design and engineering services, we have broadened our mandate from the traditional real estate “food groups” to include digital real estate as well. In this article, we detail some of what has attracted our firm to this space, and how digital real estate might benefit other investor portfolios.

Returns on investment in the digital real estate space compare favorably to what is often seen in traditional real estate development opportunities. In our real estate development strategy, for example, we generally target opportunistic returns with a three- to five-year time horizon. We see similar returns on the development of digital real estate on a five- to seven-year time frame, meaning similar internal rates of return and higher multiples. And these returns are often generated with long-term leases to credit tenants such as telecom carriers, government entities, and Fortune 500 companies.

The tailwinds behind the space are compelling. First, we see strong and growing demand drivers. Digital real estate benefits from the exponential growth of data, as well as from new technologies that are improving the way that we capture, store, and distribute data. Fifth-generation communication networks (5G) are currently being rolled out globally. The deployment and advancements of this new technology has set off a wave of new investment in digital assets. The recent pandemic serves as the ultimate use case (and the possible inflection point) for digital interconnectedness.

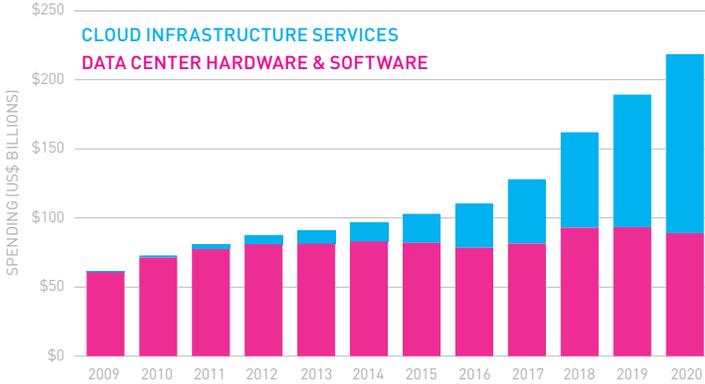
DEFINING DIGITAL TAILWINDS

At its core, the development of digital real estate shares many of the same economic characteristics as traditional real estate development: You are building a physical asset that is monetized by leasing out a finite amount of built capacity, and whose value depends in large part on lease term, tenant credit, and the stability and growth profile of the underlying cash flows. And as with traditional real estate, investors can choose between a range of approaches based on risk tolerance, including core strategies focused on buying assets with stable in-place cash flows, to more opportunistic strategies that aim to create stabilized assets by either building new assets or by fixing existing non-stabilized assets.

Increased mobile device usage, expanded use of cloud computing, expansion of the Internet of Things (IoT), and advancements in artificial intelligence (AI) are all key demand drivers for continued 5G adoption. Corporate information technology spending on cloud computing alone has exploded to well over \$120 billion¹ in 2020, as Amazon, Microsoft, Oracle, and Google have built out dominant positions in the space. We are still in the early stages of the IoT rollout, which is embedding communications technology in our homes, cars, and wearable devices. And expanded use of AI makes the capture of use of large quantities of data increasingly important. As mundane items increasingly become “smart” through internet connectivity, they will need significant digital infrastructure to support them.

EXHIBIT 1: ENTERPRISE SPENDING—DATA CENTERS VS. CLOUD INFRASTRUCTURE SERVICES

Source: Statista, “Enterprise Spending on Cloud and Data Centers by Segment” (May 2021)



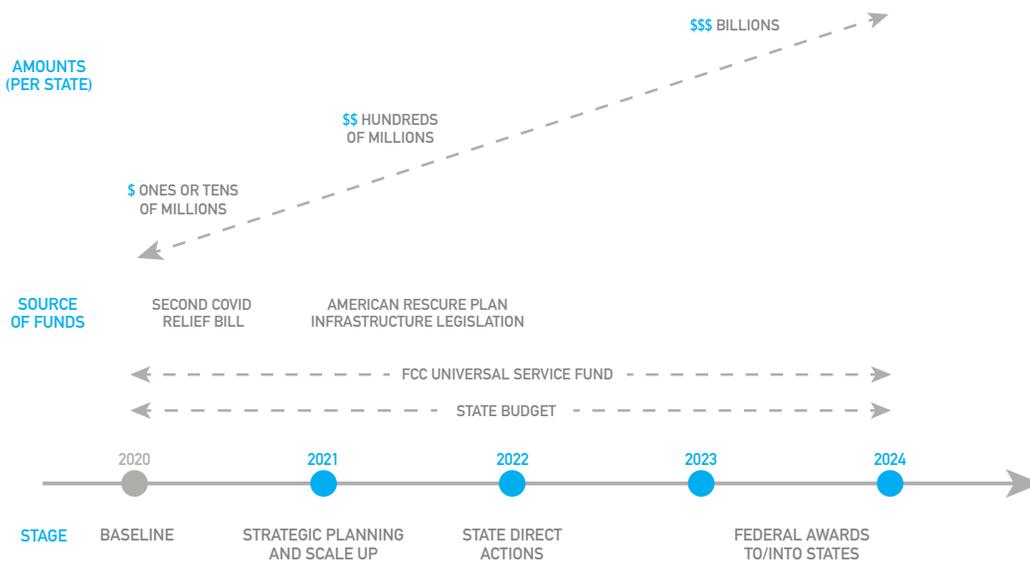
103 bidders won US\$1.49 billion over ten years to provide fixed broadband and voice services to over 700,000 locations across 45 states.

Investment in this space will also benefit from significant federal and state government subsidy, particularly as governments look to rectify the “digital divide” that separates the haves and the have-nots for access to affordable broadband. For example, the Federal Communication Commission has created the Rural Digital Opportunity Fund (RDOF), a US\$20.4 billion initiative created to inject capital into the buildout and maintenance of broadband networks benefiting underserved rural geographies across the US. Hundreds of providers, carriers, investors, and entrepreneurs participated in the RDOF reverse auction and are now quickly seeking equity capital to finance

the initial portion of these high-speed networks. RDOF is also one of several targeted government subsidies meant to incentivize private capital to invest in building out networks that would not be otherwise economically viable. The Connect America Fund Phase II (CAF II) Auction was the preceding federal broadband funding program and was rolled out in 2018; 103 bidders won US\$1.49 billion over ten years to provide fixed broadband and voice services to over 700,000 locations across 45 states. The federal subsidy support from RDOF and CAF II each offer ten years of support with the subsidy distributed in equal monthly installments.

EXHIBIT 2: STATE BROADBAND FUNDING TIMELINE

Source: Quadra Partners, LLC, “Seizing the Moment: Scaling Up State Broadband Strategies” (July 2021)



DIGITAL REAL ESTATE AND ESG TARGETS

Beyond returns, digital real estate investments that have the potential to bridge the digital divide are beneficial to ESG programs. The social and economic impact that digital infrastructure has been proven to reduce poverty, promote inclusiveness, and enhance gender equity. And the need for this type of investment is global: The development of digital infrastructure has, for example, been shown to have a powerful economic effect in developing countries: with every 10% increase in broadband penetration, GDP is increased by 1.38% per year in developing countries, according to the International Telecommunication Union (ITU).² Additionally, ITU studies show that approximately 30 full-time jobs are created for every US\$1 million invested in broadband infrastructure.

For these economic and non-economic reasons, the development of digital real estate is a compelling and growing opportunity for investment portfolios. wherein many cases, demand continues to outstrip supply, which is good for values and returns. Digital real estate also contains the opportunity to improve people's lives by helping to deliver more equal access to digital infrastructure. And importantly, investment in this area helps grow the economy more broadly, helping to drive innovation and the creation of the jobs of the future.

These trends all existed before the pandemic, but they have only been reinforced as we have all become more aware, and more dependent on, the digital infrastructure that connects us.

Digital real estate also contains the opportunity to improve people's lives by helping to deliver more equal access to digital infrastructure.



UNDERSTANDING THE DIGITAL REGULATORY LANDSCAPE

Many digital investment opportunities involve working with governments to meet their policy and operational goals, which requires a collaborative and consultative approach.

Governments often are better at identifying outcomes that they want to achieve than at figuring out how to harness market forces to help them reach those goals. For example, a state Department of Transportation (DOT) may have the goal of offering smart services along its freeways, which requires laying fiber along roadways to provide the necessary broadband coverage.

Capital constraints aside, the DOT would want to roll that out broadly across its road network—a goal that cannot be met within the state's budget. The state might look to private capital to fill the gap. But private capital will typically be interested in funding only parts of that broadband rollout—in areas that are most densely populated, or which suffer from gaps in existing fiber coverage, and therefore are the most commercially valuable.

To bridge this gap between the state's more expansive goals and private capital's narrower commercial interests, a consultative approach is required. This involves more than just bidding in an auction. As is often the case with public-private partnerships, the best outcomes are achieved when the public entity and private commercial partner find a way to work collaboratively to achieve as much of the state entity's goals as possible, within its budget constraints, given the range of commercial opportunities available.

This ability to navigate government entities and know the ins-and-outs of working with them is therefore particularly important for these types of investments.

ABOUT THE AUTHORS

Warren Wachsberger is CEO, Josh Katzin is CIO, and Corbett Kruse is an associate at AECOM Capital, the principal investment arm of of AECOM (NYSE: ACM), a leading global infrastructure company.

NOTES

¹ Statista, "Enterprise Spending on Cloud and Data Centers by Segment," Statista, May 2021, <https://www.statista.com/statistics/1114926/enterprise-spending-cloud-and-data-centers/>.

² International Telecommunication Union, "Economic impact of COVID-19 on Digital Infrastructure," June 2020, https://www.itu.int/pub/D-PREF-EF.COVID_ECO_IMPACT

TAPPING INTO BIOTECH



By William Maher
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Life sciences real estate has been a “hot” property type for the past decade—and even more since the pandemic. Will all the capital targeting the space be placed where it needs to go?

Life sciences real estate (LSRE) has been a “hot” property type for the past decade or so, and interest has accelerated with the advent of the COVID-19 pandemic. The sector benefits from strong demand drivers with limited new supply (compared to demand), although new developers and investors are entering the space. Returns have been strong and capital is likely to flow to life sciences real estate for the foreseeable future.

At the same time, the sector is relatively small and concentrated in just a few markets. In this article, we examine the main attributes of success in LSRE—and explore whether all of the capital targeting the space will successfully find a home.

STRONG DEMAND DRIVERS

LSRE demand comes from companies involved in providing products and services for the healthcare sector. In particular, life sciences companies are focused on the development and commercialization of new drugs and medical devices. The sector benefits from advances in (and the convergence of) technology and medicine, changes in the delivery of healthcare—including highly targeted therapies—and an aging population that requires additional healthcare services. Significant capital sources, including the National Institute of Health (NIH), venture capital, and corporate funding, support the industry’s high R&D costs.

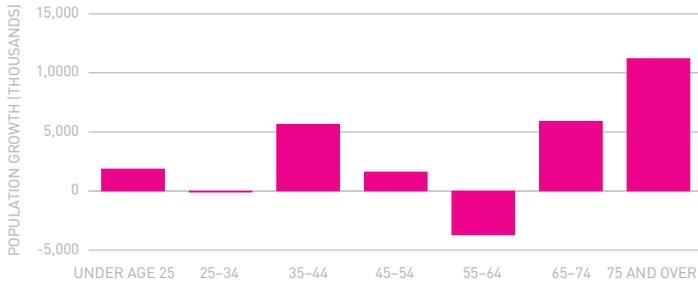
Advances in technology have accelerated the pace of change in biological research, leading to more companies with greater research funding. Emblematic of this rapid change is that the cost of DNA sequencing is decreasing at a rate faster than Moore’s Law.¹ For example, it cost US\$3 billion to map the first human genome in 2003. By 2019, it was less than US\$1,000—and within a decade or less, the cost could be less than US\$100. The result is an acceleration in the growth of emerging platform

technologies, such as messenger RNA (mRNA), which was used to develop the Moderna and Pfizer/BioNTech COVID-19 vaccines. That is just one of the many advances that will likely spur new investments and drive demand for additional life sciences space.

America’s aging population will also drive increasing consumption of health services. The population cohort of those aged 70+ and 80+ made up 11.1% and 3.9% of the US population (36.1 million and 12.8 million people, respectively) in 2020, respectively. Those figures are projected to increase to 14.4% and 5.3% (50.5 million and 18.6 million) by 2030, representing annual growth rates of 2.7% and 2.8%, respectively, significantly outpacing general US population growth of 0.8%. As the elderly populations grows, so will the prevalence of chronic health conditions that require some kind of medication.

EXHIBIT 1: POPULATION GROWTH BY AGE COHORT; 2020-2030

Source: US Census Bureau



Healthcare products account for more than half of the life sciences industry revenue, and the increasing medical needs of the aging US population drives demand for pharmaceuticals. Worldwide drug sales have grown at a compound annual growth rate (CAGR) of 3.5% over the past five years (through 2020), outpacing GDP growth of 1.5% over the same time period. As shown in *Exhibit 2*, drug sales growth is expected to accelerate going forward, with overall sales projected to grow to US\$1.4 trillion by 2026, a CAGR of approximately 7.7%.² Future sales will require significant research and development costs in order to develop new drugs and medical products. Worldwide pharmaceutical R&D spend is forecast to grow at an annualized rate of 4.2% between 2020 and 2026. (See *Exhibit 3*)

EXHIBIT 2: WORLDWIDE PRESCRIPTION DRUG SALES AND FORECAST, 2016-2026

Source: Evaluate Pharma

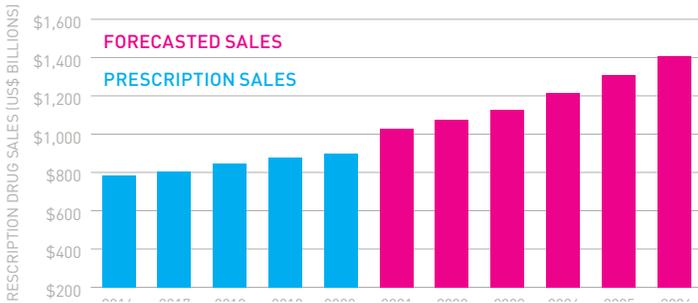


EXHIBIT 3: WORLDWIDE PHARMACEUTICAL R&D SPEND (US\$ BILLIONS)

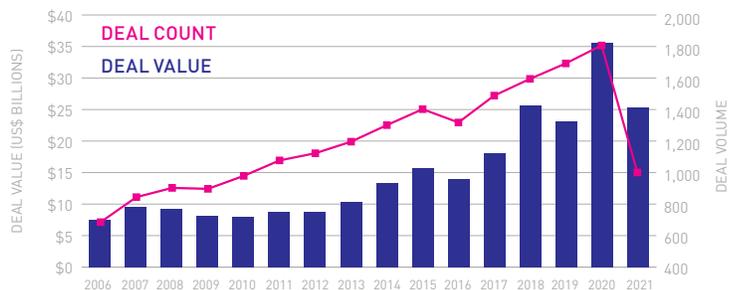
Source: Evaluate Pharma



This outsized growth has brought a substantial influx of capital from both public and private sectors. Life sciences venture funding flowed at a historic pace in 2020, and 2021 is on pace to set an all-time high for both deal volume and capital raised (*Exhibit 4*).

EXHIBIT 4: US VENTURE CAPITAL DEAL ACTIVITY IN LIFE SCIENCES

Source: Pitchbook Venture Monitor; as of 30 June 2021



SPECIALIZED KNOWLEDGE REQUIRED

Investment in life sciences real estate requires a deep understanding of the sector and specialized knowledge regarding tenants and operations. Expertise in lab design and implementation is crucial, creating a barrier to entry for traditional office operators trying to develop or convert existing office space into lab space. Some of the additional physical requirements include increased building ventilation systems, cleanrooms, more plumbing capacity throughout the building, higher power capacity, and higher floor-to-floor heights.

Another important reason for specialized knowledge is one of the asset type's greatest value drivers: reusability. Freshly delivered life sciences space has an average use-life of around fifteen years before renovation is required, while the average lease term is only around 7–10 years—creating ample room for second-generation leases at a high net effective rent, for a fraction of the upfront TI requirements. However, tenant build outs must be designed to offer the greatest flexibility for second (and later) generation tenants.

Additionally, relationships are key in the life science space, particularly in attracting tenants. LSRE is typically mission-critical space for most tenants, who therefore place a premium on leasing space from a reliable operator. Relationships are even more crucial in speculative developments, which must cater to a wide array of tenants, and build-to-suit projects, where the tenant will rely on an established operator.

Evaluating the credit quality of the tenant also requires specialized knowledge. Life science tenants range from start-ups to growth companies to established, publicly traded pharmaceutical companies. Many of the start-up and growth companies are cash flow negative with a limited history, making the understanding of products and financial backers key to underwriting tenant credit.

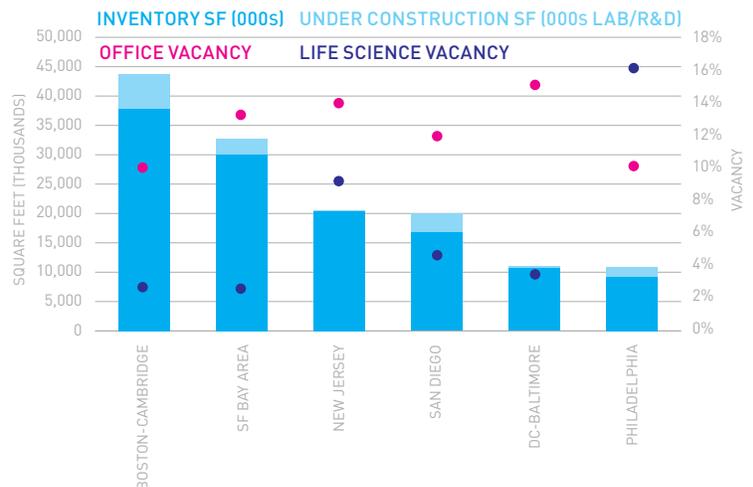
PREFERRED MARKETS

Life sciences tenants have concentrated in cities with an educated workforce, access to key industry scientists, highly ranked schools, a sizeable high-tech workforce, and access to funding. The top three life sciences markets are Boston, San Francisco, and San Diego, which comprise more than half of all life sciences space in the US. These cities provide access to quality graduates in biological and biomedical sciences as well as PhD-level candidates from nearby academic institutions and hospitals. Other markets with significant life sciences sectors include New Jersey, Philadelphia, and Washington, DC, while markets such as Raleigh/Durham and Seattle could develop sizable life sciences clusters over the next decade.

Market fundamentals for life sciences and lab space are attractive, both historically and expected going forward. While life sciences inventory is still a fraction of traditional office inventory, at approximately 4% of office inventory, LSRE makes up more than 10% of office inventory in Boston, New Jersey, and San Diego. Vacancy rates in the top life sciences markets are well below office vacancy rates (with the exception of Philadelphia), as shown in *Exhibit 5*. Rental rate growth has nearly averaged double digits over the past five years, significantly outpacing rental rate growth across most other property types. With demand expected to outstrip supply for the short and intermediate term, Green Street forecasts that LSRE NOI growth will outpace both gateway office and commercial real estate over the long term.³

EXHIBIT 5: TOP SIX US LIFE SCIENCE MARKETS BY INVENTORY

Source: CBRE; Q1 2021



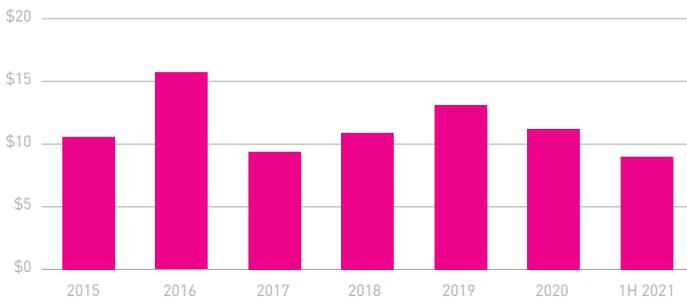
Investor interest coming out of the pandemic has led to record volume so far in 2021.

INVESTMENT CONSIDERATIONS

The growth of the life sciences industry coupled with a limited new supply has attracted the attention of commercial real estate investors. While sales activity has been relatively stable over the past six years (with the exception of 2016 and 2019), investor interest coming out of the pandemic has led to record volume so far in 2021. Transaction volume through June totaled US\$9.0 billion (*Exhibit 6*), on track to exceed the prior peak in 2016 when Blackstone took Biomed Realty Trust private.

EXHIBIT 6: LIFE SCIENCE SALES VOLUME (US\$ BILLIONS)

Source: Newmark Research

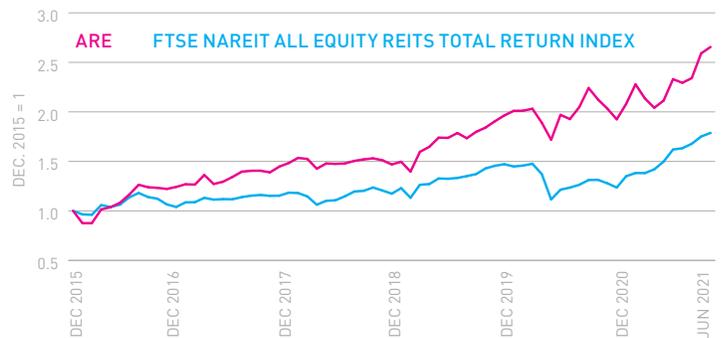


LSRE cap rates have decreased from 8.6% in 2010 to 6.1%, a record low, according to Real Capital Analytics. Cap rates for the sector have historically tracked office cap rates but are now approximately 40 BPS lower, reflecting declining investor interest in traditional office and increasing investor interest in life sciences. Relative to industrial and multifamily, two more in-demand property types, life sciences cap rates remain between 30 to 110 BPS above these property types, respectively. Despite a lower cap rate than traditional office, LSRE cash flows are expected to be higher, as compared to traditional office, LSRE typically has higher tenant renewal rates and lower tenant improvement costs.

