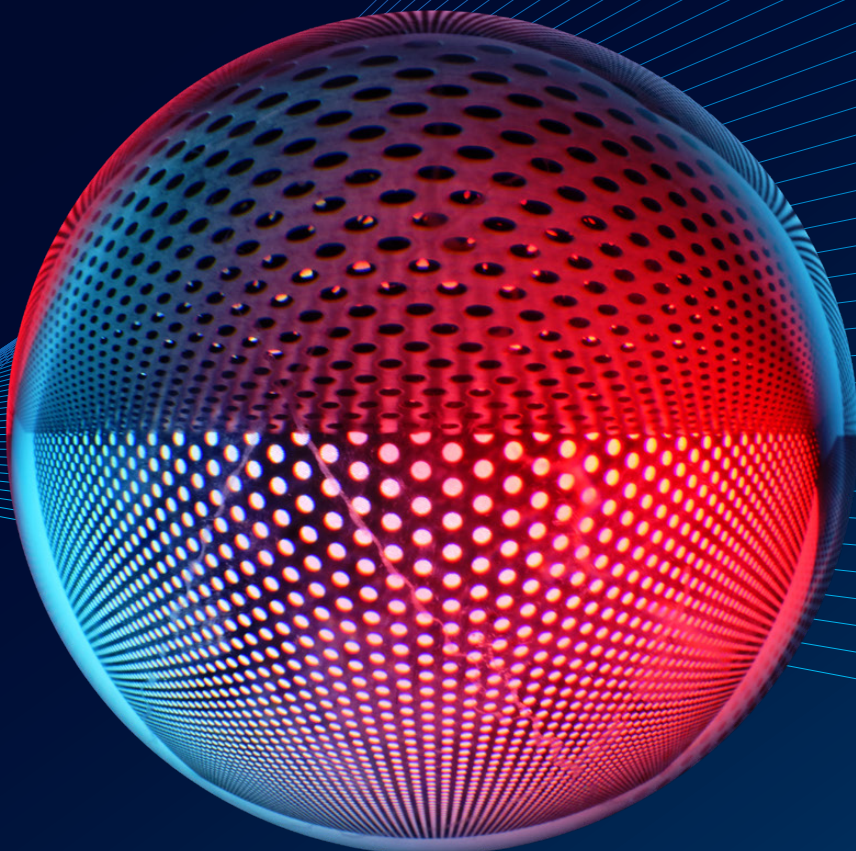


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# McKinsey on Investing

Perspectives and research for the investing industry

Number 9, November 2023

*McKinsey on Investing* is written by experts and practitioners at McKinsey in the Private Equity & Principal Investors, Wealth & Asset Management, Capital Projects & Infrastructure, and Real Estate Practices, and at Fuel, a McKinsey company focused on growth businesses.

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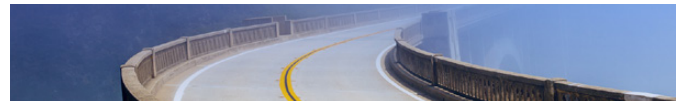
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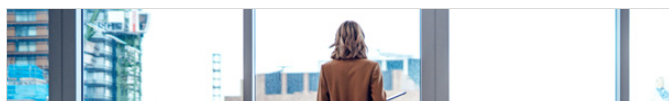


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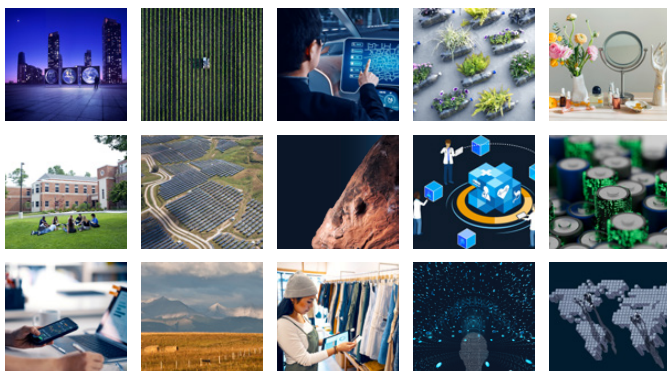


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# Introduction

Welcome to the ninth volume of *McKinsey on Investing*, our flagship compendium of insights relevant to investors of all stripes. These perspectives have been contributed by McKinsey colleagues across the globe whose diversity of expertise is reflected in the contents of this edition.

The world is on the cusp of a new era. After decades of stable economic order and low interest rates that helped drive strong returns and steady growth, investors now face a world that is more globally entwined, financially leveraged, and carbon constrained.

Our research has sought to uncover insights on how leaders are navigating these disruptive times and finding new opportunities to deliver returns. We begin with some notable facts and figures that highlight key themes shaping the investment landscape. Three articles then examine how firms are responding to these opportunities, including the latest results from our annual report on the state of diversity in private markets. In the subsequent section, we explore the potential of AI—the most talked-about technological trend of 2023 and one that could make a profound impact in the coming years. We then feature insights from our Private Equity & Principal Investors and Real Estate Practices about how resilience can help companies thrive during disruptive times, followed by 15 pages of insights curated from a broad cross-section of McKinsey's sector research. The final section looks at how investors can accelerate progress in delivering sustainable, inclusive growth.

We hope you enjoy this collection and find ideas worthy of your consideration. You can find these and other perspectives that are relevant to investing at [McKinsey.com/Investing](https://www.mckinsey.com/Investing) and in our McKinsey Insights app, available for [Android](#) and [iOS](#).

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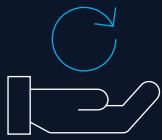
*Gary Pinshaw*

*David Quigley*

*Brian Vickery*

# Notable facts and figures

Amid uncertainty, leaders are adapting their search for investments and continuing to make steady progress to achieve inclusive growth.



## 9.5%

Annual returns produced by the median institutional investor from 2012 to 2021<sup>1</sup>

## 48%

Share of entry-level private equity roles held by women<sup>2</sup>

## \$350 billion

Amount committed by US investors to promote inclusion and economic mobility for Black Americans<sup>3</sup>



## 62 years

Time required to reach gender parity in investing roles at the managing-director level<sup>4</sup>



## \$104 billion

Aggregate equity investment in applied AI<sup>5</sup>

## \$374 billion

Amount of global private capital invested in software<sup>6</sup>

## \$50 billion

Investment in construction technology, driven by increase in digitization and innovation<sup>7</sup>



## 20%

Estimated decrease in demand for office space across most global cities by 2030, compared with 2019<sup>8</sup>

<sup>1</sup> "Performance edge: Investors hone their strategies for a new era," McKinsey, July 10, 2023.