Investment returns in the private market are difficult to track as life sciences makes up a small component of major real estate return indices such as NPI and NFI-ODCE.⁴ However, the performance of the one LSRE REIT that is publicly traded—Alexandria Real Estate Equities (ARE)—compared to the overall REIT benchmark shows clear outperformance over the past 5+ years (*Exhibit 7*).

EXHIBIT 7: ARE VS. NAREIT ALL EQUITY REITS (TOTAL RETURN); GROWTH OF US\$1

Source: NAREIT



Investing in LSRE is not a risk-free proposition. As discussed above, many life sciences companies have little or no revenue, and they are therefore reliant on positive research results to have continued access to capital. As a small sector, new supply is always a risk, particularly in the current environment when high general office vacancy rates may lead to an increase in conversions. Finally, the biotech and pharmaceutical industries are highly regulated and dependent on government agencies for both drug approvals and pricing power.

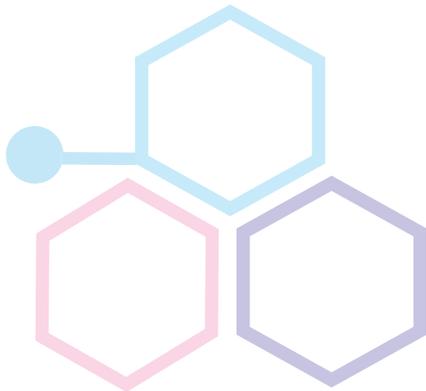
Relative to industrial and multifamily, two more in-demand property types, life sciences cap rates remain between 30 to 110 BPS above these property types, respectively.

Strong demand for space from biotech and other companies should continue to drive rent growth and total returns despite the low cap rates.

WHAT'S NEXT FOR LSRE

Investor interest in life sciences real estate is robust, leading to rich pricing and record low cap rates and high transaction volumes. New entrants have entered the market to capitalize on the strong investor interest, contributing to an increase in supply. However, the strong demand drivers should continue to lead to absorption keeping pace with supply. Cap rates are at record lows, but that is the case with most real estate sectors.

Life sciences real estate is priced at spreads that are similar to other property types with strong demand drivers and keen investor interest. Strong demand for space from biotech and other companies should continue to drive rent growth and total returns despite the low cap rates. Although the overall size of the sector is limited, institutional investors that can develop relationships with operators with expertise in the right markets should continue to find opportunities and generate attractive returns.



ABOUT THE AUTHORS

William Maher is Director of Strategy & Research; Ben Maslan is Managing Director; and Cecilia Galliani is Vice President for RCLCO Fund Advisors (RFA). RFA is an affiliate of RCLCO (formerly Robert Charles Lesser & Co.), which has been the “first call” for real estate developers, investors, the public sector, and non-real estate companies and organizations seeking strategic and tactical advice regarding property investment, planning, and development since 1967.

NOTES

RFA aims to improve the institutional real estate investment model by providing customized and aligned consulting and advisory solutions to LP investors, facilitating partnerships that generate greater LP control and transparency, and driving long-term objectives in allocation, access, diversification and performance with greater fee effectiveness. RFA was established in 2011 and has been an SEC Registered Investment Advisor since 2014.

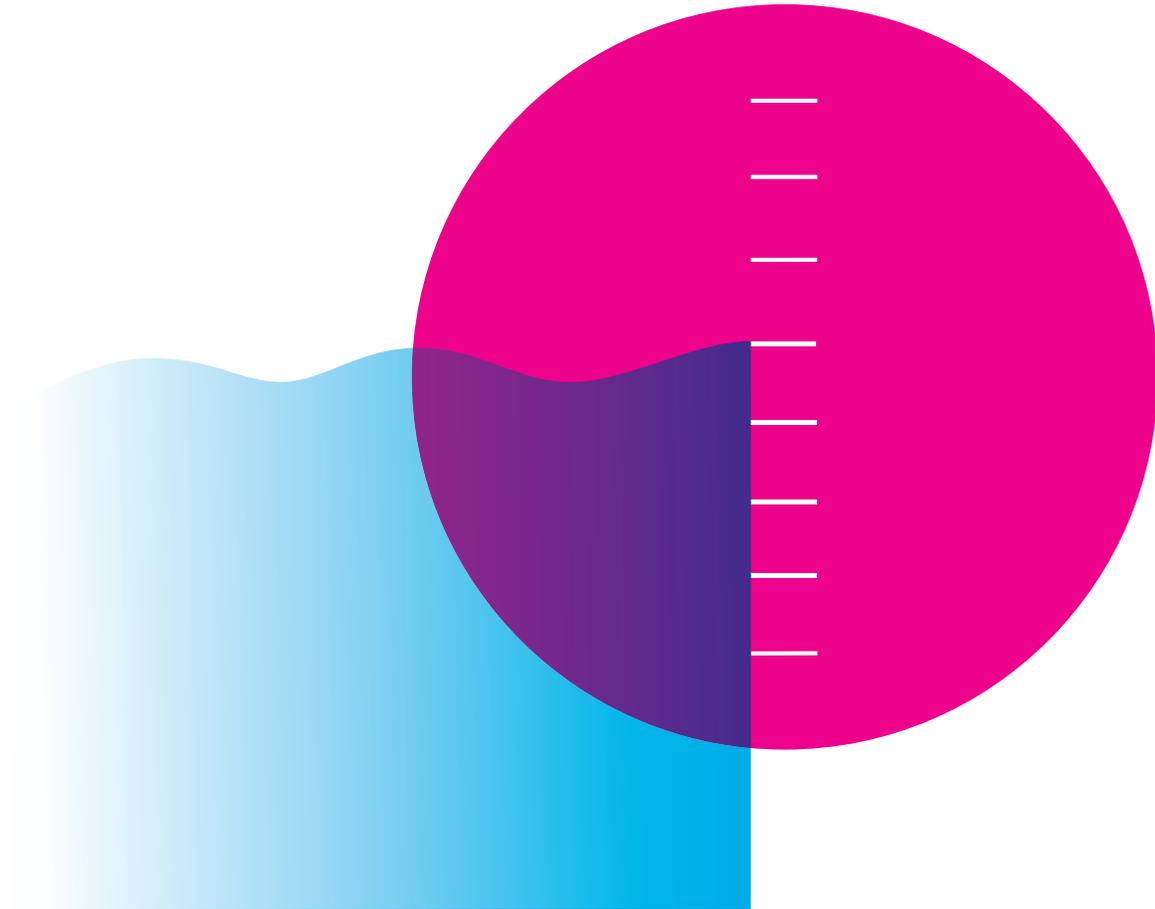
¹ Moore's law is the observation that the number of transistors in a dense integrated circuit (IC) doubles about every two years.

² Evaluate Pharma, “World Preview 2021, Outlook to 2026,” Evaluate Pharma, July 2021, https://info.evaluate.com/rs/607-YGS-364/images/WorldPreviewReport_Final_2021.pdf

³ Green Street, s.v. “Life Sciences Insights,” Accessed July 15, 2021.

⁴ National Council of Real Estate Investment Fiduciaries, s.v. “Property Index, Accessed July 15, 2021; National Council of Real Estate Investment Fiduciaries, s.v. “Fund Index, Open End Diversified Core Equity,” Accessed July 15, 2021.

HIGH-WATER MARKS



By Jerry Speltz
Head of US Real Estate Engineering
Barings Real Estate

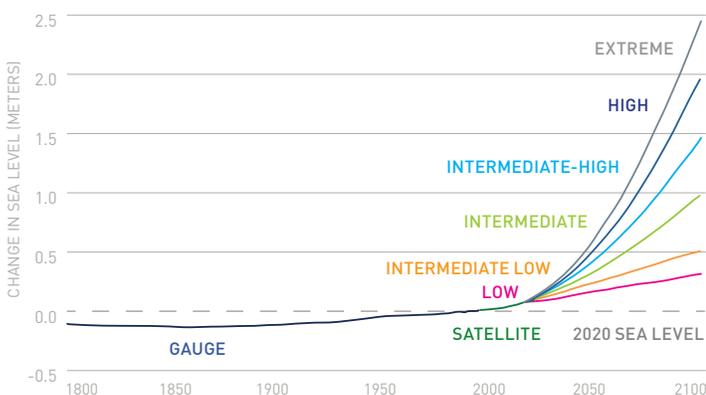
Interest and excellence in ESG performance is becoming increasingly critical to portfolio strategy. So with sea levels on the rise, how can portfolios stay above water?

As investors focus more each day on environmental, social, and governance (ESG) considerations, one risk that should increasingly come into focus is the rise in sea levels globally. There is no longer much of a debate around if sea levels are rising—they are, and they’ve risen by eight inches globally since 1880, and faster since 1900, than in any preceding century for at least 3,000 years.¹ But the evidence suggests that this pace is accelerating materially, with some areas along the US East Coast and Gulf of Mexico seeing eight-inch rises in the last fifty years alone.²

Today, the debate has moved from if to how fast sea levels will rise from here. This is a function of a variety of interrelated factors that include greenhouse gas emissions, global temperature rises, and the rate of melting ice. The National Oceanic and Atmospheric Administration (NOAA) has summarized the debate by publishing a hundred-year forecast incorporating the latest science. They forecast a twelve-inch global sea level rise by 2100 at the “low” level, and an approximately six-foot rise at the “high” level.

EXHIBIT 1: POSSIBLE FUTURE SEA LEVELS FOR DIFFERENT GREENHOUSE GAS PATHWAYS

Source: NOAA and Climate.gov



Note: Observed sea level from tide gauges (dark blue) and satellites (dark green) from 1800–2015, with future sea level through 2100 under six possible future scenarios (colored lines). The scenarios differ based on potential future rates of greenhouse gas emissions and differences in the plausible rates of glacier and ice sheet loss.

ASSESSING THE RISKS

From a real estate investor’s point of view, assessing the risk of such potentially dramatic changes can be a challenge, but steps can be taken to begin to quantify exposure and to mitigate risks. The risks to real estate assets range from periodic flooding to chronic inundation, which not only damage property but limit tenants’ ability to conduct business.

Eight of the world’s ten largest cities are in or near coastal areas—suggesting that the economic activity potentially at risk cannot be understated. In the US, almost 40% of the population is clustered in high-density coastal areas, which are prone to flooding, shoreline erosion, and hazards from storms.

Indeed, a recent NASA study indicates a rise of two feet above today’s sea level would put more than US\$1 trillion of property and structures in the US at risk of inundation, with roughly half of that exposure concentrated in Florida.³

Other coastal states with large areas of low-lying land, including California, Louisiana, North Carolina, and South Carolina, also look particularly vulnerable to rising seas and coastal storm surges.

TIME FOR ACTION

Negative impacts to communities in these regions are almost certainly on the horizon, but there is hope. With some foresight and planning, it should be possible to reduce future losses through strategies that include mitigation and diversification.

While one might expect the impact from sea level rise to be gradual, experience suggests otherwise. More likely, the effects of sea level rise will be subject to “tipping points” triggered by such events as major storm surges from hurricanes, and the inundation of (or damage to) key infrastructure, such as ports, highways, bridges, and treatment plants.

Some jurisdictions are better suited than others to respond to inundation. In Manhattan, for example, the protected nature of the island, the intense urbanization, and the value of the real estate make the consideration of sea walls and mitigation efforts reasonable.⁴ For cities like Miami, however, there is no similarly reasonable solution. And in smaller communities, the available solutions may not prove cost effective even when feasible. Additionally, much uncertainty exists around who would pay for such solutions, and it would likely take years of political negotiations to structure tax plans and insurance policies to effectively protect at-risk properties. Managed retreat is an equally complex political problem, where consensus is nearly impossible.

With some foresight and planning, it should be possible to reduce future losses through strategies that include mitigation and diversification.

MAKING A PLAN

With the dollar value of the potential risk so high, analyses of sea level risks are likely to strongly influence investment strategies with exposure to coastal areas in the coming decades. Tactically, there are actions that can be taken today to begin to quantify and mitigate such risks, including:

- **ADVANCED MODELING:** Through the use of increasingly sophisticated technology, property owners and investors can gain a better understanding of which buildings and market areas are most vulnerable.
- **MONITORING ACCUMULATION:** By leveraging the output of the models, property owners can focus on where to monitor accumulation most closely.
- **PRE-ACQUISITION SEA-LEVEL RISE PROTOCOLS:** Bolstering and strictly adhering to multi-step, pre-acquisition, sea-level risk analyses for properties in vulnerable areas should better inform pricing and acquisition decisions.
- **BUILDING ABOVE CODE REQUIREMENTS:** It is far cheaper to build to higher standards than to mitigate flood risk.
- **PRUDENT ASSET MANAGEMENT:** Judicious capital investment, suitable insurance programs, and informed emergency response plans to protect existing portfolio assets are crucial to helping tenants continue business without interruption through flooding events.
- **PUSHING FOR SOLUTIONS:** This can include everything from analyzing the cost and feasibility of solutions, such as seawalls, to advocating for revised zoning regulations.
- **REDUCING EXPOSURE IN HIGH-RISK MARKETS:** Properties in areas where tourism and recreation become less attractive—and other business activities become more cumbersome and expensive due to increased flooding risks—will likely represent less attractive investments over time, and therefore, will be strong candidates for divestment.

PUTTING THE PLAN INTO ACTION

To help understand how such analyses and mitigation plans are structured, it is worth a closer look at the process that is undertaken. As part of this closer look, the Barings Real Estate team has conducted sea level risk analyses and mitigation plans for multi-billion dollar real estate portfolios with broad exposure to coastal regions across hundreds of individual debt and equity investments.

The first step in assessing such risks is a three-part analysis conducted at the portfolio level:

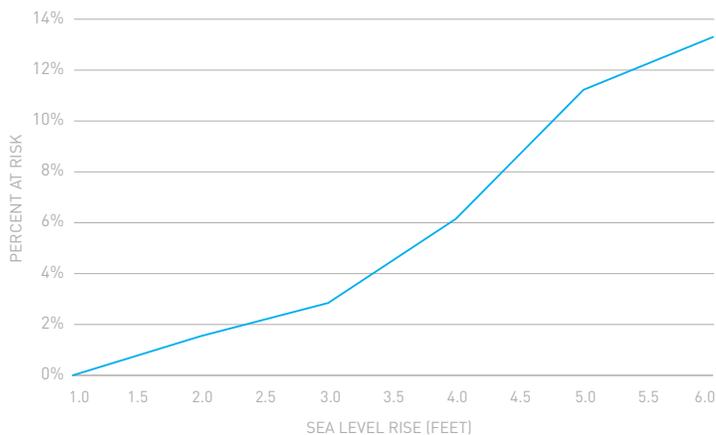
- **LEVEL 1:** A site-level estimate of depth of flooding based on NOAA's global sea level rise scenarios
- **LEVEL 2:** An analysis of the probabilistic exposure to sea level rise over time including low, moderate, and high estimates of sea level rise scenarios for 2030, 2040, 2050, 2060, and 2070
- **LEVEL 3:** A community-level risk assessment and accumulation estimate based on the tracking of at-risk markets for events and changes that may impact the entire market as opposed to a single asset

As a result of this analysis, it is possible to quantify the number of properties within the portfolio that are exposed to inundation risk based on the NOAA's low-, medium-, and high-level scenarios. Of course, the dollar portfolio value that is actually exposed to such risk varies dramatically as scenarios change.

In the hypothetical example in *Exhibit 2*, for instance, a one-foot rise from current sea levels resulted in minimal property value exposure, but that exposure rose to approximately 13% of the portfolio under the six-foot rise scenario.

EXHIBIT 2: PERCENTAGE OF HYPOTHETICAL PORTFOLIO VALUE AT RISK

Source: Barings. Illustrative example only.

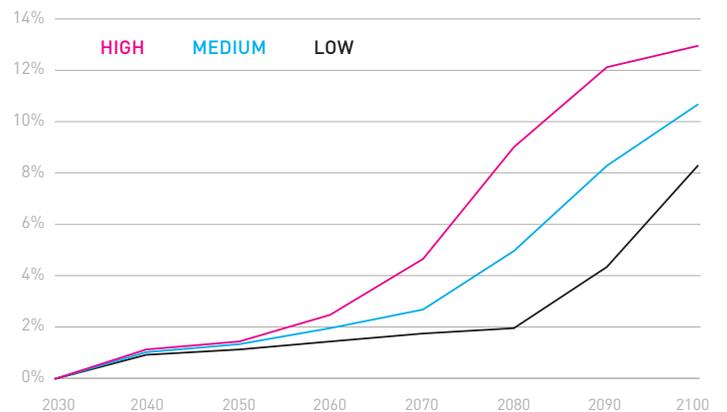


Rise from current sea levels resulted in minimal property value exposure, but that exposure rose to approximately 13% of the portfolio under the six-foot rise scenario.

Looking at it another way, and taking into account NOAA's various scenarios over multiple decades, the next step is to hone in on approximately when the risks begin to increase for the portfolio, as shown in *Exhibit 3*.

EXHIBIT 3: ASSESSING THE PERCENTAGE OF PORTFOLIO VALUE EXPOSED TO SEA LEVEL RISE OVER TIME

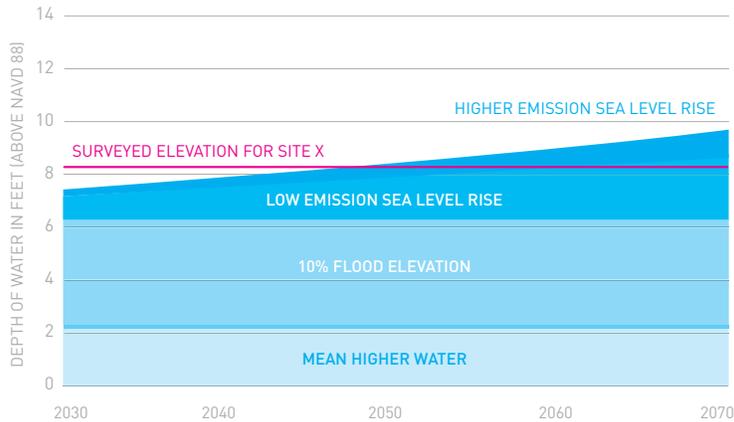
Source: Barings. Illustrative example only.



Finally, a property-level assessment is conducted for any asset considered "at risk" to provide more detail around which scenarios pose the greatest risks. This analysis takes into account not only the impact of global sea level rises, but also nuisance flooding, which is typically not deadly or dangerous, but can still have material impacts on a property values; for example, if a nearby bridge or road being inundated makes the property inaccessible. A sample visual of this analysis is shown in *Exhibit 4* (next page).

EXHIBIT 4: PROPERTY-LEVEL ANALYSIS OF FLOODING RISK

Source: Barings. Illustrative example only.



Note: The North American Vertical Datum of 1988 (NAVD 88) is the official vertical datum of the United States. It is a geodetic datum, or reference surface of zero elevation to which heights are referred to over a large geographic extent.

In addition to quantifying and creating a more holistic understanding of the climate-related risks to the portfolio, this analysis also helps to inform an asset and portfolio management action plan that can be implemented immediately to begin to mitigate risks. Such actions include:

- Deployment strategies for temporary flood barriers (e.g., “Aqua Fence”)
- Relocating electrical equipment to higher elevations
- Building above code requirements
- Working with professional organizations and political institutions to effect change
- Reducing financial exposure to high-risk real estate markets

These actions not only have short-term benefits for specific properties, but they also can result in other positive downstream impacts, such as enhancing competitive positioning of properties among their peer set, diversifying portfolios, reducing insurance premiums, and most importantly, driving long-term value for investors. Importantly, although a given building may not be at immediate risk, the economic health of the entire community may be at risk, and thus, the commercial value of buildings is very likely to be impacted.

EXPANDING THE MODEL

The type of analysis shown here will only get more sophisticated, and by necessity, more common. As real estate investment managers field increasingly detailed questions and grapple with increasingly stringent ESG-related requirements from their clients, being able to quantify and measure exposure to risks like sea level rise will be critical. While the scope of this article has been on this one risk, the same can be said for other critical areas like measuring and tracking the energy efficiency and carbon intensity of properties as well as creating pathways for these real estate assets to reach net zero carbon by 2050.

Ultimately, the ability for managers to meet these increasingly sophisticated investment requirements will come down to the quality of their systems. The time to invest heavily in technologies and systems—to measure, store, and analyze environmental metrics that can help to assess, and ultimately mitigate such risks—is now.

ABOUT THE AUTHOR

Jerry Speltz is Head of US Real Estate Engineering for Barings Real Estate. Barings is a \$382+ billion global investment manager sourcing differentiated opportunities and building long-term portfolios across public and private fixed income, real estate, and specialist equity markets.

NOTES

* Barings Real Estate intentionally employs in-house engineers and insurance professionals, and further partners with specialty third-party consultants, to ensure appropriate attention to climate risk analysis.

¹ Intergovernmental Panel on Climate Change, “Climate Change 2021,” August 2021, https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf.

² Rebecca Lindsey, “Climate Change: Global Sea Level,” ClimateWatch Magazine, August 2020, <https://www.climate.gov/news-features/understanding-climate/climate-change-global-sea-level>.

³ Union of Concerned Scientists, “Underwater: Rising Seas, Chronic Floods, and the Implications for US Coastal Real Estate,” June 2018, <https://www.ucsusa.org/sites/default/files/attach/2018/06/underwater-analysis-full-report.pdf>

⁴ Anne Barnard, “The \$119 Billion Sea Wall that Could Defend New York...or Not,” New York Times, January 17, 2020, <https://www.nytimes.com/2020/01/17/nyregion/sea-wall-nyc.html>.

Although a given building may not be at immediate risk, the economic health of the entire community may be at risk, and thus, the commercial value of buildings is very likely to be impacted.

WHY DEBT, WHY NOW?



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Debt funds remain a comparatively small part of the real estate investment market, but they have been gaining in prominence in recent years.

Debt funds remain a comparatively small part of the real estate investment market, but they have been gaining in prominence in recent years. The share of debt funds in total capital raised globally by real estate investors has risen steadily, growing from 7% in 2016 to about 12% in 2020.¹ Funds investing in North America continue to lead the pack in the real estate debt world. Capital raised for debt funds shows the depth of the market in the US as compared with Europe. For non-US-based investors looking for exposure to commercial real estate (CRE) debt, the US market offers numerous attractions.

Broadly, the COVID-19 pandemic created an economic setback that led traditional sources of debt capital to retrench during the early stages of the pandemic, and while most have returned to nearly normal activity, there remain constraints on proceeds, as compared to pre-COVID.

CRE debt markets are also at different levels of maturity. Since 2008 the US has raised about 2.5 times more capital for debt funds compared to Europe.² As such, CRE debt presents an attractive proposition, at a time when returns from fixed income investments have been pushed to all-time lows. In the current low interest rate environment, the CRE lending sector should remain attractive on a relative basis given the decline in bond yields.

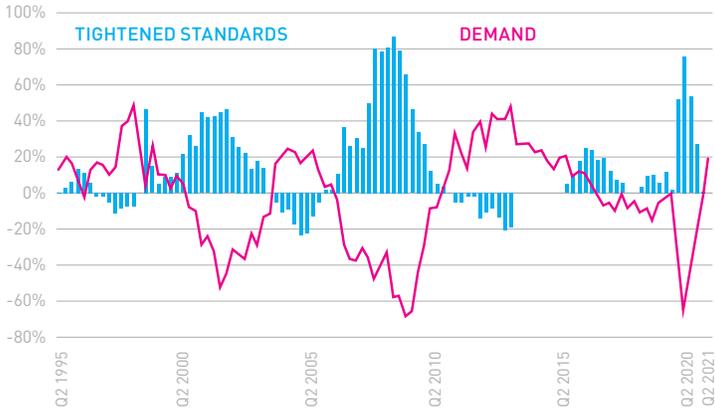
FUNDING GAP

CRE debt has long been considered attractive for its ability to combine stable income returns with a level of downside protection from real asset exposure. However, the lure has intensified as regulatory requirements have constrained traditional capital sources, creating opportunities for non-traditional lenders to fill the resulting gap.

- Recent economic uncertainty has exacerbated the capital gap that resulted from regulation during the last expansion, creating further opportunity for non-traditional lenders.
- Lending standards tightened dramatically in 2020 as banks responded to the uncertain economic outlook. As demonstrated by the Federal Reserve Senior Loan Officer Survey (*Exhibit 1*), the percentage of banks tightening lending standards reached levels not seen since the GFC. Lending standards have started to loosen in recent quarters but remain constrained.³
- Reduced appetite amongst traditional lenders for certain types of real estate lending—particularly transitional properties or assets which are typically higher risk—creates further opportunity for alternative lenders to respond to unmet demand.
- Nontraditional capital providers are well positioned to take advantage of this funding gap by originating and acquiring loans to produce attractive risk-adjusted returns, while potentially taking materially less risk due to having seniority in the capital stack in relation to the equity position.

EXHIBIT 1: STRICTER BANK LENDING STANDARDS

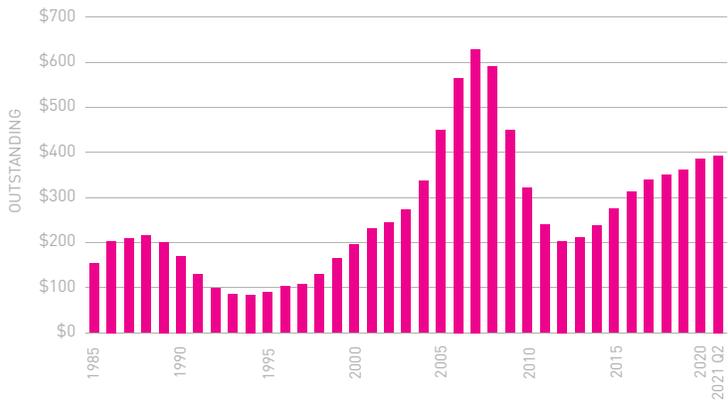
Source: Federal Reserve Senior Loan Officer Survey, USAA Real Estate Research



- Banks are the primary source of construction loan capital in the US, though bank construction loans outstanding remain 39% below pre-GFC levels, even though development activity is above 2007 levels (*Exhibit 2*).
- This demonstrates that for construction deals, the market is seeing a mix of more equity capital required and non-traditional lenders increasingly being relied upon to meet the borrowing needs of developers.

EXHIBIT 2: CAPITAL GAP—BANK CONSTRUCTION LOANS OUSTANDING (US\$ BILLIONS)

Source: FDIC; USAA Real Estate Research



US CRE DEBT IS A SIZEABLE MARKET

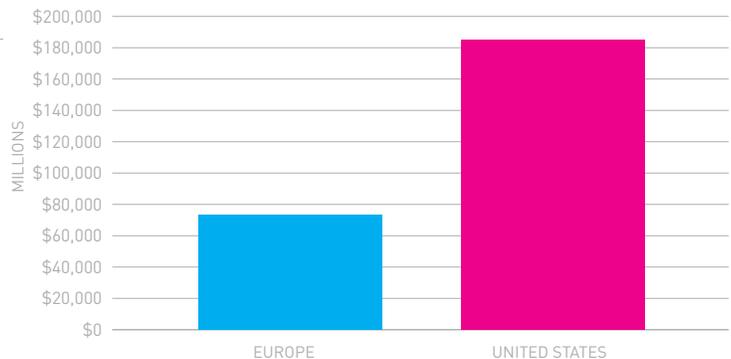
These market dynamics suggest an attractive investment environment for private debt. According to the 2021 ANREV/INREV/NCREIF Capital Raising Survey, non-listed debt products were the only type of vehicle for which the number that raised capital increased from 48 in 2019 to 76 in 2020, growing their share in the total number of vehicles from 5% to 11%.⁴

US CRE debt makes up a large market, with over US\$5.0 trillion in US mortgage debt outstanding as of Q2 2021, via traditional sources.⁵ The size of the market offers institutional investors depth, liquidity as well as potentially strong risk-adjusted returns. Capital raised for debt funds shows the depth of the market in the US, especially as compared with Europe. Since 2008, the US has raised about 2.5 times more capital for debt funds as compared to Europe (*Exhibit 3*). However, appetite for CRE debt vehicles amongst European-domiciled investors is growing. European investors account for 51% of the global capital raised for non-listed debt vehicles in 2020. This is a notable change compared to 2019 when European-domiciled investors accounted for only 13% of the capital raised for non-listed debt products.⁶

The CRE debt market in Europe continues to lag the strong growth in investor appetite. Outside the US, real estate finance continues to primarily be a bank-led market, although European non-bank lending activity has grown in recent years. Real estate debt funds remain comparatively new in Europe as the market is evolving, but vehicles have been gaining in momentum.

EXHIBIT 3: CAPITAL RAISE FOR CRE DEBT FUNDS, 2008-2021 (US\$ MILLIONS)

Source: IREL; USAA Real Estate Research



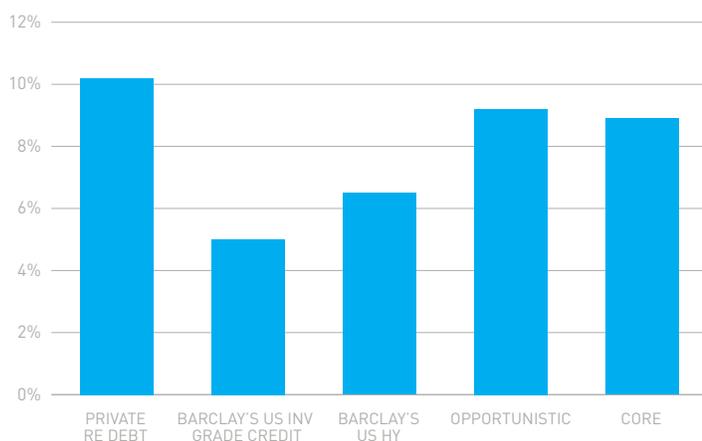
STRONG RELATIVE PERFORMANCE

Institutional investors have increased their appetites for CRE debt funds in recent years. The reasons for this are familiar; the hunt for yield and diversification arguments are well-known—though low volatility and strong relative performance have also played key roles. Expectations of traditional fixed income securities have been driven extremely low. Demand for yield has become more pronounced and the relative risk-reward profile of CRE debt has become even more compelling.

- CRE debt funds have outperformed investment-grade corporate bonds by 540 BPS annually, on average, over the past ten years, and outperformed high-yield corporate bonds by 370 BPS (*Exhibit 4*).⁷
- CRE debt fund total returns have also compared favorably to other real assets. Private equity real estate returns, as captured by Preqin. Have delivered returns of 9.3% and 8.9% for opportunistic and core strategies, compared to 10.4% for CRE debt funds over a ten-year period.⁸
- Looking at the available returns data for CRE debt funds across geographies, the relative outperformance of the US compared to Europe is also clear. Most vintages where we have data suggest North American debt funds have outperformed Europe across seven out of nine vintages.

EXHIBIT 4: TEN-YEAR RETURNS THROUGH Q1 2021

Source: Bloomberg US Corporate High Yield Bond Index (LF98TRUU:IND), Bloomberg US Aggregate Bond Index (LBUSTRUU:IND); Preqin Private Capital Benchmarks (note captured funds are global); USAA Real Estate Research



BEYOND THE CURRENT ENVIRONMENT

In the current environment, investors have become very selective, choosing certain asset classes over others and focusing on quality assets in terms of location, tenant covenants, and ESG criteria. US CRE debt has been increasingly sought after by pension funds and other institutional investors, and the arguments for including real estate in private-debt allocations appear to be strong.

Currently, there is an opportunity for institutional investors to fill the funding gap and capitalize on the robust demand in the commercial lending sector while providing investors with strong risk-adjusted returns. CRE debt strategies are attractive because they rival core equity strategies from a total return perspective and provide substantially more return than traditional fixed income in the current environment, while potentially taking materially less risk due to seniority in the capital stack in relation to the equity position.

As with most investment opportunities, real estate lending has a certain level of embedded risk. Even with such a strong CRE debt outlook, it is important to ensure sponsor alignment. It is critical to invest with a qualified and experienced investment manager that can navigate the risks and challenges within this sector.

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NOTES

This article represents the opinions and recommendations of the authors and are subject to change without notice. Past performance is no guarantee of future results.

¹ Asian Association for Investors in Non-Listed Real Estate Vehicles, European Association for Investors in Non-Listed Real Estate Vehicles, and National Council of Real Estate Investment Fiduciaries, Capital Raising Survey 2021, INREV, April 13, 2021, <https://www.inrev.org/research/capital-raising-survey>.

² IREI (website), Institutional Real Estate, Inc., <https://irei.com/>.

³ "Senior Loan Officer Opinion Survey on Bank Lending Practices," Federal Reserve, Accessed October 25, 2021, <https://www.federalreserve.gov/data/sloos/sloos-202004.htm>.

⁴ ANREV, INREV, and NCREIF, Capital Raising Survey 2021.

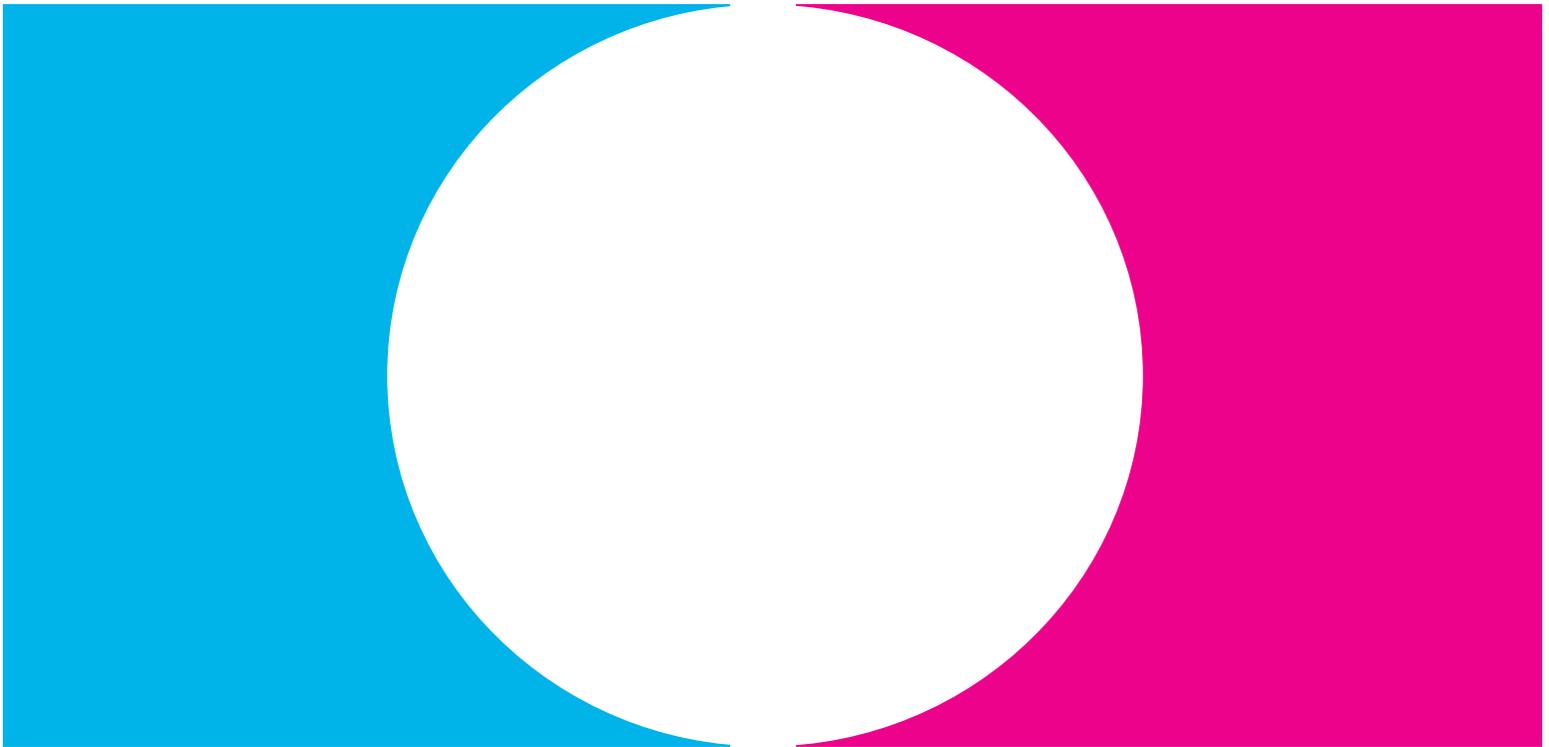
⁵ "Financial Accounts of the United States," Federal Reserve, September 23, 2021, <https://www.federalreserve.gov/releases/z1/>.

⁶ ANREV, INREV, and NCREIF, Capital Raising Survey 2021.

⁷ Preqin, Private Capital Performance Data Guide, Preqin, Accessed October 25, 2021, <https://docs.preqin.com/pro/Private-Capital-Performance-Guide.pdf>; Bloomberg and Barclays Indices, US Corporate High Yield Bond Index, Accessed October 25, 2021, <https://assets.bwbx.io/documents/users/iqjWHBFdfxIU/rSbjXhPAtpBl/v0>; Bloomberg and Barclays Indices, US Aggregate Bond Index, Bloomberg, September 30, 2021, https://www.ssga.com/library-content/products/factsheets/etfs/emea/factsheet-emea-en_gb-sybu-gy.pdf.

⁸ Preqin, Private Capital Performance Data Guide.

VALUING NET-ZERO



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With more tenants focusing on environmental targets, the burden to reduce direct emissions places increased pressure on investors, who are at a pivotal moment in ESG strategy.

Sustainability has become a mainstream issue within the commercial real estate sector and will become even more fundamental in the process of delivering office space as it moves up the occupier agenda. Globally, what are the trends in valuing net-zero and ESG strategies for the office sector?

With more tenants focusing on environmental targets, the burden to reduce direct emissions will intensify, placing increased pressure on real estate investors, who are now at a pivotal moment in defining their sustainable investment strategies.

The International Energy Agency's 2019 World Energy Statistics and Balances report shows that the built environment contributes 40% of carbon emissions worldwide. Evolving development legislation urging better sustainability and building practices for new and existing assets coupled with the rapid expansion of ESG criteria for commercial real estate investment will likely significantly impact the value of assets moving forward.

By 2030, many global corporations and ambitious governments aim to achieve their net-zero position. As for the commercial real estate sector, the vision is for all buildings (both new and existing) to be net-zero by 2050.

Investors will need to understand if a building can achieve a net-zero status, how to balance their portfolio, what the costs are to achieve this ambitious goal, and what impact it will have on their valuations. As occupational trends evolve and the future of work transforms, investors will also need to understand if their buildings are able to adapt to meet market demand.

According to a recent JLL survey of investors, sustainability and climate change are deemed to have the greatest impact on real estate performance, with two thirds stating that they would be increasing their allocations to more sustainable properties.¹

HOW TO VALUE SUSTAINABLE STRATEGIES

Valuers adopting Discounted Cash Flow (DCF) methodology can adapt assumptions that relate to income, exit yields, capital expenditures, voids, financing, and discount rates for all building types. Cash flows, which reflect the net income over the hold period, can illustrate how investment in sustainable buildings makes sense both ethically and financially.

INCOME

Rental income will be influenced by a limited supply of appropriately specified buildings and increased demand from tenants with ESG requirements. JLL research indicates that there is already an impact on several office markets, where the most sustainable specifications are resulting in premium rents, or discounts to prime rents are occurring where sustainability credentials are not in line with market expectations. The most significant risks to value exist where older buildings will soon not match up to changing occupier or legislative requirements, resulting in increased obsolescence. Therefore, when using forecasts that principally follow prime rents, there will be under-performing buildings, which will not track forecasted rental growth.

Based on JLL's research in Central London,² there is already a rental premium for BREEAM, a world-renowned sustainability rating scheme to assist the real estate industry to deliver sustainable buildings where the Outstanding- or Excellent-rated buildings tend to perform better than non-rated buildings. In fact, generally all buildings with a BREEAM rating of Very Good or higher achieve higher rents than those Grade-A buildings without a rating. The research shows that over the past three years, the average premium of all rated buildings above non-rated buildings is around eight percent. Similar rental premiums are also coming through internationally from the US and India (for LEED certified buildings) and Australia (for highly rated NABERS and Green Star buildings).

EXHIBIT 1: CENTRAL LONDON BREEAM RATED NEW GRADE A TRANSACTIONS RENTAL PREMIUM COMPARED TO ALL NEW GRADE A ACHIEVED RENTS

Source: JLL

	2011-2013	2014-2016	2017-2019
OUTSTANDING/EXCELLENT (441)	9%	11%	10%
VERY GOOD (303)	9%	5%	6%

It is worth noting that BREEAM and other green ratings are not the sole factor for low vacancy or increased rents. Tenants consider a wide range of factors when seeking new office space, including location, access to transportation, amenities, costs, and floorplates.

The enhanced sustainability of the building should mitigate the initial higher capital investment.

CAPITAL EXPENDITURE

When considering refurbishing or retrofitting older buildings, it may be financially advantageous and carbon efficient to upgrade existing buildings, both in terms of specification and plant and machinery, to create a more efficient building.

Investors also need to consider the potential risk of future taxation penalizing excessive carbon emissions or operational inefficiency within a building. In terms of cash flow, the question is whether to commit additional costs at the start of a retrofit project, or to take advantage of the short-term dearth of supply, or lower upfront costs with the anticipation of further significant refurbishments costs within the next ten years, to stay in line with legislation and market demand.

Estimates for additional capital expenditure vary and are dependent upon building type, design, and efficiency. Delivering a more sustainable building will, in most cases, cost more to build than a less sustainable office. However, if this results in higher demand from occupiers, higher rents, lower void rates, and savings in operational expenditures, then the enhanced sustainability of the building should mitigate the initial higher capital investment.

While variations in costs over time and the pace of legislative change are somewhat unknown, delaying action will mean losing out on the short-term supply-and-demand dynamics of the current market.