<sup>2</sup> Data as of 2022. "The state of diversity in global private markets: 2023," McKinsey, August 22, 2023.

<sup>3</sup> From May 2020 to July 2022. Dylan Forgione, Nick Noel, Shelley Stewart III, and Ammanuel Zegeye, "A guide to impact investing in Black economic mobility," McKinsey, February 1, 2023.

<sup>4</sup> "The state of diversity in global private markets," August 22, 2023.

<sup>5</sup> Data as of 2022. "McKinsey Technology Trends Outlook," McKinsey, July 20, 2023.

<sup>6</sup> Data as of 2022. Christian Berends, Sébastien Chaigne, Julien Didi, and Alexander Rajko, "Where could \$374 billion in dry powder go? Six themes to watch," McKinsey, July 25, 2023.

<sup>7</sup> Between 2020 and 2022. Jose Luis Blanco, David Rockhill, Aditya Sanghvi, and Alberto Torres, "From start-up to scale-up: Accelerating growth in construction technology," McKinsey, May 3, 2023.

<sup>8</sup> "Empty spaces and hybrid places: The pandemic's lasting impact on real estate," McKinsey Global Institute, July 13, 2023.

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# The investors that matter still want to focus on the long term

Our latest survey of chief investment officers of long-horizon equity funds shows (again) that they seek to invest in companies that prioritize long-term business fundamentals over short-term targets.

*by Jay Gelb, Rob McCarthy, Werner Rehm, and Andrey Voronin*



**To say that shareholders** care most about today's stock price movements has become a truism. And perhaps some truly do feel this way. It's hard to emerge from a quarterly earnings call without the impression that at least *analysts* care a great deal about meeting upcoming targets.

Long-term institutional investors (also known as intrinsic investors), however, care more about the long-term drivers of value creation. Our research has shown that these investors have an outsized influence on a company's stock price over time. The results of our latest survey of chief investment

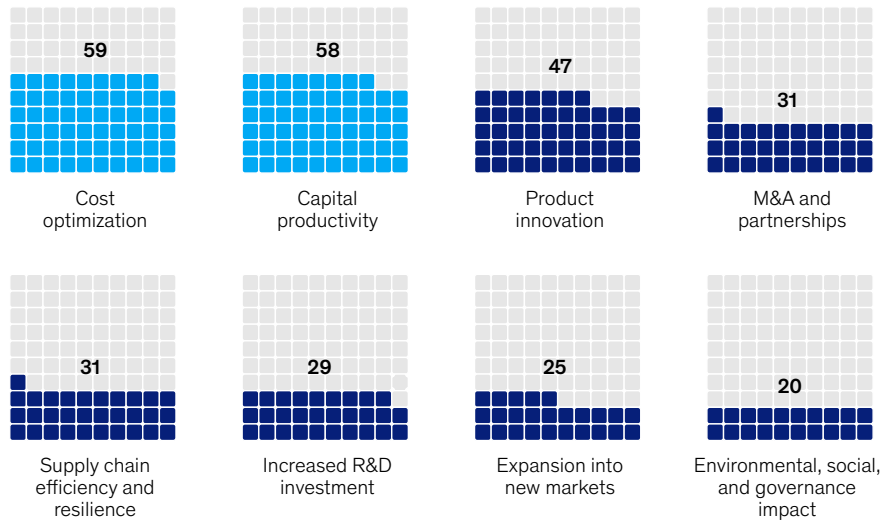
officers of leading global funds that make large, selective investments in equities reflect these points.<sup>1</sup>

The respondents make clear that their funds prioritize sustainable value creation over “short termism” and favor CEOs who move quickly and boldly to reallocate a company's capital to enable value-creating growth. Asked to rank the three most important drivers of long-term value creation, respondents bear down on the basics: cost optimization, capital productivity, and product innovation (Exhibit 1).

Exhibit 1

### Surveyed investors prioritize traditional drivers of long-term value creation.

Top drivers of long-term shareholder value creation, % of respondents (n = 19)<sup>1</sup>



<sup>1</sup>Instruction: please indicate the 3 most important drivers of long-term shareholder value creation across industries in the current market environment. Source: McKinsey Investor Survey, 19 chief investment officers of leading investment funds, September 7–October 11, 2022

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<sup>1</sup> The survey was in the field from September 7 to October 11, 2022, and garnered responses from 19 chief investment officers of leading investment funds around the world.

Although there were some variations across industries, chief investment officers overwhelmingly ranked those three drivers the highest (Exhibit 2).

Investors also clearly identify sustainable competitive advantage, followed by return on capital criteria (earnings and capital allocation) and management record, as key factors in deciding whether to buy or hold a financially healthy company (Exhibit 3). Perhaps surprisingly, the respondents don't rate

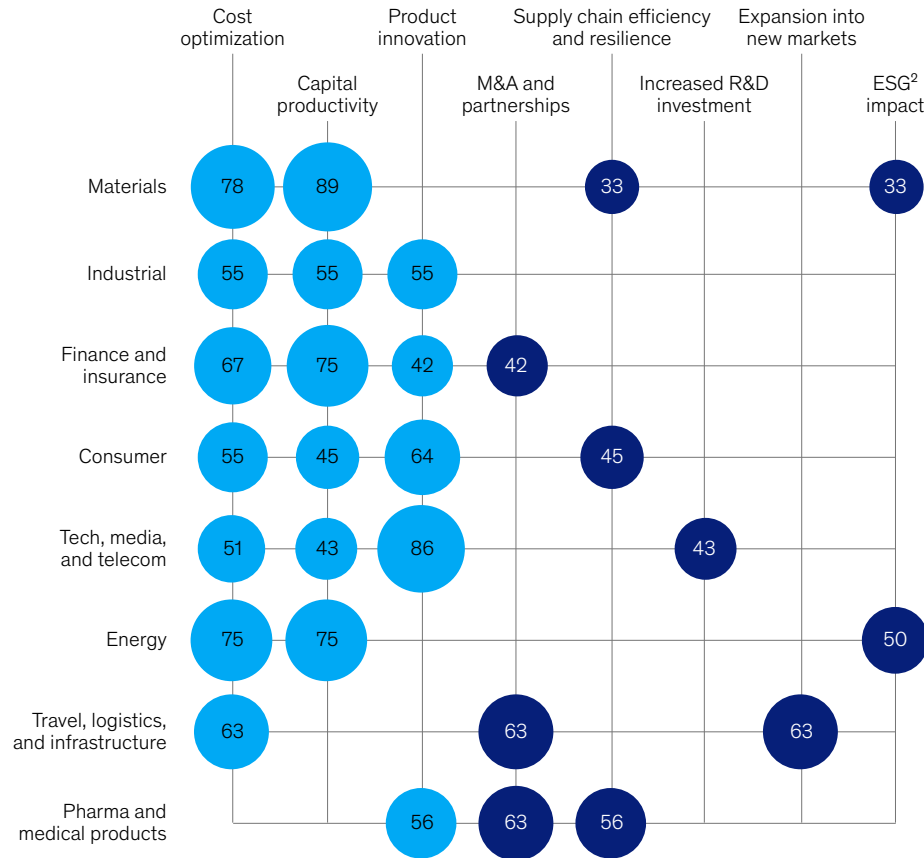
outperforming peers on growth as quite so essential—presumably, that would change for underperforming those peers. Nor were broader industry trends necessarily determinative.