VOIDS

At the end of leases, tenants either renew or the space is remarketed. According to JLL research, well-specified spaces fitted out to meet both sustainable and wellness criteria lease up quicker than standard offices.

FINANCE

Geared returns can enhance performance through using debt to either acquire or fund the retrofit of a building. An increasing number of green loans are also being made available, which results in lower finance costs where sustainability-related key performance indicators (KPIs) are achieved, resulting in a lower cost of debt and enhanced returns.

DISCOUNT RATE

The discount rate applied to the cash flow reflects the risks associated with the achievement of a business plan in relation to the building over the hold period. Less sustainable buildings will inherently have a higher discount rate, as well as potential increased capital expenditure over time, taxation, longer voids, lower rents, and higher exit yields.

The associated risks will result in a higher pricing discount. By contrast, more sustainable buildings will prove less risky and bring lower discount rates.

EXIT YIELD

The exit yield adopted in a DCF reflects the quality of the building and the estimated average weighted unexpired term remaining on the lease at the time of the exit, which relates to a hold period normally reflected in the business plan or a standard assumption of either five or ten years. It also reflects the market's assessment of the long-term net income growth.

If a building does not track the leading market standards, then the exit yield will be higher, resulting in a lower value at the end of the hold period.

LOOKING FORWARD

As more tenants commit to environmental targets, the pressure to engage with the supply chain and reduce direct emissions will intensify, leading to increased pressure on real estate owners. This urgency to build what tenants are increasingly demanding will only accelerate.

Investor- and tenant-driven ESG requirements are expected to increase in all types of buildings, both new and refurbished. Supply and demand imbalances will potentially result in green premiums in the short-term for well-specified buildings, or brown discounts due to increased obsolescence. These fluctuations in supply, demand, cost, and legislation will occur over the next one to two hold periods for investors.

To achieve the best sustainability credentials and net-zero carbon specifications, costs are generally higher than for a standard refurbishment. However, given the speed at which legislation and ESG requirements are advancing, it is projected that within the next ten years, further capital expenditure will be required if net-zero compliance decisions are not made now.

Despite the increase in capital expenditure, the associated rental premiums, reduction in yield, and lower interest expenses should result in a more positive cash flow and an overall increase in returns for greener buildings.

As technology and construction techniques evolve, and as more sustainable buildings become less expensive to deliver, there may be a reduction in capital costs as new construction methods are adopted. Conversely, it is also likely that the costs of maintaining a less sustainable building will rise as fossil fuel prices increase, carbon taxes are introduced, and fines are levied for those not keeping up with legislative requirements.

Further, costs may be mitigated through the principle of the *circular economy*, with much more focus on recycling materials. Demolition costs may be significantly reduced as materials are resold for further use. In addition, building design will result in more flexible buildings so that these assets can be refurbished more economically and adapted to alternative uses.

THE CIRCULAR ECONOMY

“Put simply, the circular economy is an economy where we create more value with fewer resources. A circular economy is based on three principles, as stated by Ellen MacArthur Foundation, the global leader in circular thinking:

- Design out waste and pollution
- Keep products and materials in use
- Regenerate natural systems

As opposed to a linear economy where we extract materials, use them, then dump them, the circular economy seeks to “close the loop” by reusing, repurposing, remanufacturing, or recycling materials.

For instance, it might mean designing a building so it can be easily adapted to different uses, constructing a building in a way that it can be dismantled without damaging the materials, or fitting out a property using repurposed or recycled furniture. It also means maximising the current value of assets by using them to their full capacity, for example, by using empty office space for events outside of business hours.”

Emerging trends indicate that there may also be short-term premiums for net-zero buildings. While the low-carbon premium in rents and capital values may dissipate over time, buildings that have not had meaningful upgrades towards net-zero carbon will experience increased obsolescence.

As sustainability performance becomes clearer and more defined, it is likely that premiums will disappear. Buildings that don't comply will underperform. Buildings that are not designed to be net-zero carbon will require costly retrofits in the future, which will likely result in the displacement of tenants and lost rent.

ABOUT THE AUTHORS

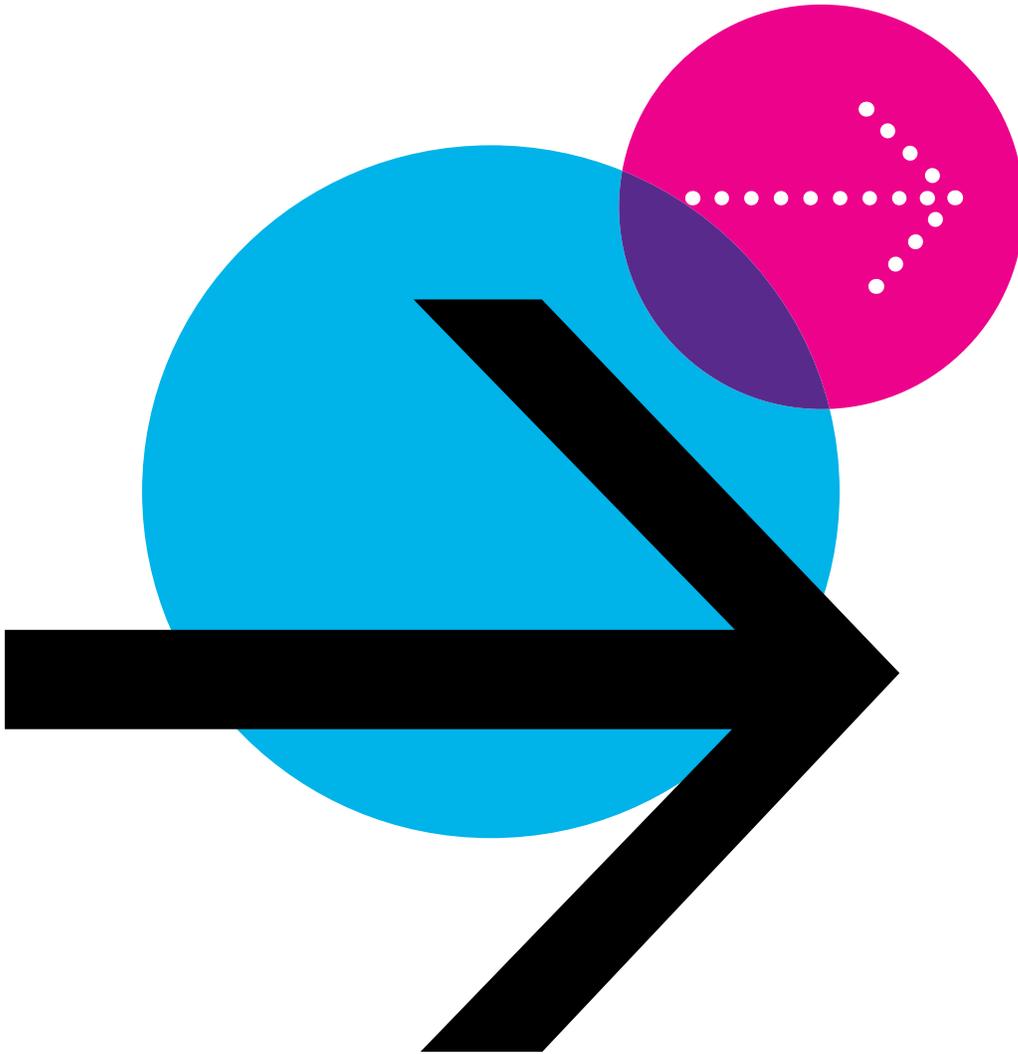
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¹ JLL, “Decarbonizing the Built Environment,” June 20, 2021, <https://www.jll.co.uk/en/trends-and-insights/research/global/responsible-real-estate>.

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MIGRATION IN REAL TIME



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As the public health situation started to improve in early 2021 and the economy re-opened, did migration flows change too—and what if we are able to answer this in real time?

Migration was a key differentiator in the US housing market performance through 2020 and into 2021, both across and within markets. As the pandemic spread, people moved from more densely populated and more expensive gateway metro areas to more affordable ones, as well as from cities to suburbs. Residential demand responded quickly to the changing patterns and 2020 ended with an unusually wide variation in rent growth and home price appreciation around the country.

As the public health situation started to improve in early 2021 and the economy re-opened, did migration flows change too? Are migration patterns responding to the recent increases in the Delta variant infections?

The following analysis, which is based on mobile phone data, sheds light on these questions and provides early evidence that, for the most part, population losses or gains (depending on location) directly triggered by the pandemic are likely temporary. We also find that mobile phone data can be a good predictor of near-term domestic net migration in general, and therefore a key alternative source relative to the official estimates that are provided by the US Census Bureau, which has at least a one-year lag.

These new data allow us to track domestic migration flows in real time, and also offers a few important additional advantages, including the ability to conduct analysis at the most granular levels of geography, as well as by various demographic characteristics, such as household income or age.

DATA VALIDATION

Using mobile phone data to track migration is still an emerging area of research. There is no shortage of firms that now offer a wide range of products and services based on such data to help their customers answer all kinds of questions that have to do with locational attributes. Not surprisingly, it is a particularly hot topic in proptech that is transforming real estate, including how firms search for and analyze potential opportunities for investment and development.

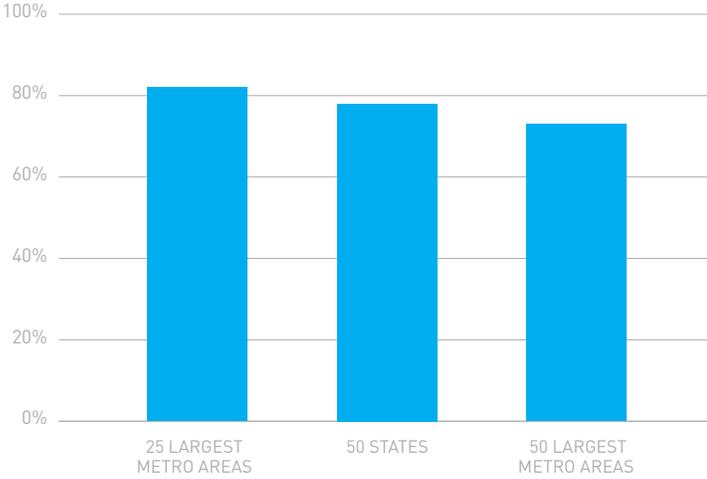
While it makes sense that technology would make it possible to track people's daily mobility through their mobile phone usage, we could not find any published studies or articles on how accurately this can be done—at least relative to publicly verifiable US sources. This prompted us to do our own analysis and the results turned out to be quite encouraging.

One of the first steps in the analysis was to compare our implied domestic migration estimates based on mobile phone data to the actual domestic migration estimates provided by the US Census Bureau across states, metro areas, counties, and cities.¹

Once we confirmed that the two sets of estimates are highly correlated across various geographies, the next step was to determine whether our estimates of domestic migration in the current year could also be reliably used as a predictor of the official domestic migration figures reported by the census in the following year. We found that they could, especially in more populous parts of the country where large mobile phone data sets provide more representative samples (*Exhibit 1*). Of course, it helps that domestic migration patterns change gradually from year to year, but it was important to prove that the new alternative source of high-frequency (monthly) data can be used as an accurate leading indicator for the main driver of population growth across markets.

EXHIBIT 1: % SHARE OF VARIATION IN REPORTED DOMESTIC MIGRATION RATES (EXPLAINED BY MOBILE PHONE-IMPLIED ESTIMATES)

Sources: Bureau of the Census; StratoDem Analytics – An Altus Group Company; Berkshire Research



The pandemic did not materially affect domestic migration trends for many major cities.

DOMESTIC MIGRATION DURING THE PANDEMIC

Once the data was validated, we were much more confident answering two key questions that arose in 2020 as the pandemic started regarding major impacts on domestic migration trends:

- 1) Are people moving out of the more expensive and more densely populated metro areas—especially coastal and gateway markets—and, if so, are they moving out at greater rates than in the prior year?
- 2) Are people moving out of major cities into suburbs more than they did in the prior year, or are they leaving for other metro areas?

Our initial findings, which are now also supported by the recently released census estimates, have suggested that the pandemic did exacerbate domestic migration trends across markets that were in place for some time. As *Exhibit 2* shows, domestic migration has indeed improved or kept pace in most metro areas or divisions where it was already strong before the pandemic, but it has worsened on the opposite side of the spectrum.

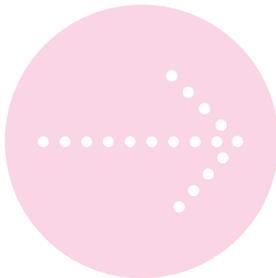


EXHIBIT 2: TOP AND BOTTOM METRO AREAS FOR DOMESTIC MIGRATION IN 2020

Sources: Bureau of the Census; StratoDem Analytics – An Altus Group Company; Berkshire Research

TOP 10			BOTTOM 10		
	2019	2020		2019	2020
AUSTIN	1.9	2.1	PHILADELPHIA	-0.6	-0.7
PHOENIX	1.5	1.6	NEWARK	-0.6	-0.7
JACKSONVILLE	1.3	1.3	OAKLAND	-0.5	-0.8
RALEIGH	1.3	1.3	DETROIT	-0.7	-0.8
TAMPA	1.1	1.3	CHICAGO	-0.9	-1.0
LAS VEGAS	1.4	1.2	LOS ANGELES	-1.0	-1.1
CHARLOTTE	1.0	1.1	MIAMI	-1.7	-1.5
SAN ANTONIO	0.8	1.0	SAN JOSE	-1.4	-1.5
NASHVILLE	0.8	0.9	NEW YORK	-1.4	-1.6
DALLAS	0.7	0.8	SAN FRANCISCO	-0.9	-1.6
AVERAGE	1.2	1.3	AVERAGE	-1.0	-1.1

In the case of the domestic trends within markets, the picture was more nuanced. The data show, for example, that the pandemic did not materially affect domestic migration trends for many major cities. In fact, urban population flows have even improved relative to the prior year in places such as Austin, Denver, Houston, Phoenix, Raleigh, San Antonio, Seattle, and Tampa. At the same time, the pandemic has reinforced migration out of the large and densely populated major cities in gateway markets, including New York, Los Angeles, Chicago, Boston, and San Francisco.

Our preliminary analysis suggests that most of the people who left those cities last year moved into neighboring suburbs. Despite the influx of new dwellers, suburbs still have experienced net out-migration at about the same rates as before the pandemic. In other words, both cities and suburbs experienced net population move-outs into other markets—usually in other states. Texas, Florida, Tennessee, Arizona, and Nevada were among the major beneficiaries of these trends.

The new data allows us to look at the population flows even more closely and to have a fuller picture of how migration trends varied within cities or suburbs, as well as in terms of demographic profile of the movers. For example, *Exhibit 3* shows that while the San Francisco metro area lost population last year, some neighborhoods in the area added hundreds of new residents. Meanwhile, some of the highest migration flows into Phoenix took place in large,

rapidly expanding master-planned communities west of the city, such as Tartesso and Verrado.

It was also instructive to find out that a typical migrant from San Francisco to Phoenix was 39 years old with a household income of approximately \$150,000, while those moving from Phoenix to San Francisco were 37 years old with a much lower household income of \$88,000.

A typical migrant from San Francisco to Phoenix was 39 years old with a household income of approximately \$150,000.

EXHIBIT 3: ESTIMATED NET MIGRATION FROM MARCH 2020 THROUGH APRIL 2021; SAN FRANCISCO, CA

Sources: Unacast, StratoDem Analytics – An Altus Group Company, Berkshire Research

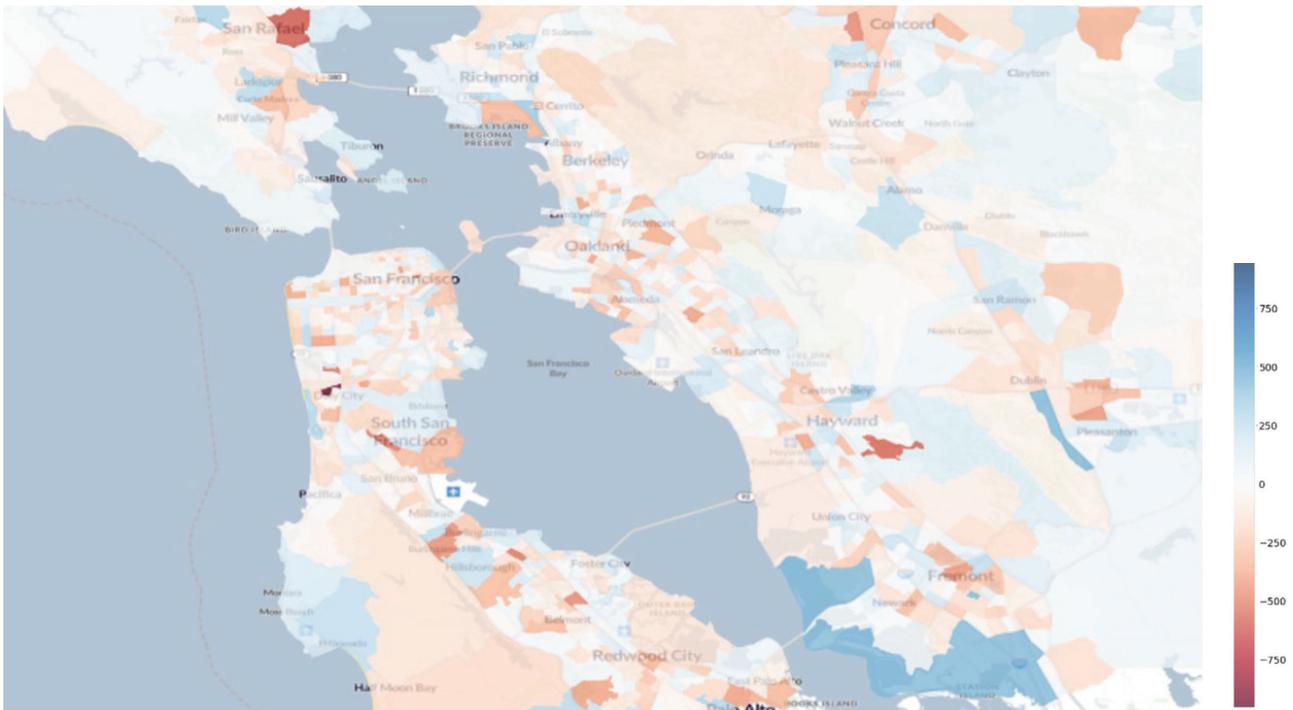
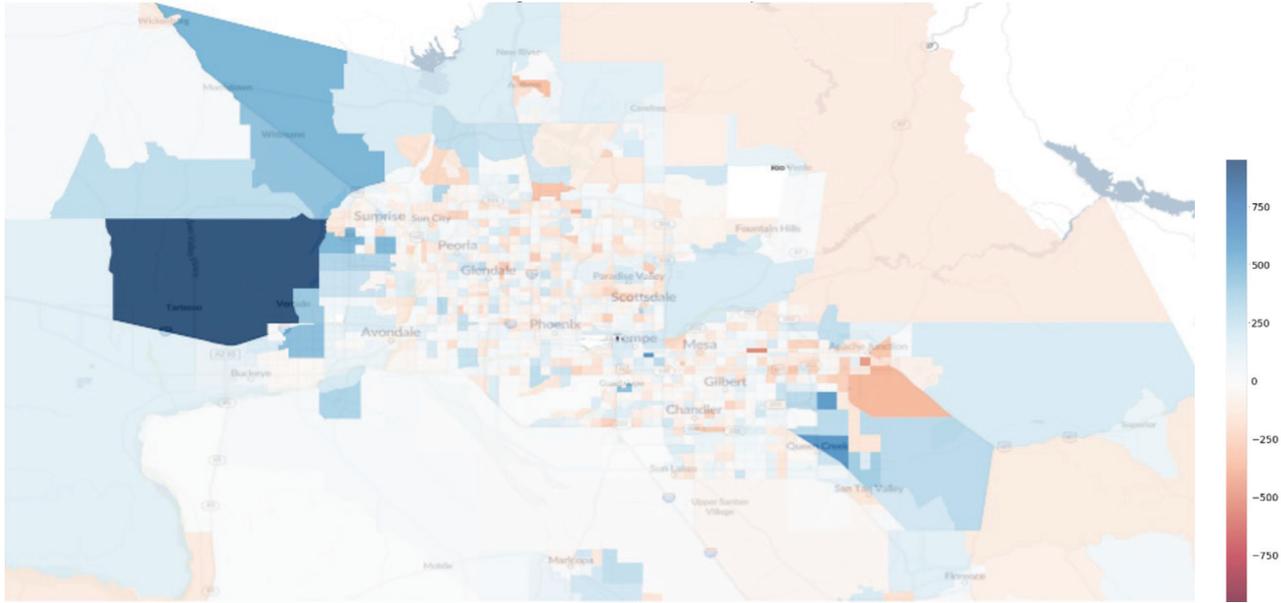


EXHIBIT 4: ESTIMATED NET MIGRATION FROM MARCH 2020 THROUGH APRIL 2021; PHOENIX, AZ

Sources: Unacast, StratoDem Analytics – An Altus Group Company, Berkshire Research

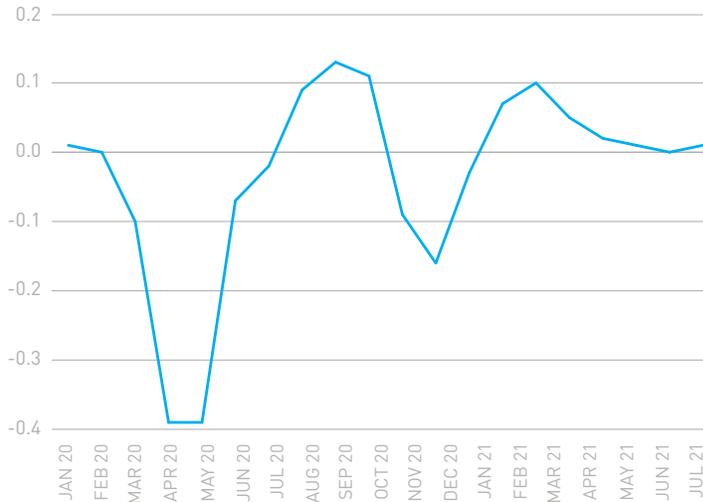


LOOKING AHEAD

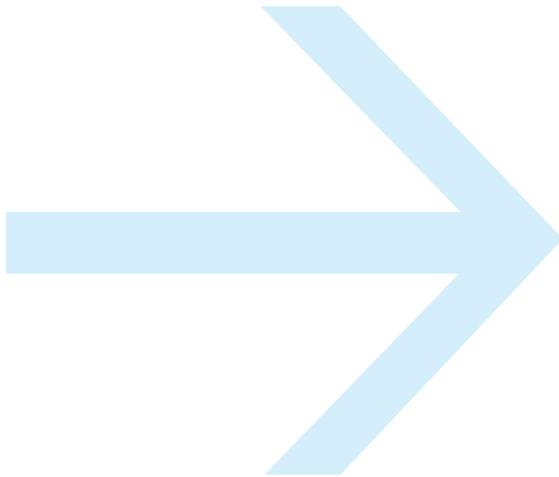
As the public health situation improves, most of the population losses or gains directly linked to the pandemic are likely to be temporary, depending on the location. To illustrate this, *Exhibit 5* shows estimated implied rates of migration into and out of urban neighborhoods in gateway markets that experienced tangible negative migration flows last year, measured using monthly mobile phone data.

EXHIBIT 5: ESTIMATE NET URBAN MIGRATION RATE (%)

Sources: Bureau of the Census; StratoDem Analytics – An Altus Group Company; Berkshire Research



Mobile phone data is a powerful alternative source for evaluating domestic migration across and within markets.



In these cities, population flows were closely tied to the two waves of new infections in the spring and winter. As the waves of infections subsided, migration flows quickly turned positive, suggesting that the pandemic-related move-outs would partially reverse as the economy re-opens, depending on how flexible businesses would be regarding work-from-home arrangements with their employees. At the same time, the data also show that urban migration has slowed, or in some cities, went negative again as the Delta variant caused more aberrations.

The pandemic is still only part of the story. These cities (and in most cases, their suburbs as well) were already experiencing negative domestic migration before 2020, and it will take time for those trends to stabilize or turn around. It is certainly encouraging for many investors to see that people have come back into urban areas, but the real recovery will only start when domestic migration exceeds pre-pandemic rates—which has yet to take place.

DOING MORE WITH REAL-TIME DATA

Mobile phone data is a powerful alternative source for evaluating domestic migration across and within markets. It allows us to track it with high frequency and granularity, including stratification by age and income, and can also be used to predict near-term population flows and potentially other demographic trends.

As with any new data source, further research will be needed to better understand the full range of its potential applications, but it is already proving to be quite effective in explaining variations in regional growth patterns, as well as the factors that might be driving them.

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NOTES

This material is for informational purposes only and is not intended to, and does not constitute financial advice, investment management services, an offer of financial products or to enter into any contract or investment agreement.

¹ StratoDem Analytics integrates raw mobile phone data provided by Unacast with StratoDem economic and demographic nowcasting and forecasting to measure aggregate migration rates at the neighborhood level by household characteristics.

FAMILY OFFICES AND ESG



By Kate Pennartz
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As sustainable investing continues to grow in popularity, family offices have taken note—and understanding ESG targets and regulations will be key for long-term performance.

As sustainable investing continues to grow in popularity, family offices have taken note. Investor surveys indicate that more and more respondents take the non-financial performance of a company into consideration in their investments, which include environmental, social and governance (ESG) strategies. Of the most important ESG criteria to investors, green building certification ranked as the top.¹

In addition to the voluntary green certifications available to companies, a number of regulatory entities have enacted or are in the process of enacting green build requirements. Here, we examine the background and future of green certifications and green build requirements, along with how such certifications and other ESG criteria can be factored into real estate investments.

US REGULATORY FRAMEWORK

Green certifications can serve to signify a building's environmental friendliness and stewardship. In the 1990s, the Building Research Establishment's Environmental Assessment Method (BREEAM) rating system was established, which utilizes third-party certification to assess an asset's ESG performance.² This system was established in the UK but is recognized internationally for its ability to assess the environmental performance of both new and existing properties.

With respect to green building within the US, the US Green Building Council (USGBC) was established in 1993. By the late 1990s, USGBC had established its first version of a green building rating system for green building design, construction, and operation, which is known as Leadership in Energy and Environmental Design (LEED).³ The last few decades have seen an increase in green building certification popularity.

Over time, hundreds of different green certifications have been established. However, it is important to choose a legitimate, widely accepted and tailored green certification. Facilities seeking green certification should generally consider programs that are third-party certified, which means that an independent party with no interest or financial ties to the project has made the determination.

Furthermore, green certification programs that are most widely accepted include some type of ongoing verification of certification compliance. For example, LEED recertification allows a project previously certified under LEED to submit twelve months of data and receive recertification valid for three years. By encouraging recertification, these programs ensure that real estate continues to demonstrate environmental and energy sustainability over time. Notably, a decision on which green certification(s) to seek may largely be driven by which types of certifications investors deem important.

One reason that the role of certification is often undertaken by third-party programs is that no centralized governmental agency in the US is tasked with determining green certification. Some states have established their own recognition programs for implementation of environmentally friendly and pollution-reducing activities. For example, the Ohio Environmental Protection Agency (Ohio EPA) has established its “Encouraging Environmental Excellence (E3) Program,” which recognizes Ohio businesses for their environmental stewardship.⁴ Under this program, businesses submit an application providing information on a number of criteria, including sustainable materials and purchasing, pollution prevention, energy efficiency, green building, and renewable energy.

Outside of these voluntary green certification programs, several states have established or are in the process of establishing green building requirements. For example, California passed Senate Bill 32, which requires statewide greenhouse gas (GHG) emissions to reach a level 40% below 1990 levels by 2030.⁵ California legislators and regulators believe that an important component of lowering GHG emissions is through building decarbonization. As a result, the California Air Resources Board (CARB) is focusing on advancing “zero emission buildings,” which includes statewide strategies for building standards codes, as well as encouraging a voluntary effort to go beyond mandatory code requirements.

Similarly, the New York City Council passed legislation, known as the Climate Mobilization Act, to reduce GHGs and improve energy efficiency for New York City buildings.⁶ In part, the legislation establishes emissions caps for buildings over 25,000 SF and roofs of smaller, new residential and non-residential buildings will be equipped with a solar photovoltaic system or a green roof.

As the regulatory scheme for green building continues to evolve, interested persons need to be aware of potential areas for risk and liability. For example, green building requirements may change over time and in some instances, may become mandatory. A change in the degree of regulation may impact a business both economically and legally.

With respect to the more voluntary programs for certification, such as LEED, interested parties need to ensure that they maintain such certification and do not advertise such certification without ensuring consistent and continued compliance. As green regulations become more common, there is also a risk that these regulatory programs will contradict or be inconsistent with those more voluntary programs. Due to the evolving nature of green standards, businesses should continue to assess the economic, regulatory, and legal risks associated with green certification and green building.

Due to the evolving nature of green standards, businesses should continue to assess the economic, regulatory, and legal risks associated with green certification and green building.



CONSIDERATIONS FOR OWNERS OF REAL ESTATE

Owners of real estate assets can incorporate ESG in a property's design and operation by obtaining green certifications. Not only can such certifications reduce maintenance costs for owners, but certifications also attract certain prospective tenants and buyers who want to factor ESG into their investments.

In addition to certifications, ESG criteria can be tracked during the period of ownership of property by the selection of third-party property managers who will monitor the property in accordance with such criteria, whether by agreeing to minimum monitoring standards or via incentive fees to reward meeting set ESG targets. In addition to demonstrating that a property is well managed, identifying and tracking ESG during the period of ownership limits unforeseen risk at the time of disposition of the property that could affect purchase prices. It follows, then, that attention to sustainability efforts could increase property values long-term.⁷

Aside from incentivizing the development of eco-friendly buildings, the impact of ESG investing in the real estate industry could even extend to rethinking the way that communities are developed. Affordable housing and environmentally sustainable, well-connected neighborhoods have proven to deliver impressive returns to investors, and indicate the potential for a new, and profitable, approach to urban development.⁸

Additionally, real estate owners can incorporate ESG concepts into individual tenant lease agreements in various ways. For instance, owners can require that tenants cooperate with the owner/landlord in obtaining and maintaining compliance with the owner's green certifications, and, increasingly, laws regarding carbon neutrality for buildings. The owner/landlord may require that tenants participate in a recycling program or have each tenants' utilities sub-metered to monitor usage. Leases may even contain use restrictions that range from prohibiting gas stations in retail shopping center developments to requiring office tenants to use only "clean" dry-cleaning services.

Incorporating ESG into leases can be a win-win to both landlords and tenants, as landlords can pass through capital expenditure costs on ESG projects or green certifications to tenants, while tenants can receive the benefit of the cost-savings on their utility or operating expense payments.

Increased state and local programs encouraging and/or requiring green building requirements indicate the growing importance of green building to owners of real estate assets. As real estate owners, buyers, and tenants continue to consider a building's environmental stewardship and sustainability efforts, green certification, in addition to other ESG criteria, will be at the forefront of investment decisions.

Affordable housing and environmentally sustainable, well-connected neighborhoods have proven to deliver impressive returns to investors

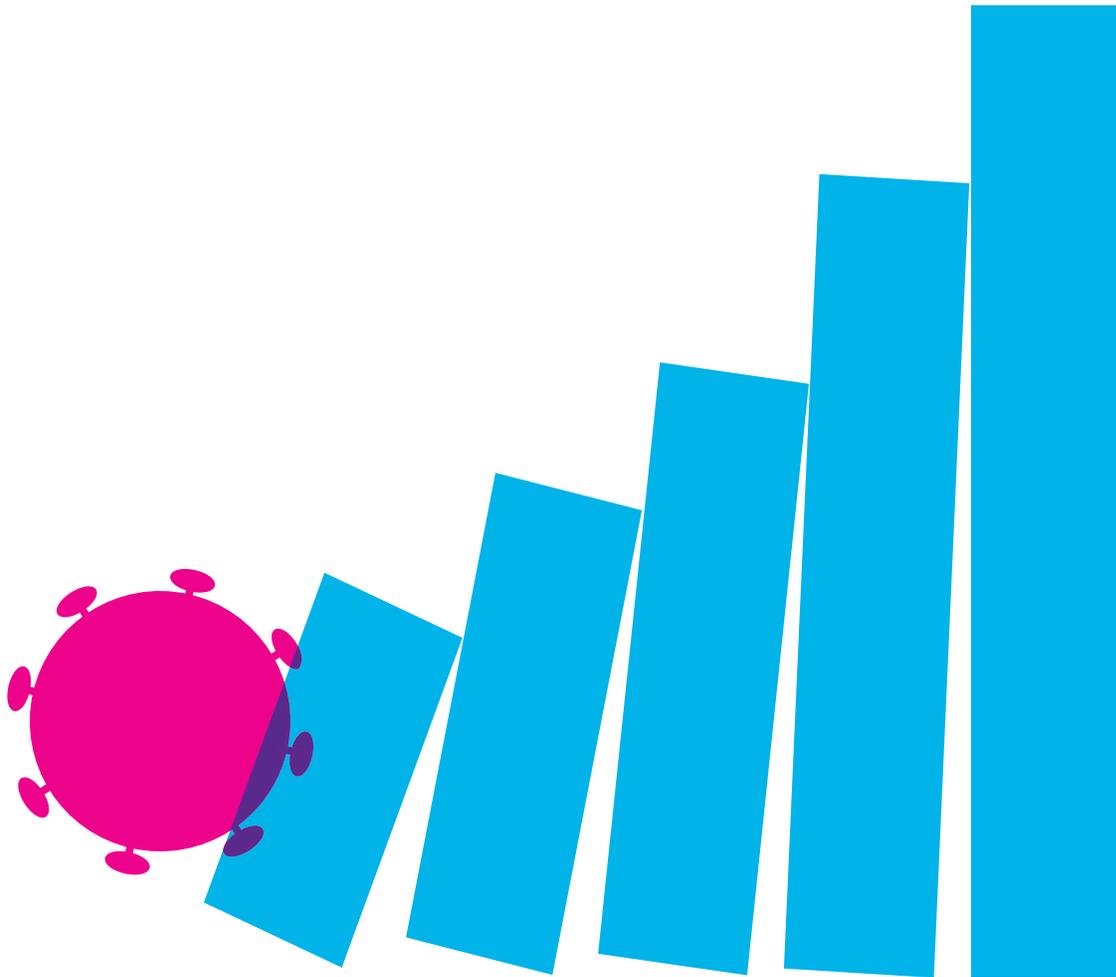
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- ¹ Wealth Management Real Estate, "10 Takeaways from AFIRE's 2021 International Investor Survey," [WealthManagement.com](https://www.wealthmanagement.com/investment-strategies/10-takeaways-afire-s-2021-international-investor-survey), last modified May 04, 2021, <https://www.wealthmanagement.com/investment-strategies/10-takeaways-afire-s-2021-international-investor-survey>
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- ⁸ Steven Desmyter, "What if ESG Could Solve the Global Housing Crisis?" Forbes, last modified May 25, 2021, <https://www.forbes.com/sites/stevendesmyter/2021/05/25/what-if-esg-could-solve-the-global-housing-crisis/?sh=3e2ca18e1201>.

DOWNTOWN DISRUPTION



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The pandemic-driven changes to downtown areas and central business districts are changing the geography of institutional investment. What else changes because of this?

As the US continues to muddle through the COVID-19 pandemic, downtowns and central business districts (CBDs) have emerged as the urban and metropolitan geographies most vulnerable to structural changes in where and how Americans work.

By all accounts, the rise of remote work and the broadening of the term “flexible work” appear to be permanent rather than temporary phenomena; structural rather than cyclical. It is now commonplace to acknowledge that the loss of office workers—and prospect of empty office buildings—threatens the long-term fiscal health of many cities, the small businesses that depend on office workers, and the vitality of America’s downtowns.

The “evidence” from a pandemic still underway paints a disruptive future. The McKinsey Global Institute’s “Future of Work After COVID-19” report estimates that 20–25% of the workforce could work remotely in the future.¹ A plethora of media articles and business surveys report how companies large and small are embracing hybrid work models, enabling their employees to work remotely part of the time. A recent article from the New York Times—“Why the Empire State Building, and New York, May Never Be the Same”²—is the common meme for business and general media alike; just change the moniker of the building and the name of the city and you get the emerging conventional wisdom.

As institutional investors struggle to make sense of these shifting dynamics, it is best to look beyond the simplicity of shock headlines and re-discover the complexities that define America’s downtowns as well as other urban and suburban districts which increasingly combine a mix of uses including work, residential, education, research, commercialization, entertainment, waterfront or other amenities, and distinctive retail and restaurant choices—uses typically associated with downtown areas.

Such an inquiry forces investors to look at the distinctive market realities that define individual US downtowns rather than group all downtowns (particularly those located in a small subset of cities) in one narrowly drawn asset class. The end result may be that the pandemic may compel an expansion of institutional investment to a broader set of uses and geographies in a broader set of cities.

DOWNTOWNS ARE NOT UNIFORM

Despite a common label, America's downtowns are an intensely varied group of similarly situated districts. As the New York Times recently reported, the share of downtowns that is occupied by office uses varies from 83% in Boston, 74% in San Francisco, and 72% in Washington, DC to 30% in Nashville, 25% in St. Petersburg, and 19% in San Diego.³ Most downtowns in the country have undergone a dramatic transformation over the past sixty years; first, radical decline as populations suburbanized and employment decentralized, then, rebound and revival fueled by shifting location preferences, changing cultural dynamics, and declining crime. As Emily Badger and Quoc Trung Bui recently wrote:

“Downtowns, like investment portfolios, are more sustainable when they are diverse. [. . .] CoStar data going back to 2006 shows that many big-city downtowns have been evolving away from strictly office space, adding college dorms, apartment buildings, and civic attractions. Cities where ‘downtown’ has increasingly come to mean more than offices are likely to be more resilient as they emerge from the pandemic, researchers and downtown officials say.”⁴

Targeted public, philanthropic, corporate, and university investment has also played an enormous role in the transformation of downtowns over the decades. Dan Gilbert's decision to move Quicken Loans (and his family of companies) to the core of downtown Detroit in 2007 started a revival that continues to this day. Duke University is widely credited with acting as the stimulus for the rebirth of downtown Durham; the same can be said of Arizona State University in downtown Phoenix. Similar moves by local investors can be found in downtowns as disparate as Cincinnati, Cleveland, Erie, St. Louis, and Tampa.⁵



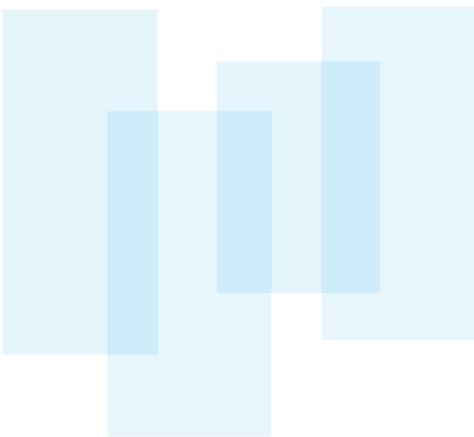
Electric Works, Fort Wayne, Indiana

THE RISE OF INNOVATION DISTRICTS

Downtowns are not the only geography of employment density in cities and metropolitan areas. Over the past twenty years, innovation districts have organically emerged near advanced research institutions and health care centers. The Brookings Institution defines these districts as

“Geographic areas where leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators, and accelerators. They are also physically compact, transit-accessible, technically wired, and offer mixed-use housing, office, and retail.”⁶

These districts reflect the innovation economy’s demand for co-location, proximity, and density so that companies, researchers, and entrepreneurs can share ideas rather than invent in isolation. It is doubtful that the pandemic has disrupted the innovation dividend associated with such co-location. The most advanced districts are in midtown areas such as Midtown Atlanta (near Georgia Tech), University City in Philadelphia (near Drexel University and the University of Pennsylvania), and Cortex in St. Louis (a collaboration of Barnes Jewish Hospital, St. Louis University, and Washington University). However, the un-anchoring of anchor institutions such as Duke University and Arizona State University, described above, shows that “traditional” downtowns have the potential to evolve as innovation districts.



FEDERAL POLICY MATTERS

Downtowns have the potential to harness unprecedented federal investments to mitigate the damage from the pandemic and accelerate the transition to a multi-use future. The federal government is engaged in a multi-act, multi-dimensional effort to spur an equitable economic recovery. The US\$1.9 trillion American Rescue Plan enacted in March 2021, for example, provides flexible funds to states, cities, and counties (as well as resources via the Department of Treasury, Small Business Administration, and Economic Development Administration) that can be used to rebuild downtown economies and promote business and neighborhood equity.

Other moving or proposed legislative vehicles go even further. The US\$250 billion Innovation and Competition Act, passed with bipartisan votes by the US Senate, would provide resources to expand basic and applied research, STEM education, and technology hubs. A US\$1 trillion+ infrastructure bill, also passed with bipartisan support by the US Senate, recommends unprecedented investments in a broad array of infrastructure assets including: transportation (e.g., roads and bridges, public transit, passenger and freight railways, airports, waterways, and ports), buildings and utilities (e.g., affordable housing, high speed broadband, electric grid, public schools), and disaster resilience.

These investments are on top of existing federal programs, such as Historic Preservation Tax Credits, Low Income Housing Tax Credits, New Market Tax Credits, and Opportunity Zones, which have historically been used to diversify uses within downtowns.

As federal legislation proceeds, there are even efforts to focus federal investments directly on downtown disruption. In an effort to revitalize downtown business and urban districts, Senators Debbie Stabenow (D-MI) and Gary Peters (D-MI), along with Representatives Jimmy Gomez (D-CA), Dan Kildee (D-MI), and John Larson (D-CT) have introduced the Revitalizing Downtowns Act. Modeled after the Historic Tax Credit, the Revitalizing Downtowns Act would provide a credit equal to 20% of the Qualified Conversion Expenses in converting obsolete office buildings into residential, institutional, hotel, or mixed-use properties. An obsolete office structure is defined as a building that is at least twenty-five years old, and the bill requires 20% of the units in a residential conversion to be dedicated to affordable housing.

STATE AND LOCAL POLICY MATTERS

Beyond federal investments, states and municipalities also have a role to play through incentive programs such as TIF districts, tax abatements, and PILOT programs, all of which can be utilized to help downtowns and other urban districts rebound from pandemic disruption. Many states and localities, in particular, have specific programs to assist with adaptive reuse of historic structures. For example, North Carolina's Mill Credit program made it feasible to redevelop 1.2 million SF of former R.J. Reynolds Tobacco factory buildings in Winston-Salem, thereby preserving these beautiful buildings while providing a unique sense of place for the Innovation Quarter. Similar programs have been successfully employed in Durham, NC; Providence, RI; Pittsburgh, PA; and Cleveland, OH.