These experienced investors understand that growth can be finicky, while fundamentals such as solid operations, a focus on competitive advantage, and effective management create value over the longer term.

Exhibit 2

**Surveyed investors tend to prioritize similar core principles, although there is some variation by industry.**

**Top drivers of long-term shareholder value creation, by industry, % of respondents (n = 19)<sup>1</sup>**



<sup>1</sup>Instruction: please indicate the 3 most important drivers of long-term shareholder value creation across industries in the current market environment.

<sup>2</sup>Environmental, social, and governance.

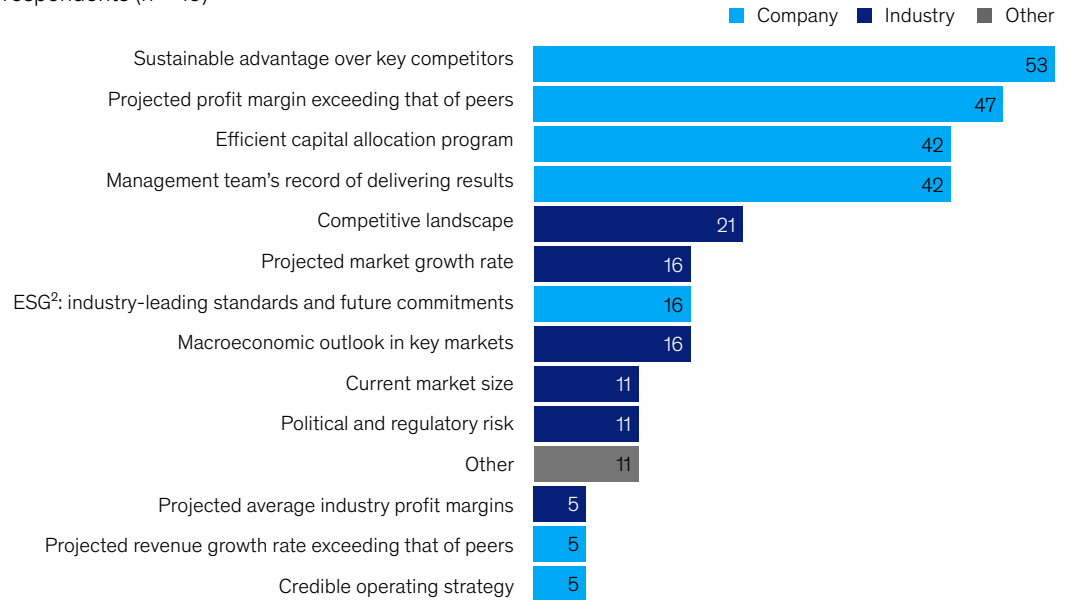
Source: McKinsey Investor Survey, 19 chief investment officers of leading investment funds, September 7–October 11, 2022

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Exhibit 3

**The criteria for buying and holding decisions are largely oriented to the long term.**

**Top criteria for buying or holding stock of financially healthy company in current market environment, % of respondents (n = 19)<sup>1</sup>**



<sup>1</sup>Question: What are the 3 most important criteria for buying or holding the stock of a financially healthy company in the current market environment?

<sup>2</sup>Environmental, social, and governance.

Source: McKinsey Investor Survey, 19 chief investment officers of leading investment funds, September 7–October 11, 2022

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Exhibit 4

**Surveyed investors favor CEOs who think holistically and move quickly.**

**Behaviors that CEOs should take to sustain long-term value creation, % of respondents (n = 19)<sup>1</sup>**



<sup>1</sup>Question: What top 3 behaviors should CEOs take to sustain long-term value creation?

Source: McKinsey Investor Survey, 19 chief investment officers of leading investment funds, September 7–October 11, 2022

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The other side of the coin is that respondents want CEOs to focus much less on short-term earnings and much more on resource reallocation. That starts with faster overall restructuring—selling the assets that don't align with the way that a company will create value over the long term (Exhibit 4).

More than 50 percent of chief investment officers surveyed also want management teams to think explicitly about the impact their strategy has on other stakeholders, such as employees and customers. This concern is entirely consistent with

understanding what makes for a strong brand and a sustainable competitive advantage. Indeed, it's telling that chief investment officers identified the very behaviors that mark a short-term approach as CEOs' biggest mistakes.

All told, the survey results reinforce what intrinsic investors have been making clear for years: companies should not prioritize short-term financial performance at the expense of long-term value creation.

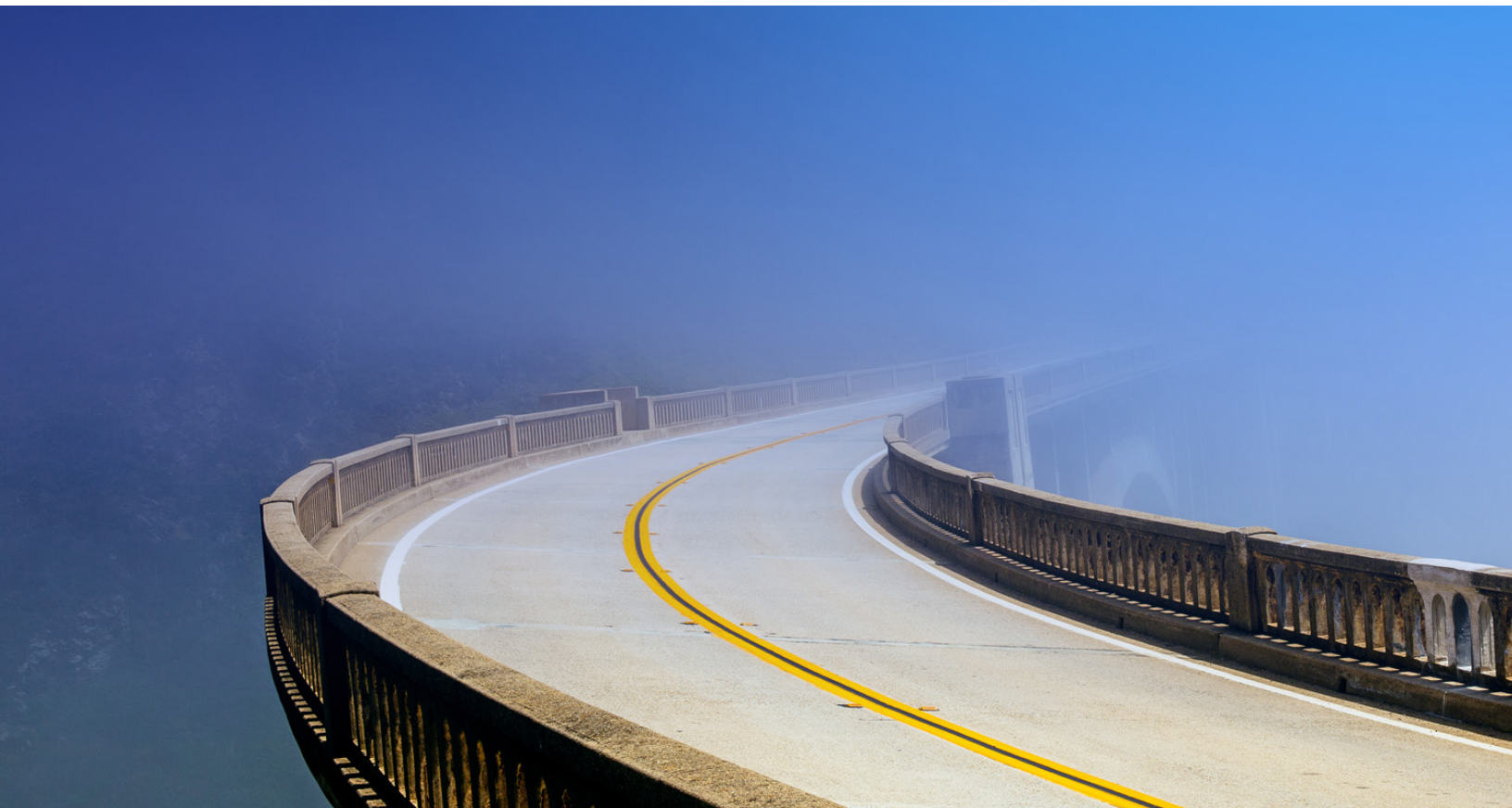
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# Performance edge: Investors hone their strategies for a new era

Institutional investors are rethinking their strategies across three areas of fundamental importance: purpose, portfolio construction, and proficiency.

*This article is a collaborative effort by Ismail Bel-Bachir, Sacha Ghai, Duncan Kauffman, Eser Keskiner, Robin Matthias, Elizabeth Skovira, and Marcos Tarnowski, representing views from McKinsey's Private Equity & Principal Investors Practice.*



**Times are changing** for institutional investors. After three decades of a stable economic order that helped facilitate strong returns and steady growth, institutional investors now face a new era marked by uncertainty, disruption, and radical shifts in public expectations of business and society. A global pandemic, a war in Europe, an energy crisis, disruptions in global supply chains, inflation, and growing social division are just a few signs of disorder. In this context, the course of future events has become much harder to foresee and returns may be more difficult to come by.

To understand how institutional investors are responding to the new circumstances, we collected perspectives from senior executives at 40 of the world's leading pension and sovereign wealth funds, which collectively manage \$10 trillion in assets. Our research uncovered insights into how institutional investors are navigating these external upheavals. As they aim to evolve their strategies in a far more unpredictable world, leading institutions are seeking to hone their “performance edge”

by focusing on purpose, portfolio construction, and proficiency.

### Interviewees: We're at a turning point

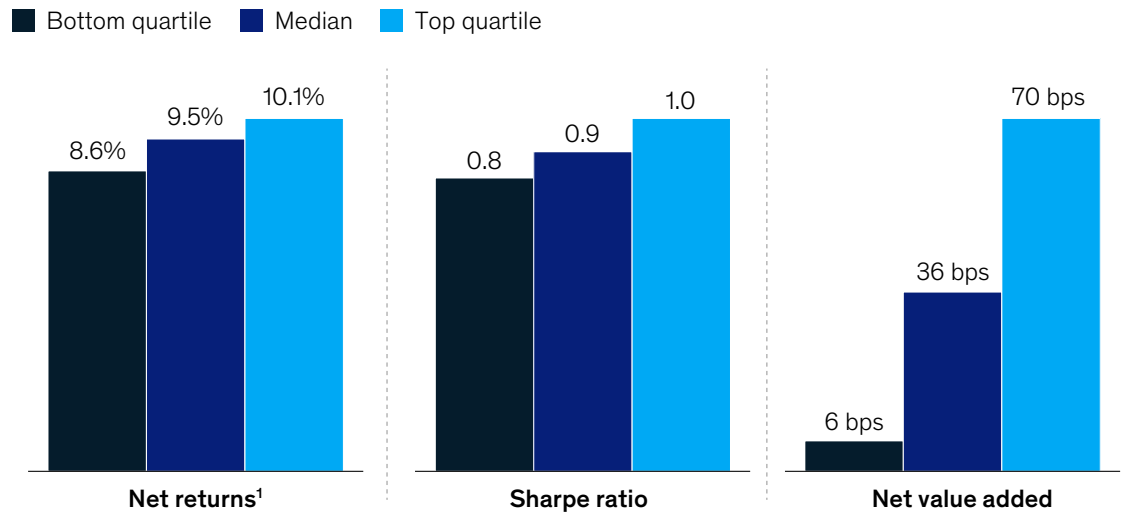
Past turning points have released forces that fundamentally shaped the subsequent era. Consider how the breakup of the Soviet Union ushered in three decades of peace, rising prosperity, and global economic integration that institutional investors have grown accustomed to. In that environment, the median institutional investor produced 9.5 percent in annual returns from 2012 to 2021 (exhibit).