WHAT THIS ALL MEANS

The COVID-19 pandemic could have major implications for institutional investments in downtowns and CBDs. Pre-crisis, these investments tended to be over-concentrated in a narrow group of asset classes in a small subset of US cities.

Post-crisis market dynamics should place a premium on downtowns and other parts of cities that have a broader mix of uses and activities, including innovation-oriented co-location of research institutions, mature companies, and start-ups and scale ups. In doing so, investors would be wise to examine the "good bones" of downtowns in secondary and tertiary cities that have not been the traditional focus of institutional investment. Investors should also track the flow of federal investments that are likely to leverage the distinctive competitive assets and advantages of these places. This will require a commitment to robust market analysis that captures the full growth potential of a broad, geographically diverse set of CBDs, and effectively reimagine the future of "downtown."



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Bruce Katz is the Founding Director of the Nowak Metro Finance Lab at Drexel University. Frances Kern Mennone is Managing Director for FBT Project Finance Advisors, a registered municipal advisor.

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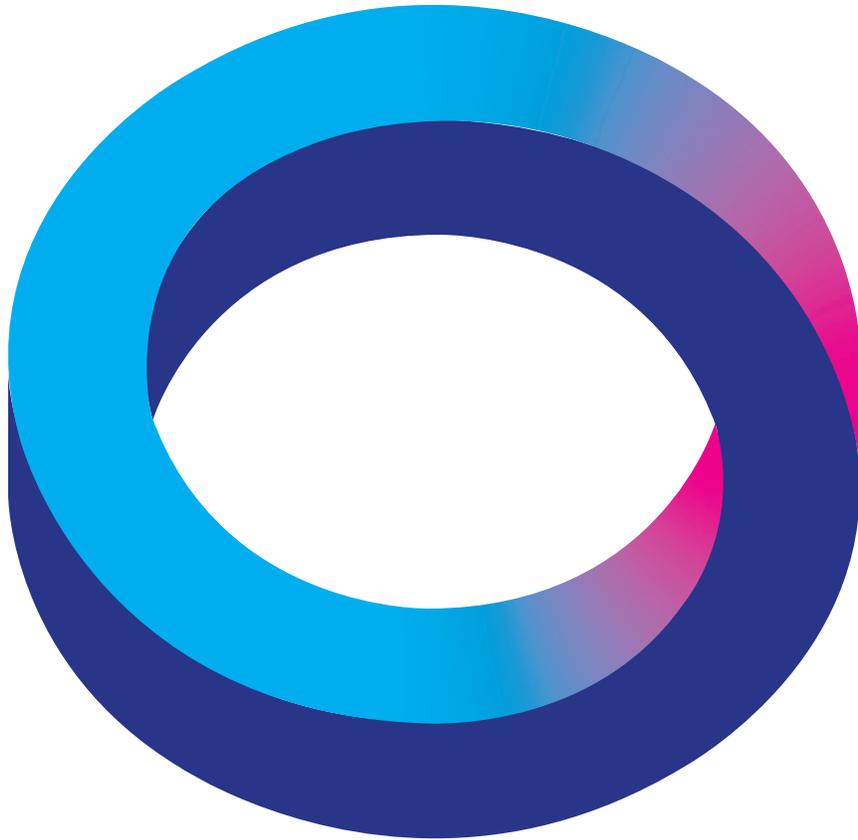
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Post-crisis market dynamics should place a premium on downtowns and other parts of cities that have a broader mix of uses and activities, including innovation-oriented co-location of research institutions, mature companies, and start-ups and scale-ups.

CHOOSING FLEXIBILITY



By Tal Peri
Head of US East Coast and Latin America
Union Investment Real Estate, New York

Employees are increasingly demanding flexibility and choice for where (and when) they work. What strategies can landlords implement to adapt?

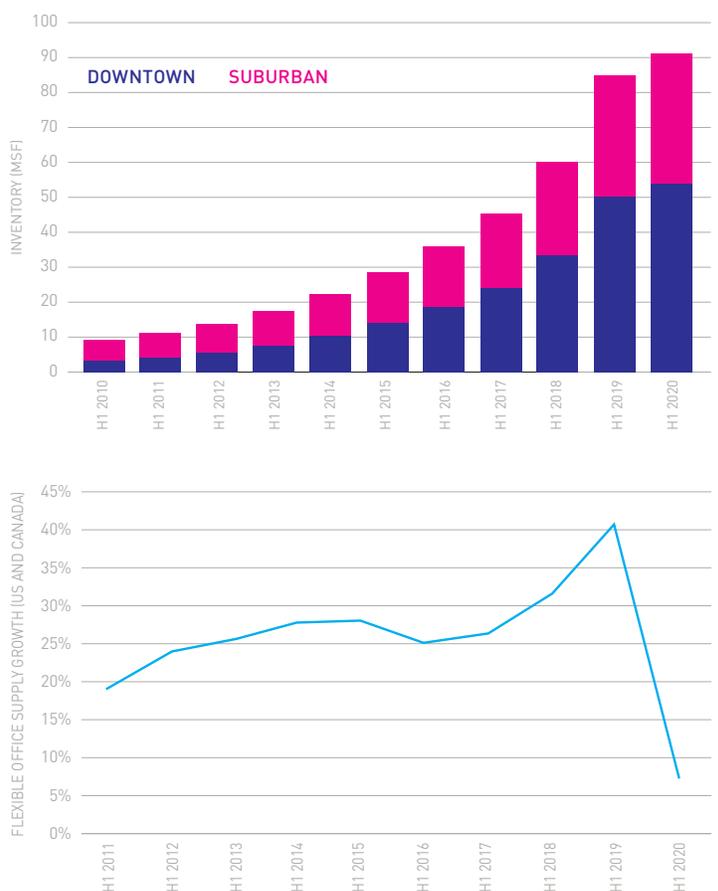
In the early months of the COVID-19 pandemic, the negative sentiment regarding the prospects of office properties was influenced by lockdowns, empty offices, and a better-than-expected short-term outcome of the work-from-home (WFH) experiment. However, with a prolonged WFH period, the negative aspects of this model as a full-time approach have become evident and have balanced the consensus.¹

Employees yearn for a higher degree of flexibility and choice when it comes to time spent in the office, compared to working remotely. Because of this, more employers are adapting a hybrid work model in which in-office and remote work is split. While the level of flexibility will vary by industry and company, in aggregate, demand for flexibility from office users is set to rise.²

Coworking providers have been offering this type of flexibility for many years and have enjoyed a tremendous growth over the past decade.³ In the early stages of their evolution, coworking companies were focused on the membership model. Landlords perceived these companies as saviors because they typically leased otherwise less desirable space in older office properties or on lower floors.⁴ When coworking companies increased their focus on the enterprise model and began to sublease space in higher-end properties to larger corporate clients, it developed a conflict of interest for landlords. As a result, these landlords increasingly consider such flex office providers as competitors.⁵

EXHIBIT 1: TOTAL FLEXIBLE OFFICE INVENTORY (US AND CANADA)

Source: CBRE Research, Q2 2020



To navigate a higher demand for flexibility, landlords have a wide range of strategies at their disposal:

1. TRADITIONAL LEASES WITH COWORKING PROVIDERS

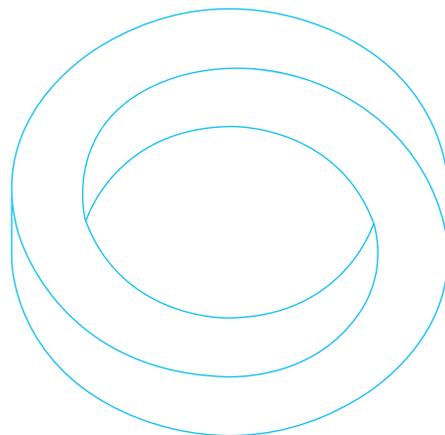
Traditional lease agreements with coworking companies provided landlords with some sense of security for their future cash flow via long-term leases with fixed rent payments—as well as benefitting from a strong leasing market fueled by the rise of coworking. For example, in 2018, these leases accounted for 11% of Manhattan’s leasing activity, rendering WeWork the largest private office tenant in that market, with an overall occupancy of 5.3 million SF.⁶ By the end of 2019, coworking providers occupied around 18 million SF (3.8%) of Manhattan’s office stock, and WeWork accounted for more than half of that.

Still, there were some risks and disadvantages that came with these direct leases. Long-term liabilities for coworking providers with short-term income results in a duration mismatch that elevates bankruptcy and renegotiation risks for owners.⁷ Most lease agreements were structured as special purpose vehicles with very limited or no credit support.

In the rare case of a parent guarantee, the entire lease liability was not covered, and was depleted over the first couple years of the term. The landlord expectation, or hope, was that larger coworking providers would not abandon selective locations to avoid reputational risk. This hope did not materialize; even the largest global coworking providers—Regus and WeWork—abandoned a meaningful subset of their traditional leases and renegotiated many into partnership agreements. Throughout the pandemic, several flex providers in Manhattan returned 5 million SF to their landlords, representing almost 30% of the island’s pre-pandemic coworking inventory. With that, Manhattan’s coworking share decreased from its 2019 peak of 3.8% to its current 2.9%. However, in Q1 2021 alone, WeWork signed agreements for 1.2 million SF of new flex space.

Further, enterprise usage creates direct competition with vacant spaces within the same or competing buildings. An increasing number of troubled coworking providers are either closing locations; trying to lease their vacant floors to enterprise tenants who could be direct landlord tenants; or adding their vacant spaces on the traditional sublease market. This activity is so prevalent that brokers are now tracking direct vacancy, sublease vacancy, and more recently, shadow vacancy from coworking companies.⁸

As bankruptcy risk is amplified with an increased share of coworking leases within a building or portfolio, the pre-pandemic consensus was that office buildings with more than 20% of coworking exposure are gradually experiencing a price discount for this portion of their income.⁹ Recently, investors and lenders are scrutinizing coworking exposure even more. For instance, at the height of the lockdown, some lenders even fully disregarded coworking income as a conservative base case for their lending base.



2. PARTNERSHIP AGREEMENTS WITH COWORKING PROVIDERS

Partnership agreements allow landlords to participate in the upside in exchange for (a) covering most or all of the upfront tenant improvements and (b) limiting the downside risk of fixed long-term lease obligations for the coworking partner.¹² These structures are evolving and range from complex profit-sharing agreements, simple revenue-sharing agreements similar to percentage rents in the retail sector, to management agreements on a fee basis. These arrangements decrease the conflict of interest between the two partners. There is a clear consensus that partnership agreements will continue to make up a larger share of the coworking arrangements. On a relative basis, Industrious—another leading coworking company—has been a trend leader in this regard, with 75% of its portfolio structured as partnership agreements.³

EXHIBIT 2: TRADITIONAL LEASES AND MANAGEMENT AGREEMENTS AT INDUSTRIOUS

Source: Industrious; H1 2020



Still, many institutional landlords are reluctant to convert traditional leases with coworking companies into partnership agreements. Mostly because of lower predictability of the net cash flow, the risk participation—which can be significant especially during downturns—and the consequent uncertainty surrounding the negative valuation impact and tradability of those agreements.

Sales comparisons that include partnership agreements are rare, and the details of the underlying agreements are only visible to a small group of potential investors who signed confidentiality agreements during the marketing process. Furthermore, the appraisal community is constantly playing the “catch-up game” with the speed of new contracts, credit risk, and other aspects that influence the value of such arrangements.

Office owners with a sizable portfolio within a market or country can create their own flex space provider under a self-run private brand.

3. CREATE-YOUR-OWN FLEX PROVIDER

Office owners with a sizable portfolio within a market or country can create their own flex space provider under a self-run private brand. Some high-profile examples are Studio (Tishman Speyer), Flex by BXP (Boston Properties), Flex+ (Irvine Company), Space+ (Washington REIT), and Hines Squared (Hines). The potential for this model seems significant considering that Tishman Speyer, for example, estimates their flex offerings could eventually make up 20% of their office portfolio.³

When landlords create their own flexible space offerings, they don’t necessarily need to use their own brand; they can alternatively incorporate that offering into their amenity space and limit the usage to tenants within the building. Especially for larger properties like Vornado’s Penn Plaza buildings in Manhattan, these spaces provide flexibility for existing tenants during short-term expansions, contractions, and renovations.

Aside from office landlords, other sectors are expanding their flex office offerings. The list of providers continues to grow and include hotel chains (Mandarin Oriental, CitizenM, Scandic), residential developers (Avalon Bay, Greystar, Hanover), shopping malls, department stores (Saks Fifth Avenue and WeWork, which formed SaksWorks), large broker houses (Newmark took over Knotel, CBRE increased their investment in Industrious, Cushman partnered up with WeWork), and companies such as Office Depot, Starbucks and other chain establishments.

4. EMBRACE SHORTER LEASE TERMS AND SPEC SUITES

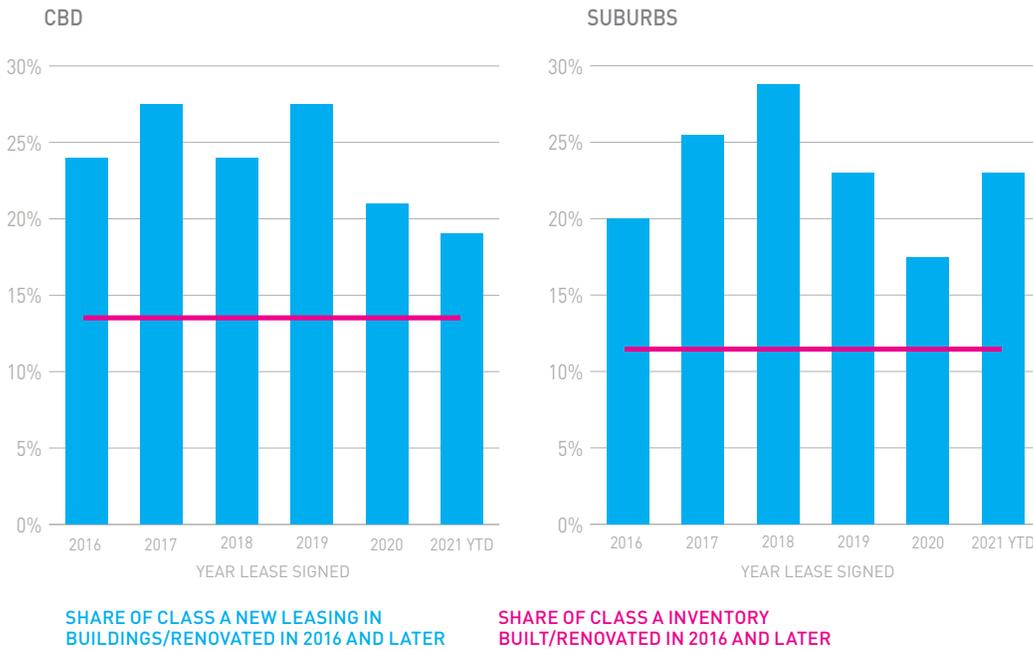
While landlords desire secure, long-term leases and predictable cash flows that in turn promise to create a strong valuation, the trend of increased demand for flexibility has made these criteria somewhat harder—but not impossible—to achieve. As such, landlords may be enticed to embrace shorter lease terms to alleviate some of the advantages that occupiers typically seek from coworking providers. Owners can offer these shorter terms at higher net effective rents in return for flexibility.¹¹

To reduce downtime for landlords and increase the availability speed to the occupiers, owners are also increasingly pre-building office space within their properties. These so-called spec suites further satisfy occupiers’ desires for lower capex investments while reducing tenant improvement costs for landlords via economies of scale in the buildout process. With spec suites, owners can also use a more generic, but modern fit-out design that many spec occupiers would find attractive, further reducing re-tenanting costs. With this strategy, landlords are especially aiming to recapture the decrease in direct leases with smaller tenants of 10,000 SF or less.¹²

However, spec suites and other aforementioned concepts directly compete with sublease availability, which has increased significantly during the pandemic. While sublease availability has started to decline, it is still at an extremely elevated level of over 20 million SF (4.4%) of Manhattan’s office inventory.¹⁹ This competition is meaningful, as the space is already built out and available in various sizes and lease duration. Even if sublease space requires a more individualized negotiation, offers a more uneven build-out quality, and a lower level of service, it can be an attractive alternative for end-users. And in certain instances, especially during a recession, the discount on the sublease rental rate could reach 30%.¹³

EXHIBIT 3: LEASING OUTPERFORMANCE; SHARE OF NEW LEASING IN BUILDINGS BUILT OR RENOVATED IN 2016 OR LATER

Source: Cushman & Wakefield Research



5. OWN HIGHER QUALITY BUILDINGS

In this evolved landscape, landlords must navigate various strategies based on their preference for risk exposure and operational engagement. There is no one-size-fits-all approach and every owner must decide how much exposure to internal or external coworking providers. But recent closings and market corrections in that space show that the recession risk for those business models are real, despite the early signs and the market expectation of an even stronger demand for flex offerings, once the pandemic is behind us.

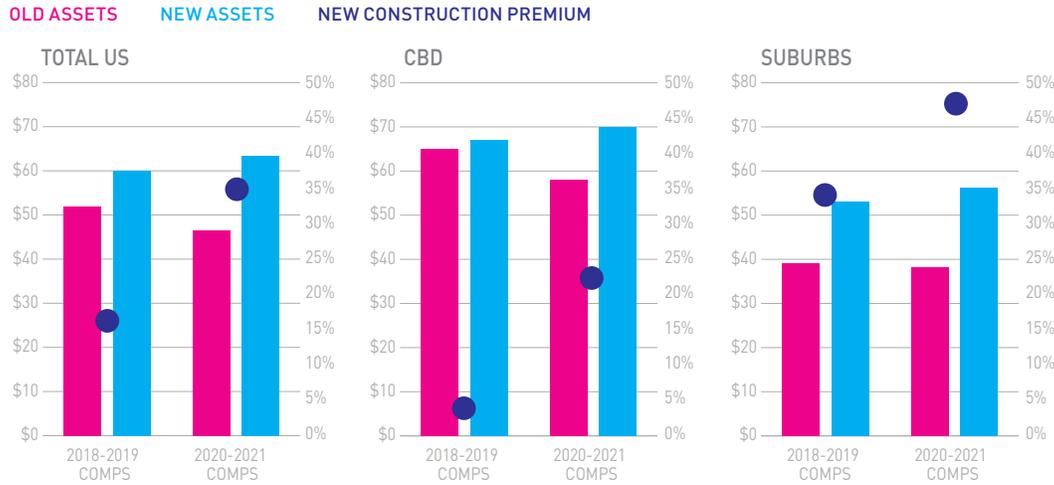
The countless options and seemingly limitless offerings by various landlords and flex providers illustrate the common belief in a significant increase in demand for flexibility and also underscores the fragmentation of the market.²¹ Landlords are well-advised to take flex demand seriously, but their desire for long-term leases is deeply rooted in how these leases impact valuation and sale prices.

Another core defensive strategy for landlords is to focus on higher quality assets. These buildings have shown resilience by attracting desirable, strong-credit tenants with long-term leases—even during the pandemic. For example, Vornado Realty Trust, one of Manhattan's largest owners of trophy office properties, reported an average lease term of 14.4 years for their Manhattan leasing activity in 2020—which included the fifteen-year Facebook lease at the Fairley Building and NYU's long-term lease extension at One Park Avenue. This trend continued in 2021, where for instance SL Green continued to secure additional leasing activity during the pandemic and reached 91% occupancy for their trophy office tower One Vanderbilt – with some of the lease rates even breaking through the \$200/SF barrier.¹⁴ But this trend goes beyond trophy assets. Over the last five years, CBD leasing activity in newer assets (built or renovated in 2016 or later) accounted for 25.3%, while their inventory share is just 14.4%, representing a factor of 1.7x. Additionally, these assets demanded a 35.2% rent premium over the past two years. So while older assets experienced an average rent decrease of 9.7%, newer assets generated a 4.9% rent increase.¹⁵

The countless options and seemingly limitless offerings by various landlords and flex providers illustrate the common belief in a significant increase in demand for flexibility and also underscores the fragmentation of the market.

EXHIBIT 4: RENT PREMIUMS; CLASS A DIRECT NEW LEASES WITH 7+ YEARS OF TERM

Source: Cushman & Wakefield Research



Additionally, these high-end assets experience higher-than-average rent collection, as the respective tenants generally continue their rent payments despite low physical occupancy or sublease activity.¹⁶

Overall, there is a strong business case that owning highly amenitized trophy assets in desirable locations is crucial to the health of the investment portfolio throughout the economic cycle, and even partially protects against an increased demand for flexibility.

ABOUT THE AUTHOR

Tal Peri is Head of US East Coast and Latin America for Union Investment Real Estate, Germany’s largest open-ended real estate fund with a global AUM of US\$57 billion.