Institutional investors we interviewed unanimously agree that the current environment is radically different from the global investment conditions of the previous three decades. Indeed, interviewees recognize shifts in five domains that are likely to define the current era: shifts in the world order, technology platforms, demographic forces, resource and energy systems, and capitalization.<sup>1</sup>

Exhibit

## Institutional investors delivered strong and stable returns between 2012 and 2021.

Performance of institutional investors, 2012–21



<sup>1</sup>Fund's total return net of costs.

<sup>2</sup>Net returns minus the fund's policy or benchmark return; the equivalent of returns from active management. Source: CEM Benchmarking

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<sup>1</sup> These themes were previously identified in McKinsey analysis. For more, see Chris Bradley, Jeongmin Seong, Sven Smit, and Jonathan Woetzel, “On the cusp of a new era?,” McKinsey Global Institute, October 20, 2022.

### **A new world order**

Changes in the world order are top of mind for institutional investor leaders globally. Ninety percent of interviewees cited these changes as a concern. The leader of a sovereign wealth fund said that the possibility of further geopolitical shocks has caused a rethinking of its investment horizon. Geopolitical tensions could also force institutions to divide their investment operations to limit information sharing. And many see an increase in economic regionalization.

### **Technology platforms**

Technology emerged as an area of focus for more than four-fifths of respondents. Institutional investors are beginning to incorporate technology into their investment processes. They have also become targets of cyberattacks. In 2022, there was a 243 percent increase in ransomware attacks, a 269 percent increase in crypto jacking, and a 94 percent increase in intrusion attempts.<sup>2</sup> This ongoing threat is causing leading institutions to bolster their risk management.

### **Demographic forces**

Demographics looms large, with 76 percent of respondents raising it as an area of focus. Declining social mobility, increasing economic inequality, political polarization, and aging populations have prompted a renewed focus on social issues as an investment criterion and a consideration in guiding investors' businesses.

### **Resource and energy systems**

By far the most salient challenge for interviewees is global resources and energy systems. All investors we spoke to said it was a defining issue for their investment strategies. The amount of capital expenditure required is vast: about \$275 trillion on physical assets for energy and land-use systems between 2021 and 2050.<sup>3</sup> Institutional investor executives anticipate that they will be expected to finance a significant proportion of this outlay.

Many interviewees expressed unease about the challenges of reaching net zero and of managing pressure from vocal stakeholders who object to the adoption of net-zero strategies. They are

constrained in their ability to accelerate the pace of change, particularly because the transition to net zero is riddled with challenges and nuances. For instance, one North American CEO pointed out that simply divesting from high-emitting assets is not an answer. What's more, many expressed worry about the green transition creating further strain on global energy markets.

### **Capitalization**

Last, three-quarters of interviewees named capitalization as a concern. Many described the rebalancing of the global balance sheet currently underway as a reset or a regime change. One North American chief investment officer considers this to be a near-term headwind for all asset classes but expects to persist with fundamental portfolio construction in the belief that the inflationary environment is here to stay.

### **Purpose, portfolio construction, and proficiency**

In this context, institutional investors will need to be faster, nimbler, and better at anticipating and responding to change. Our interviews revealed that investors are intensely focused on three areas.

#### **Purpose**

Institutional investors are built to deliver returns to their beneficiaries. But integrating environmental and social considerations is increasingly important. This change is highly visible as it relates to climate change, perhaps the world's biggest long-term problem. As one interviewee observed, sustainable investing and long-term investing are the same thing.

When it comes to social considerations, institutional investors are at different stages of developing their strategies, with some launching social-impact investment programs while others focus on monitoring social factors within their portfolios. As institutional investors have intensified their work on social considerations, diversity within their own ranks has also come into focus; more than a quarter of institutions covered in our research have committed to improving diversity in the industry.

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<sup>2</sup> *Mid-year update: 2022 SonicWall cyberthreat report*, SonicWall, August 2022.

<sup>3</sup> "The net-zero transition: What it would cost, what it could bring," McKinsey Global Institute, January 2022.



### Portfolio construction

The challenge for investors is to develop a distinctive and nimble approach to portfolio construction. Interviewees' short-term focus is to derisk their portfolios, paying attention to inflation-linked assets if they believe higher levels of inflation may be entrenched. Asset allocation is becoming more dynamic, with investors adjusting their exposures based on their expectations of medium-term trends.

As the macroeconomic environment becomes more challenging, many institutional investors are reexamining how they invest in private markets, paying more attention to their private-market exposures and the partners that manage them. More investors are jumping into early-stage investing, attracted by the value creation happening in the early stages of companies' development.

Institutional investors have diverging views on emerging markets. While some investors are responding to current conditions by pulling back from emerging markets, others are continuing to buy but are increasingly focused on each country's strengths and weaknesses.

### Proficiency

As institutional investors have grown in scale and scope, many have sought to increase internal capabilities and move away from working with external partners. However, institutional investors recognize they cannot internally hold the full range of capabilities needed to thrive in an uncertain world.

A major question is where to focus on building capabilities and where to partner. Many institutional investors are building expertise in select areas and partnering with other organizations to complement their core capabilities. Some are exploring ways to combine resources to create longer-term, more stable pools of capital.

Technology can help support decision making around investments, and interviewees indicated that they are embedding data and analytics into their investment and portfolio management processes. Several leading investors are embedding digital and analytics-enabled tools directly into investment teams, with the goal of bypassing the need for separate analytics teams.

In the face of increased reliance on technology, many investors are looking to shore up capabilities in risk management, including in critical areas such as cybersecurity. Many institutions are responding to increasing risk by incorporating cyber risk in their due-diligence processes and reassessing their organizational cybersecurity.

Industry-wide, collaboration between institutional investors can help drive consensus on policy matters such as standardized environmental, social, and governance (ESG) metrics. Institutional investors are also increasingly compelled to work with public-sector stakeholders on global issues such as decarbonization, an area in which governments will likely be unable to underwrite the necessary investment on their own.

These changes, particularly ones related to internalizing capabilities, necessarily affect investors' talent strategy. Professionals with skills in IT and responsible investing remain difficult to attract and retain. And many organizations are responding to macroeconomic challenges by looking for talent with skills such as partnership building and expertise across asset classes.

We believe this new era for institutional investors will create greater dispersion in investment outcomes. The institutional investors that evolve their purpose, their portfolios, and their proficiency to become more resilient, nimble, and responsive to the changing environment will have an edge in the next decade.