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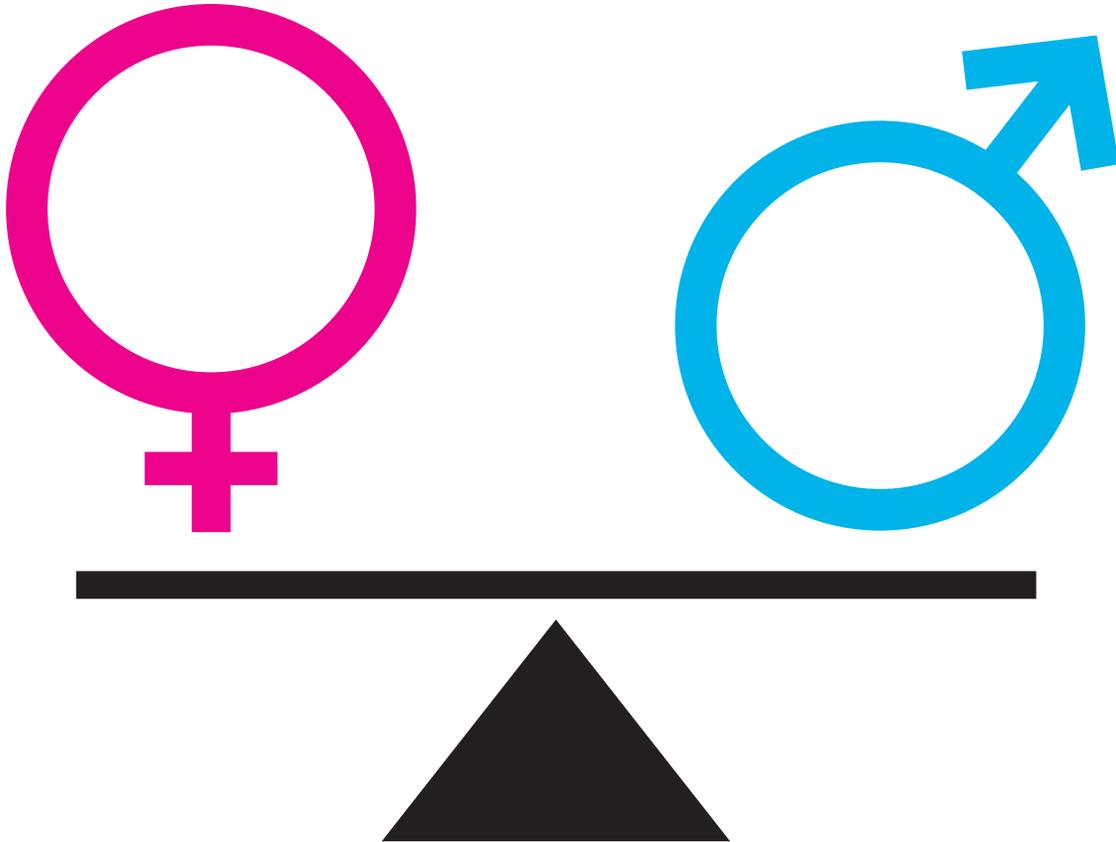
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Overall, there is a strong business case that owning highly amenitized trophy assets in desirable locations is crucial to the health of the investment portfolio throughout the economic cycle, and even partially protects against an increased demand for flexibility.

TALENT PARITY



By Isabel Ruiz Halter
Director, Global Real Assets Practice
Sheffield Haworth

To be better prepared for future risks, firms need diverse talent. So is the goal of 50% female representation achievable in global real estate investment and asset management firms?

Senior HR managers in global investment and asset management firms agree that retaining and developing female talent is important but aren't yet clear on how best to achieve it.

In Summer 2021, Sheffield Haworth, a leading global executive search, talent advisory, and interim consulting firm where I serve as Director within the Global Real Assets Practice, hosted a roundtable discussion with senior HR managers within leading global real estate investment and asset management companies. The speakers shared the trends they were seeing within their firms regarding gender diversity before discussing the challenges of adapting to hybrid working and talking through examples of how else they have attempted to foster female talent.

A COUPLE OF POINTS BECAME CLEAR EARLY IN THE DISCUSSION:

Increased gender diversity—and, in particular, having more women in decision-making roles—has helped real estate investment firms to become more profitable by increasing productivity and innovation, strengthening team dynamics, and reducing staff turnover. Therefore, there is not just a social reason to retain and develop female talent, but also a strong commercial case.

Firms want to achieve the target of 50% female representation at senior, middle, and junior levels, but this may be a slow process—and it is not yet clear how hybrid working may impact this goal.

COVID IMPACTED WOMEN LESS THAN EXPECTED

Despite multiple studies suggesting the pandemic has impacted women worse than men in the general economy, this seems not to have been the case within the private markets and real estate sectors. Speakers in our forum reported that their firms had seen no specific rise in women being made redundant or choosing to leave work.

That said, lockdowns and remote working loosened the bonds between teams due to lack of face-to-face contact. Most firms are now looking ahead to hybrid working and ways to successfully promote company culture.

50/50

PROS AND CONS OF HYBRID WORKING FOR SENIOR LEADERSHIP TEAMS

Many firms see hybrid working as way to foster flexibility, trust, and high productivity amongst staff. Having some time in the office should help to restore collaboration and team spirit, while boosting engagement. Firm leaders also see hybrid working as a means to become more attractive to top talent—including female talent, as many women favor flexibility, especially if they are working parents.

However, the speakers did say that many firms are apprehensive about how the hybrid model will work in practice. Some are worried that allowing employees to stay working from home may exacerbate the problem of employees not feeling engaged.

POSSIBLE CHALLENGES OF HYBRID WORKING FOR WOMEN

The speakers added that the hybrid model could prove negative for many women—particularly those who value the opportunity to spend more time working from home. The general feeling appears to be that those who spend the most time in the office will be most likely to get preferential treatment and progress their career over those who spend more time working from home.

Statistically, given that working mothers are most likely to want more time at home to look after children, the risk is that men are more likely to spend more time in the office while women spend less time in the office.¹ The result could be that women lose out on career progression opportunities, hampering the development of female talent across the industry.

At the same time, for working mothers, spending some time in the office and some at home could make it more difficult to arrange childcare, unless the specific days are fixed. Flexibility and reliable childcare do not always align.

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HOW ARE FIRMS APPROACHING HYBRID WORKING?

Speakers expressed that firms were being overly negative about blending work from home and office, likely due to the apprehension and uncertainty with which real estate firms regard hybrid working. One said that it was important for senior leaders, middle managers, and junior employees equally to approach hybrid working with a positive mindset, as a negative mindset would make failure more likely.

On a practical level, firms have been testing a variety of approaches to hybrid working:

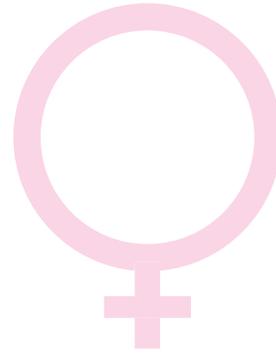
- Some firms have started hybrid working as of September 2021, while others are waiting until January 2022.
- Larger firms tend to give their business heads and managers more flexibility over how to implement hybrid working (for example, how many days per week to expect their staff to come to the office).
- Smaller firms tend towards taking a more top-down “directive” approach, with the most common approach being to ask employees to work in the office three days per week, with the days being fixed.

Most attendees and speakers agreed that commitment to returning to the office is important to mitigate the potential inequality between men and women, as well as to help support junior analysts, who will likely benefit most by learning from more senior employees.

Some firms are asking their employees to take lateral flow tests for COVID-19 and, while some US firms are making vaccination mandatory before returning to the office, UK and European firms are largely not following this lead. Some companies are, however, requiring employees to fill out a health form every day unless they have been double-vaccinated. The thinking is that younger employees are less likely to be vaccinated and may need more monitoring or supervision.

Most companies agree that they won't implement a fully remote working model. McKinsey recently performed an analysis on remote working and how it affects different industries, stating:

“More employers have found during the pandemic that although some tasks can be done remotely in a crisis, they are much more effectively done in person. These activities include coaching, counseling, and providing advice and feedback; building customer and colleague relationships; bringing new employees into a company; negotiating and making critical decisions, among others.”²



WHAT ELSE ARE FIRMS DOING TO SUPPORT THEIR FEMALE TALENT?

Besides hybrid working, the speakers discussed other initiatives real estate firms have been trying to help support women, with a particular focus on parents.

For example, many companies have updated their maternity and paternity policies to allow for more flexibility. During lockdown, several companies provided access to psychologists and coaches to help parents handle home schooling while working, and to face the mental-health challenges of being a parent during a pandemic. Many of these companies are continuing this kind of coaching going forward, such as offering support to parents for returning to the workplace.

Other initiatives to support parents with younger children include a maternity ‘buddy’ system and setting up parents’ resource groups.

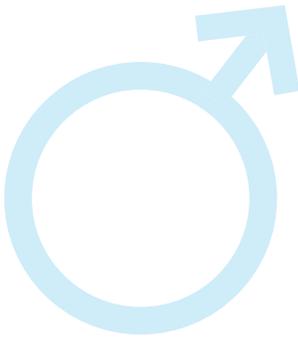
And more broadly, during lockdowns, several firms set up online groups for employee networking, such as “Friday clubs,” which aimed to offer a fun, social outlet to help relieve the pressures of lockdown. The speakers felt that this social dynamic could be particularly helpful for women, and that having intentionally designed employee groups focused on promoting relationship building and facilitating honest, candid conversations, was key to foster the team dynamic during remote working—especially for working women.

Some companies are providing training to employees returning to the office, in part to help improve engagement and business discipline. Courses around how to have more productive meetings, collaborate more effectively or leadership development programs. Speakers felt this would be beneficial to women because it allows them to share best practices, improve their confidence and ultimately it makes succession planning easier.

WHAT ARE REAL ESTATE INVESTMENT FIRMS DOING TO DEVELOP MID-LEVEL FEMALE LEADERS?

As in many industries, the real estate sector has seen increased gender diversity in graduate recruitment, as well as more women in senior leadership roles. The speakers noted that their biggest challenge is developing women with around ten years of experience into middle management, where they remain particularly underrepresented. Here, the speakers discussed several initiatives, including:

- Mentorship programs, both formal and informal, including one-to-one mentoring where ambitious female employees are matched to appropriate senior mentors by HR.
- Discussion groups, both those organized by companies and informal ones set up by employees, focusing on topics such as networking, negotiating, and building confidence.
- Paying for online learning platforms from third parties on useful skills—a particularly cost-effective option for smaller firms with fewer resources.
- Motivational coaching focused on middle-management skills, behaviors, and mindsets.
- Investing in personal development of female talent and incentivizing senior managers to spot and develop female talent.



LOTS OF IDEAS, BUT WHERE TO GO FROM HERE?

Real estate investment companies agree on the importance of developing female talent. However, while the discussion highlighted several initiatives firms had already taken and were considering taking, there was no clear consensus on what works or is likely to work most effectively.

The main reason for this lack of consensus is the lack of data to prove what works, especially given the destabilizing effect of the pandemic and the uncertainty around how hybrid working may affect women in particular. At the end of our Summer 2021 roundtable discussion, attendees and speakers alike agreed that the desire to succeed was genuine, and firms were willing to try new ideas, and so agreed to organize a follow-up roundtable to focus on tangible, practical solutions.

The answer to the question of whether 50% representation is achievable for women in real estate is ultimately dependent on who you ask. However, the senior HR managers from our own view in the real estate sector believe this goal is achievable, and is actively committed to finding workable solutions. It will be exciting to see what comes next.

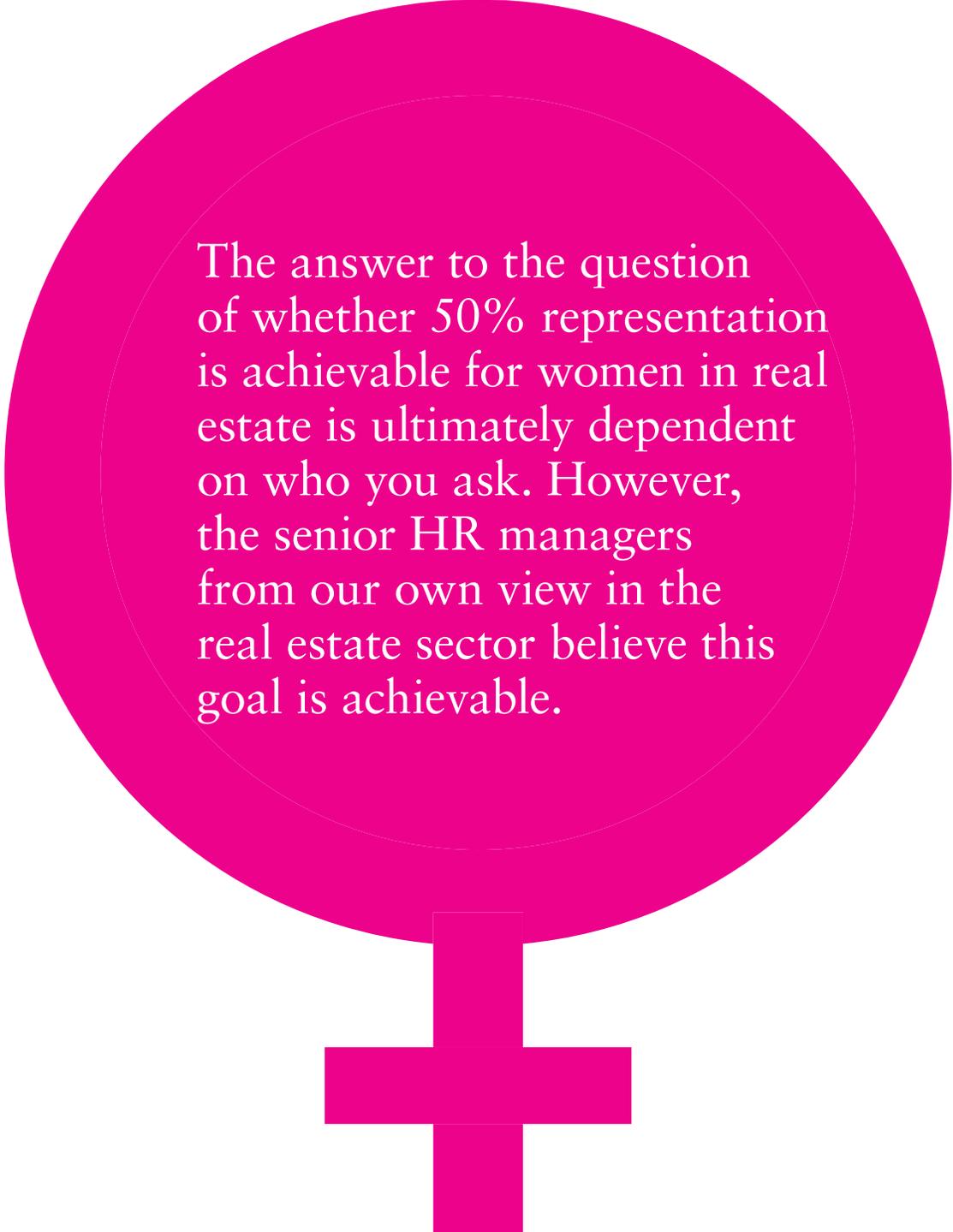
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Isabel Ruiz Halter is a Director in the Global Real Assets Practice at Sheffield Haworth, a leading global executive search, talent advisory, and interim consulting firm.

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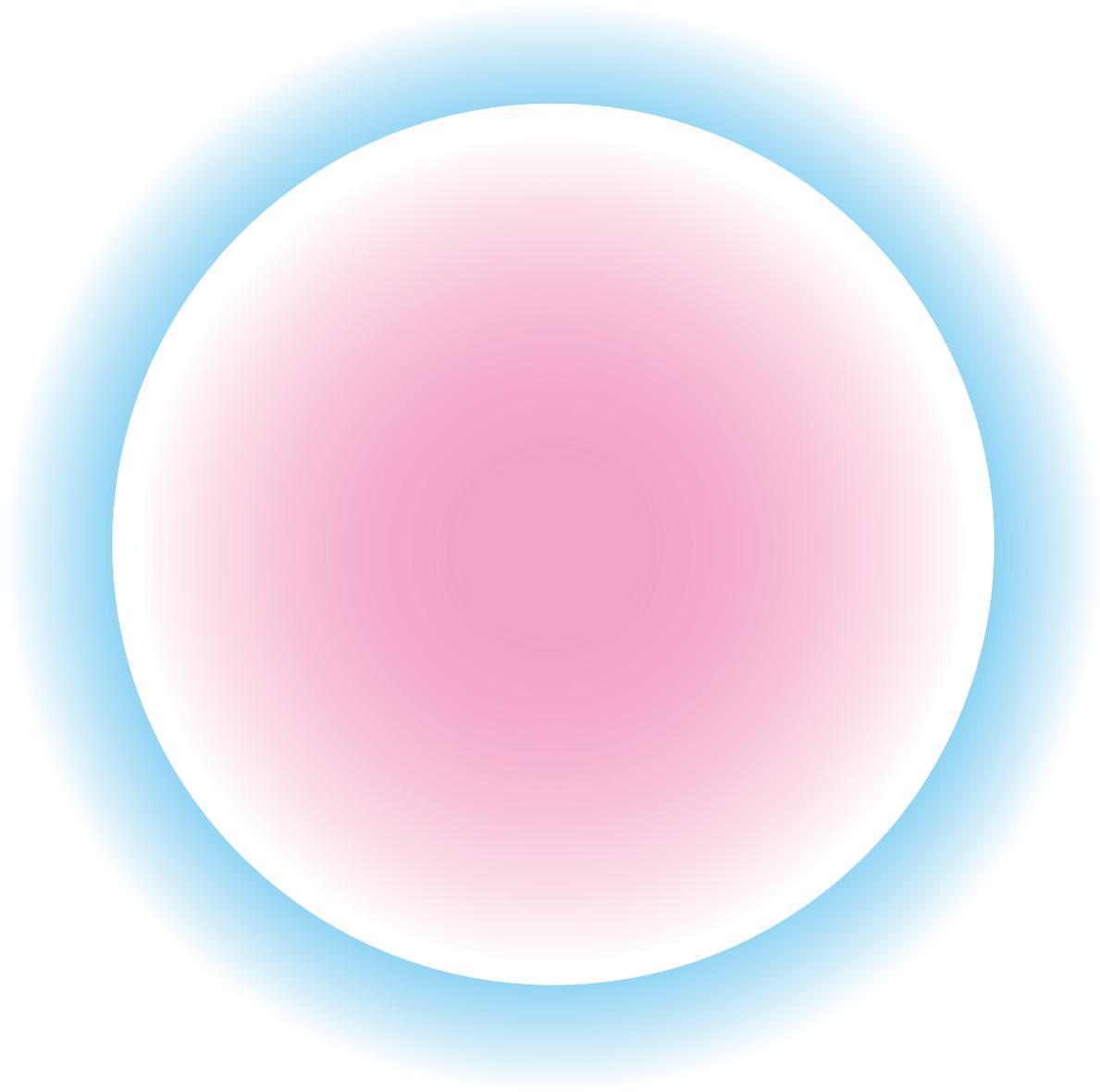
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PREDICTING THE CLIMATE FUTURE



By Rajeev Ranade
Partner
Climate Core Capital

Owen Woolcock
Partner
Climate Core Capital

We are all invested in the cities, assets, and infrastructure of tomorrow, even if we might not live to see the ten largest cities in 2100. But understanding climate change can get us closer.

CAN YOU GUESS WHAT THE TEN MOST POPULATED US CITIES WERE IN THE YEAR 2000?

New York and Los Angeles would be safe bets and come without hesitation. A moment's pause, and Chicago would come to mind. Those who follow cities might remember that San Francisco and San Jose are separate in most data; skip them and reason that Houston and Philadelphia came next. The rest of the top ten would hardly surprise: Phoenix, San Diego, Dallas, and San Antonio all were warm and with large job markets. Detroit in tenth, was a city in decline but still servicing a healthy domestic auto industry.

NOW HERE IS A TOUGHER QUESTION: WHAT WILL BE AMERICA'S TEN LARGEST CITIES IN 2100?

In 1900, the five largest cities (in order) were New York, Chicago, Philadelphia, St. Louis, and Boston. Each had intuitive reasons for their dominance: coastal or river access, strong rail connections, trading advantages, culture, history, and even then, a lot of accumulated wealth in a select group of people and firms. And then Baltimore, Cleveland, Buffalo, San Francisco, Cincinnati round out the 1900 top ten.

SO, WHAT HAPPENED OVER THE PAST HUNDRED YEARS?

To answer that, let's transport ourselves to the edge of a blackjack table in Las Vegas. When the sum of the current hand adds up to seventeen, an experienced gambler can calculate whether they will go over twenty-one if they ask for another card. The card coming next is still a random variable, and the gambler might lose; but their experience gives them a marginal advantage in making an educated prediction. Few of us are good at predicting the future, but we all try to gain marginal advantage wherever we can.

Why is the blackjack decision at seventeen so illustrative? Because the real estate universe is constantly evaluating (then betting on) the place-based features of every market. It might not be framed in this language often, but if you're investing in cities in any way, you're effectively making bets on that city's future; knowing a lot, but never enough to fully predict the card coming out of the hand.

WHAT'S CHANGED IN THE GAME?

Modern humans are most comfortable between 70–80°F (21°C–27°C), which is the range our ancestors lived in across several regions of Africa. For the past 6,000 years, most people have been able to thrive in regions where the average annual temperature has always been between 52°F (11°C)—weather roughly equivalent to the climate of London, UK—and 59°F (15°C), equivalent to an average day in Rome, Italy, or Melbourne, Australia. People can settle and thrive beyond these averages, but it is important to bear in mind that the comfort zone for outdoor human activity is limited.