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The authors wish to thank Sara Bernow, Morgan Brokaw, Jonathan Christy, Antonino Piazza, Gregory Vainberg, and CEM Benchmarking for their contributions to this report.

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# The state of diversity in global private markets: 2023

Private equity firms and institutional investors have intensified their focus on gender and ethnic diversity, but the road ahead remains long.

*This report is a collaborative effort by Pontus Averstad, Fredrik Dahlqvist, Eitan Lefkowitz, Alexandra Nee, Gary Pinshaw, David Quigley, and Mohammed Shafi, representing views from McKinsey's Private Equity & Principal Investors Practice.*



**Over the course of 2022**, the global private markets industry experienced a slowdown in fundraising and dealmaking because of rising interest rates and other factors. Despite the rocky year, private equity and alternative investments (hereafter referred to as PE) remain significant in the global economy. The industry now manages \$11.7 trillion in assets, up from \$8.0 trillion the previous year.<sup>1</sup> The financial power of PE reinforces the importance of understanding the composition of its talent, particularly the professionals who decide how this capital is deployed.

Building on McKinsey's 2022 report, this year's report examines the diversity of talent in PE firms. Specifically, we examine the gender breakdown in every region in our study and look at ethnicity and race in the United States and Canada (for more on the research and analysis, see sidebar "About the study").

This year's report centers on the following core research objectives:

1. understand the current state of gender diversity globally, and ethnic and racial diversity in the US and Canada, for the PE industry—specifically, which types of firms are leading and lagging on diverse talent
2. how institutional investors influence the representation of diverse talent at PE firms, and the extent to which diversity matters to them
3. highlighting the specific challenges facing different minority groups and identifying actions that can increase the diversity of talent in PE firms

This report finds encouraging signs of progress in recent years. Diversity on investment committees (ICs) has ticked up, and the reporting of diversity metrics to institutional investors continues to grow.

Still, gaps remain, particularly regarding gender diversity in senior investing roles and uneven rates of progress for different ethnic and racial groups across roles and regions, and types of firms. Given the current pace of progress, it will be several decades

before the PE industry achieves gender parity at the principal and managing-director levels.

## **A global view on gender diversity in private equity and alternative investing**

There is a popular assumption that PE is dominated by men, but the evidence reveals a more nuanced reality. As we noted last year, PE firms have almost achieved gender parity globally at the entry level. At the end of 2022, 48 percent of all entry-level roles in PE were held by women.

However, women in PE are still underrepresented in leadership positions, with only 20 percent representation in managing-director roles (for more on job levels, see sidebar "Job levels in private equity"). As Kelley King, senior vice president and chief diversity, equity, and inclusion officer at HarbourVest, explained, "Identifying and attracting early-career diverse talent is not as challenging as finding later-career talent. As you ascend higher in the organization, the more patient and intentional firms need to be to reap the benefits of their DEI efforts."

### **Women are well represented in most noninvesting roles, but gender parity remains distant in investing and operating roles**

Disaggregating the data into investing, operating, and other noninvesting roles (the latter of which we will refer to as noninvesting roles) reveals that women hold only 33 percent of entry-level investing roles, compared with 44 percent of operating roles and 59 percent of noninvesting roles at that level. Women are also underrepresented at the managing-director level (L2), holding only 15 percent of managing-director-level investing roles (Exhibit 1).

Women in PE have made modest gains in investing roles over the course of 2022. The share of C-suite roles held by women globally increased by 3.5 percentage points over the past year to 17 percent at the end of 2022. Similarly, women's representation in post-MBA investing associate (L5) roles improved by three percentage points. However, gender diversity at the managing-director level remained constant.

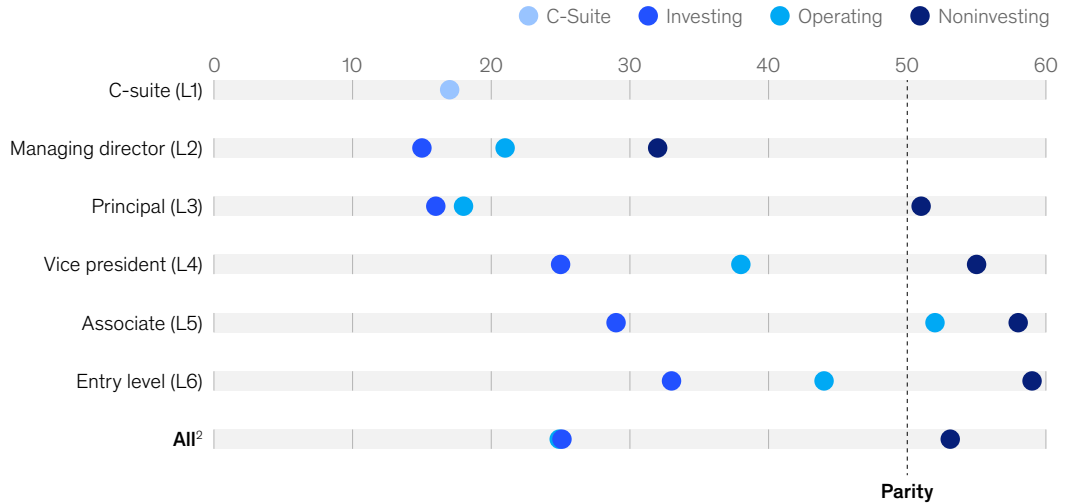
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<sup>1</sup> "McKinsey Global Private Markets Review: Private markets turn down the volume," McKinsey, March 21, 2023.

Exhibit 1

**Women are more represented in noninvesting roles than in operating and investing roles at every level.**

**Women’s representation by level and role type in private equity (PE) funds globally,<sup>1</sup>**  
 % of women in role and level



<sup>1</sup>Based on data provided by 41 PE firms. Responses cover more than 22,000 employees. Unique firm count by region: Americas = 37, Europe = 24, Asia–Pacific = 16.  
<sup>2</sup>Includes entry-level roles (L6) through managing-director roles (L2).

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Women in PE are slightly less represented in operating roles than in investing roles, with women holding only 25 percent of all operating roles. Notably, women in operations have achieved gender parity at the associate level (L5), with 52 percent of roles. However, gender diversity undergoes a steep decline at higher levels, with women holding just 21 percent of managing-director-level (L2) operating jobs.

Progress is generally cause for optimism, but if the pace of progress doesn’t accelerate, the path to gender parity in the industry will be long. At the current rate of progress, reaching gender parity in investing roles at the managing-director level (L2) would take more than six decades. Achieving gender parity at the principal level (L3) would take more than three decades (Exhibit 2).

While these numbers are sobering, the outlook is significantly brighter at the entry level. Based on current figures, the industry could reach gender parity at the analyst level (L6) and associate level (L5) within the next decade.

**Promotion rates: Women in investing face a longer road**

In demanding PE careers, women find themselves navigating a longer route to reach the same milestones as their male colleagues. At almost every level, women in investing roles are promoted at significantly lower rates than men. Globally, men in investing roles are about 50 percent more likely, on average, to be promoted than their female colleagues, a trend that persists across all levels in investing roles (Exhibit 3).



## About the study

In our **second** annual report, we build on the insights and findings from our inaugural report in 2022, as well as on prior McKinsey research on diversity in the workplace. This research explores diversity, equity, and inclusion in the global private-markets industry, with a focus on private equity and alternative investment firms (PE) and institutional investors. We aim to make this the largest study of gender diversity and ethnic and racial diversity in the global private markets industry.

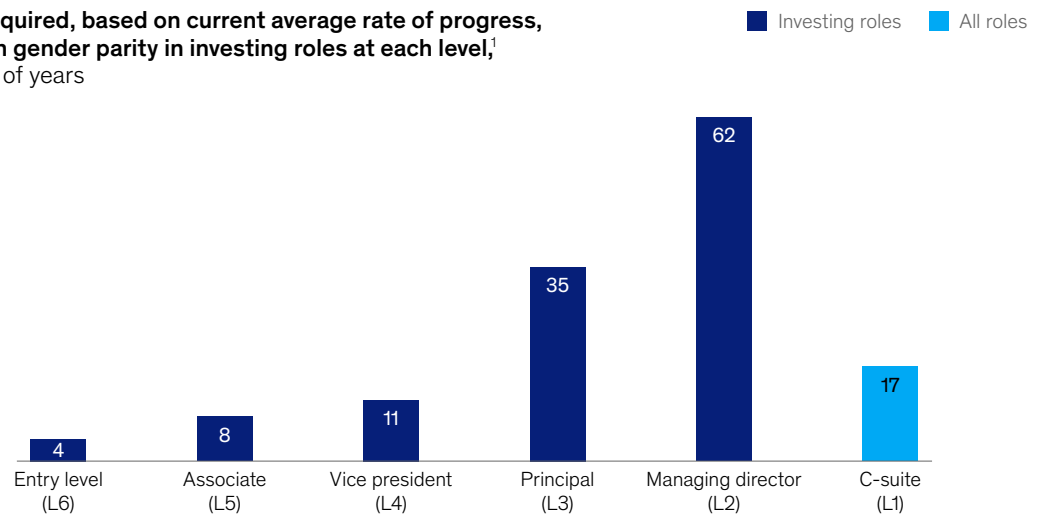
This year's survey covers 66 discrete PE firms and institutional investors around the world. We also conducted interviews with several industry leaders to supplement the survey data we received from their firms. Participating firms directly employ more than 60,000 people globally and range from megafirms with more than \$100 billion in assets under management (AUM) to smaller funds with less than \$5 billion in AUM. Collectively, participating PE firms manage more than \$6 trillion, and participating institutional investors manage more than \$5 trillion in AUM.

Given the limitations of data collection, this report largely focuses on gender diversity globally and ethnic and racial diversity in private market firms with offices in the United States and Canada. We recognize there are several other categories that contribute to employee diversity and hope to broaden the categories we examine in future research as private market firms collect more diversity data on their employee base.

Exhibit 2

### Depending on the level, global gender parity in investing roles may take multiple decades to achieve.

Time required, based on current average rate of progress, to reach gender parity in investing roles at each level,<sup>1</sup> number of years



<sup>1</sup>Based on the average progress rate achieved in 2021 and 2022 and on women's representation as a percentage of total investing roles in each level at the end of 2022. Based on data provided by 66 PE firms. Responses cover more than 60,000 employees.

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The largest gap affects promotions into the principal level (L3), with men 2.75 times more likely than women to be promoted. One contributor to this disparity may be limited sponsorship and mentorship for women at the vice president (VP) level. As the head of talent for a North American PE fund put it, “At that [middle] level is where we find a number of ethnic minorities and women who have really felt like the levels they are at have a sticky floor. They found that it’s really hard to get that next promotion. They feel left out. They haven’t received the kind of mentorship and the kind of apprenticeship that they’re really going to need or the sponsorship to get promoted.”

The road to meaningful progress will likely be long. However, there’s a bright spot: the promotion gap at the managing-director level (L2) shrank in 2022.

**Significant differences in representation between leading and lagging firms**

Some firms have made noteworthy strides on the diversity of their talent pool, so much so that the industry’s global average of women in 15 percent

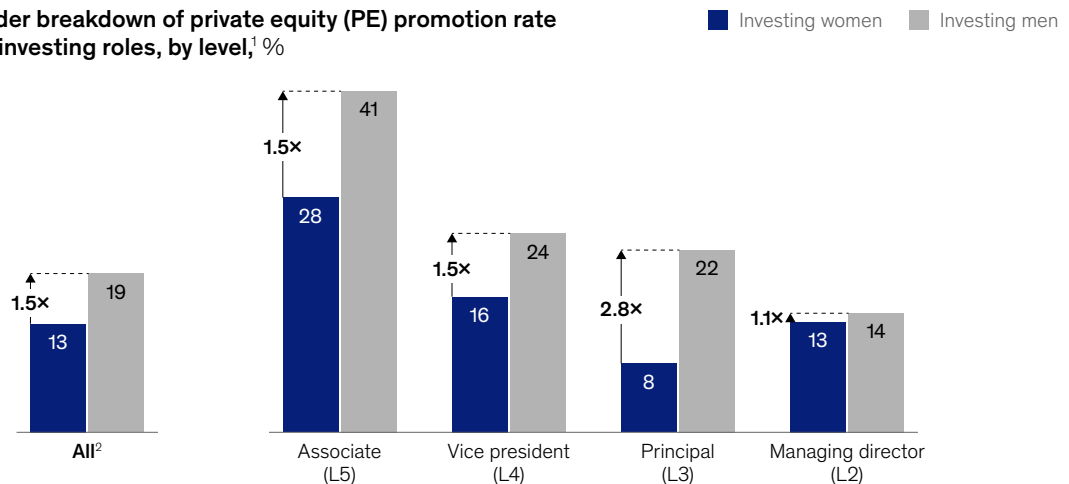
of investing managing-director roles looks paltry by comparison. Leading firms had women in 45 percent of managing-director (L2) roles as the end of 2022. These firms also had significantly higher proportions of women at every level and overall had women in 38 percent of their investing roles, compared with the global average of 25 percent.