Humans have artificially expanded the comfort zone through ingenuity, discretionary outdoor activity, and, above all, technology. The invention and mass proliferation of refrigeration, and heating, ventilation, and air conditioning (HVAC) systems had a monumental impact on life in the twentieth century, especially in equatorial and polar latitudes: but the 70–80°F temperatures described above still represent something referred to as the “human niche.”

This is an important point to understand, because it's bigger than the mental model of the real estate industry. Our ancestors located many cities in places that now must contend with new physical risk, or well-known risks at a new scale of damage and cost. Most

harbors have been erected right up to the water's edge. Many cities are in narrow waterways that tend to surge in a storm. Major inland populations are in floodplains, as well as other settlements on valley floors where fast-moving fires can cover hectares in seconds.

These kinds of hazards are often where the mind turns when thinking about a changing climate. Disasters are low-probability events with potential large-scale consequences, and we can visualize a clear “before” and “after” to imagine the risk. But a slow-onset hazard, such as extreme heat stress or air pollution, takes months or years to develop and will likely kill many more people than other more dramatic types of disasters. Moreover, slow-onset hazards are permanent, making the changes more dire compared to a single disaster.

What do these new inputs mean? It will force previously high-demand locations to pay for adaptation or risk a slow, difficult, and unequal process of divestment. Each market has specific, overlapping threats, and the science predicts scenarios that range from nuisance-level to catastrophic, depending on location. Investors need to ask: how much do I know about the markets I'm invested in, and what is my risk appetite?

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HOW HOT IS TOO HOT?

Now let's return to the question of what will be the ten largest American cities in 2100, and what does the story from 1900 to 2000 tell us?

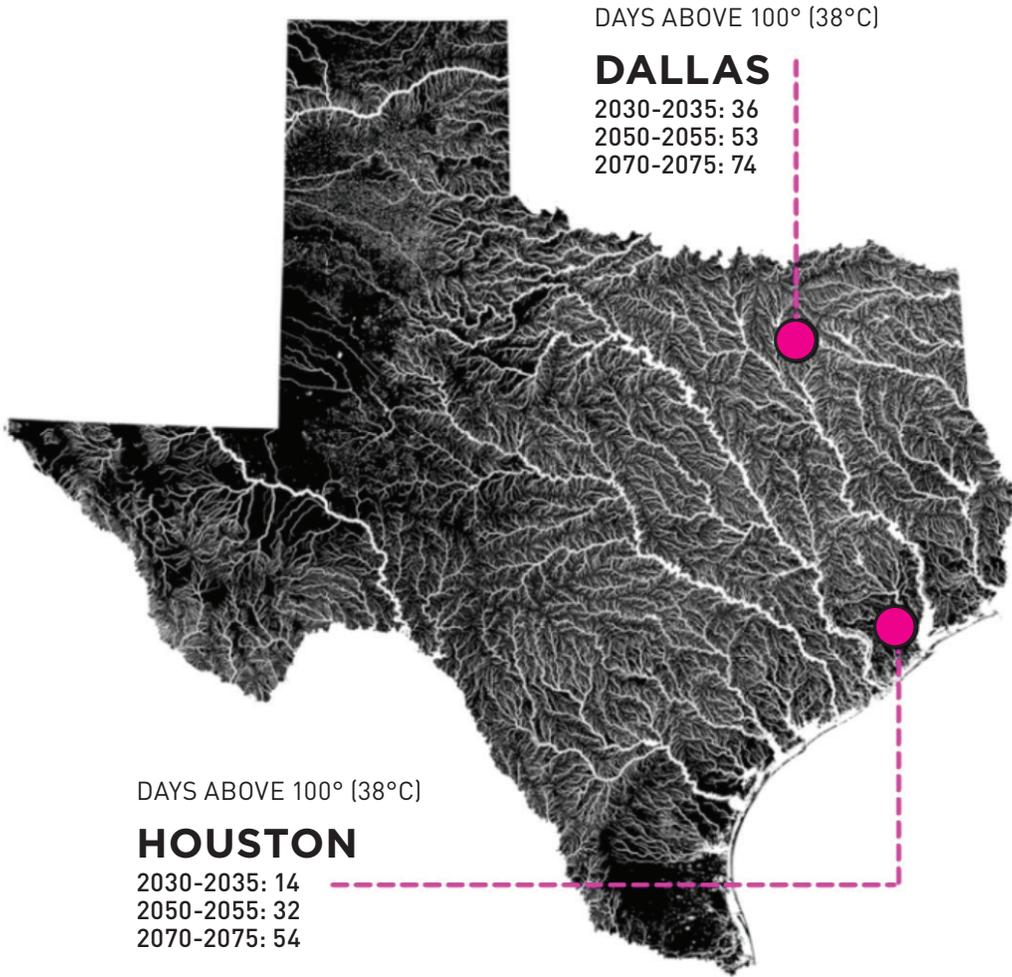
St. Louis lost its place from 1900 to 2000 because of the advent of the automobile, changes in manufacturing, and globalization. Houston or Dallas might well lose their respective places from 2000 to 2100 not only because of the falling demand for fossil fuels, but also because it becomes too hot to live there.

As part of a research collaboration between leading climate data firm risQ, Climate Core Capital, and the Harvard Graduate School of Design, scientists are exploring the timescales on which many US cities are likely to experience the historical climate of Death Valley, California—the location of the hottest temperature recorded by humans on Earth, a staggering 130°F (54.4°C). With so much focus on this record, it is easy to forget Death Valley still records plenty of other temperatures. The climate scientists wanted to ask a simple question: when will other US cities begin to see the same number of 95°F (35°C) days that Death Valley saw from 1981–2010?

When lethal heat waves become a more common occurrence in warm southern cities, what will it really cost us?

EXHIBIT 1: HOUSTON AND DALLAS, PROJECTED DAYS ABOVE 100°F

Source: Climate Core



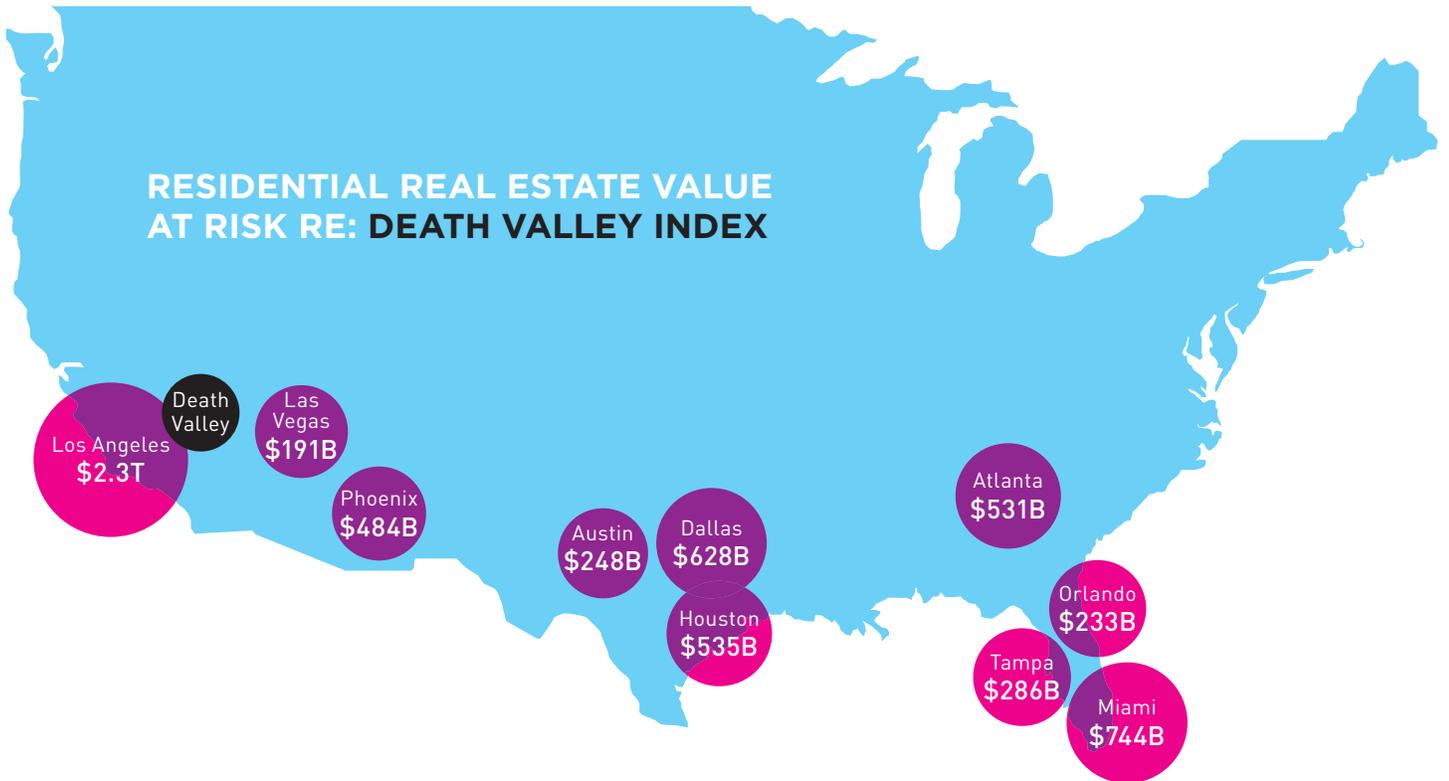
100°F

When lethal heat waves become a more common occurrence in warm southern cities, what will it really cost us? A joint collaboration between risQ, Climate Core Capital and the Harvard Graduate School of Design examined the projected dates when the combination of heat and humidity will result in a host of major US cities experiencing the same average number of 95°F (35°C) days as Death Valley recorded over the 1980–2010 period. Researchers compared these values against the total residential real estate value of each market in present day terms (Q4 2020), providing a fresh lens on the capital at risk when millions will find it difficult to live as we do today in an increasingly warmer world.

Death Valley National Park is the site of the hottest temperature ever recorded by humans—134°F (56.9°C). In July 2021 it recorded an average temperature of 118°F (47.7°C), the highest average daily temperature observed on Earth. From 1981-2010, Death Valley recorded an average of 161 95°F (35°C) days per year, a temperature that risks severe heat stress with just a few hours outdoors. The table to the right shows when the combination of temperature and relative humidity will make a range of US cities feel like the historical climate of Death Valley.

EXHIBIT 2: THE DEATH VALLEY INDEX

	YEAR WHEN CITY COULD HIT DEATH VALLEY TEMPERATURE RANGE	HOW OLD A CHILD BORN IN 2021 WILL BE WHEN CITY HITS DEATH VALLEY TEMPERATURE RANGE
ORLANDO	PRESENT	--
HOUSTON	2021-2026	0-5
MIAMI	2021-2026	0-5
AUSTIN	2022-2027	1-6
TAMPA	2024-2029	3-8
PHOENIX	2033-2038	12-16
DALLAS	2063-2068	42-47
LAS VEGAS	2080+	60+
LOS ANGELES	2080+	60+
ATLANTA	2080+	60+



The most telling early findings have been related to the sixth biggest city in 2000: Phoenix, AZ. The sunbelt hub will see 150 to 170 days per year with peak temperatures at or exceeding 95°F (35°C) from the mid 2030's. To put this figure into perspective: if a homeowner purchased during the pandemic in 2020–21, and took out a thirty-year mortgage, it will be too hot to be productive outside nearly half the year, halfway through their debt repayment schedule.

The best investors relate to the tenant or end user experience. Put yourself in the shoes of a Phoenix resident in 2036, with 150 to 170 days per year at or above 95°F (35°C). Will there be Little League tournaments on weekends? How might it change school timetables? What hours of the day in the warmer months will it be safe for roadworks and maintenance to occur? Who will keep up their front gardens and lawns, and what plant species still thrive in those temperatures? What kind of health insurance products might need to be developed for heat stress, and might it be additional to a standard policy? Could the energy efficiency of your home or office be linked to how willing an insurer might be to cover you for personal health?

None of these facts are meant to talk down Phoenix, or sound like a harbinger of doom for a real estate market that's seen remarkable growth in the last few decades. There are many other markets with similarly troubling data points. But it's worth putting yourself back at the blackjack table, knowing these facts (knowing that you're holding cards adding to seventeen), and asking a simple question: am I being adequately compensated for my risk?

HOW COULD THE NUMBERS CHANGE?

Investors who incorporate physical climate risks at the asset level will need to factor in new inputs on valuation and cap rates. An example is in the state of New York, which passed a net-zero carbon law in 2019 with specific building emissions targets for 2024 and 2030.

An asset manager might hold a Manhattan building in their portfolio that was below the 2024 target, but above the 2030 target, and surmise that improvements to comply are a waste of capital when they will have already sold the asset by 2030. This avoids the reality that the future buyer will look at the 2030 targets, and likely adjust their offer price accordingly.

Astute industry participants can't rule out the possibility that buyers develop a sophistication on climate risk in a short space of time and cap rates expand to reflect these new risks. Each asset will be different, and each market will be different, but to assume the status quo would be risky.

A new mental model for real estate investors should ask some of the following questions:

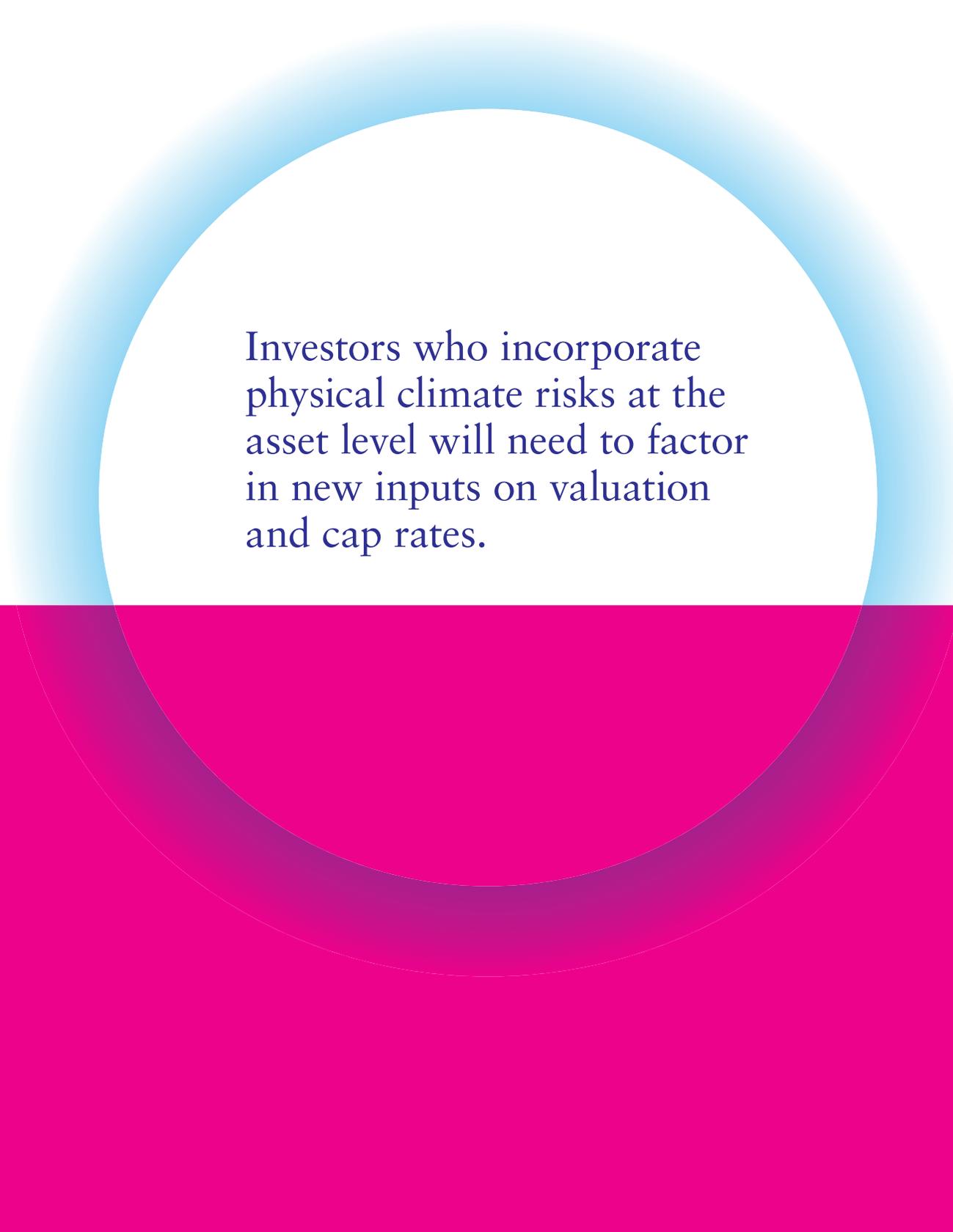
- In the markets where I invest, will public and private stakeholders coordinate toward resilience? What are the signs this is occurring?
- Do investment time horizons align with my risk appetite?
- Should climate change frame my underwriting and perception on equity, debt, and the capital stack?
- How do I stay informed and engaged on evolving climate risks?

One thing is certain: the institutional investor community isn't going to stop playing blackjack, even if the variables are about to change. We are all invested in the cities, assets, and infrastructure of tomorrow, even if we might not live to see the ten largest cities in 2100.

It's increasingly crucial for investors of all sizes to incorporate climate change in their mental model, and with the best information available, invest with a marginal advantage.

ABOUT THE AUTHORS

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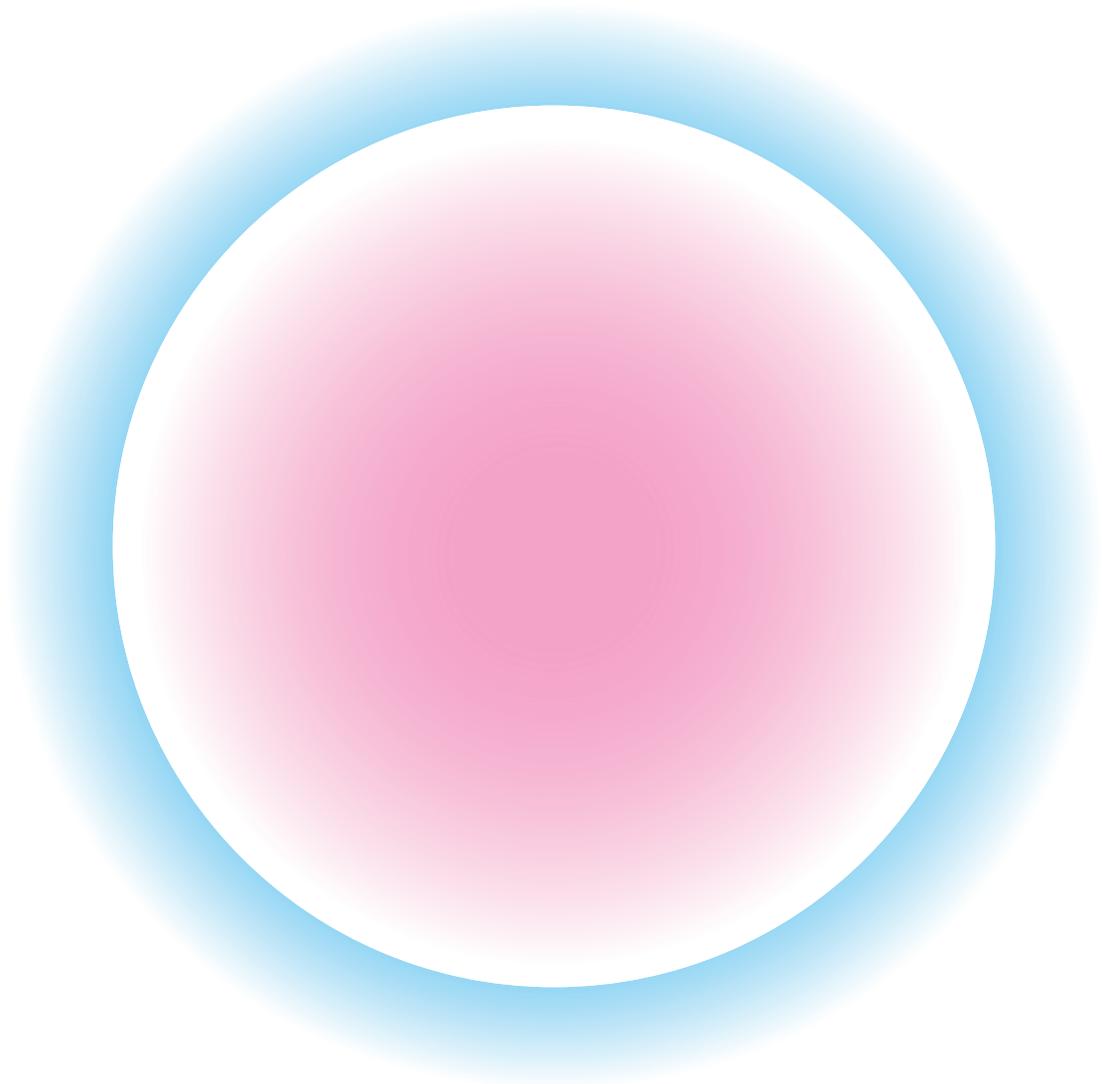
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