Interestingly, firms that were leaders in gender diversity (as indicated by relatively high proportions of women in managing-director roles) also retained women at higher rates than the industry average. However, firms that lagged on gender diversity showed significantly higher attrition in 2022 among women in investing. These firms in our sample did not have women in managing-director (L2) investing roles and had only 17 percent women in investing roles overall compared to the 25 percent global benchmark. Furthermore, these firms’ attrition rates for women in investing were 1.7 times higher, at 27 percent, than the global average over the course of 2022 (Exhibit 4).

Exhibit 3

**At every level, women in investing roles are less likely than men to be promoted.**

**Gender breakdown of private equity (PE) promotion rate into investing roles, by level,<sup>1</sup> %**



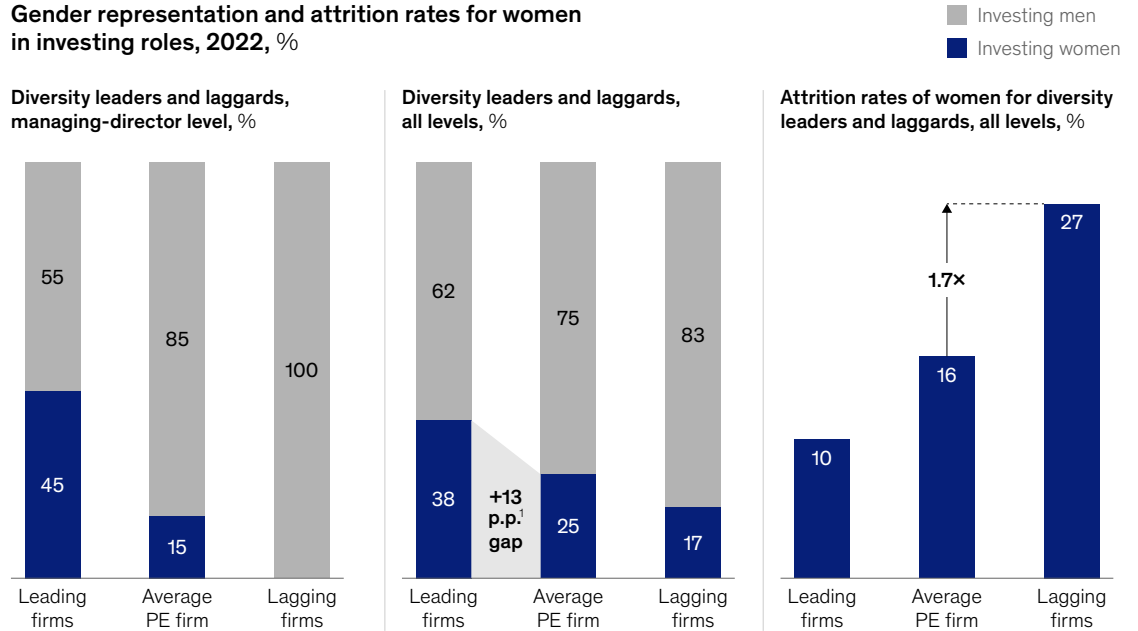
<sup>1</sup>Based on data provided by 41 PE firms. Responses cover more than 22,000 employees. Unique firm count by region: Americas = 37, Europe = 24, Asia-Pacific = 16. Promotion rates are calculated by dividing the number of people promoted into the level during the year divided by the total number of employees at the lower level at the beginning of the year. Promotion rate is not calculated when the number of employees at the lower level is zero.  
<sup>2</sup>Includes investing roles from the associate (L5) to the managing director (L2) level.

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Exhibit 4

## Globally, firms that lead in gender diversity at L2 also beat the industry benchmark for all investing roles.

Gender representation and attrition rates for women in investing roles, 2022, %



Note: Based on data provided by 41 private equity firms. Responses cover more than 22,000 employees. Unique firm count by region: Americas = 37, Europe = 24, Asia-Pacific = 16. Industry leaders are defined as firms within the top 10% in terms of women's representation in investing roles at L2. Industry laggards are defined as firms within the bottom 10% in terms of women's representation in investing roles at the managing-director level.  
<sup>1</sup>Percentage points.

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## Job levels in private equity

**The language** we use to classify jobs in private equity (PE) has not changed from last year's. The six levels we identify apply to PE jobs in investing, operational, and other noninvesting functions. For most of these levels, we include multiple possible job titles. In descending order of seniority, the roles are as follows:

L1. C-level executives or fund heads. We refer to this level as the C-level or C-suite.

L2. Managing directors or partners. We refer to jobs at this level as managing directors.

L3. Principals, directors, or senior vice presidents. We refer to jobs at this level as principals.

L4. Vice presidents or senior managers. We refer to jobs at this level as VPs.

L5. Associates or managers. We refer to jobs at this level as associates.

L6. Entry-level roles.

For the sake of simplicity, we will refer to each level with only one title.

For investing roles, our findings suggest a correlation between the representation of women at the top and higher overall gender representation, as well as between the lack of women at the top and their firms' ability to retain women at all levels of investing roles.

Our findings on gender diversity over time also highlight the feasibility of substantial progress when decision makers deploy effective strategies. Indeed, the results of our study show that not all PE firms are equal when it comes to cultures that support diverse talent.

**Different regions have different timelines to gender parity**

The timelines to achieving gender parity vary by region. For instance, despite advances, Europe still faces significant challenges related to women's representation at senior levels. At its current pace, Europe would require more than six decades to reach gender parity at senior levels.

By contrast, based on the rate of recent progress, the Americas are the furthest from achieving gender

parity at middle and junior levels for investing roles. The situation is notably different in the Asia–Pacific region, which has done the most to close the gender gap at middle and senior levels recently (Exhibit 5).

A concerning trend has emerged over the past two years: gender representation has seen a minor decrease in the Asia–Pacific region at the associate level (L5). Although this decline starts from a relatively high base, it indicates the need for ongoing efforts to maintain a diverse talent pipeline that can help the industry achieve gender parity.

**Ethnic and racial diversity in private equity**

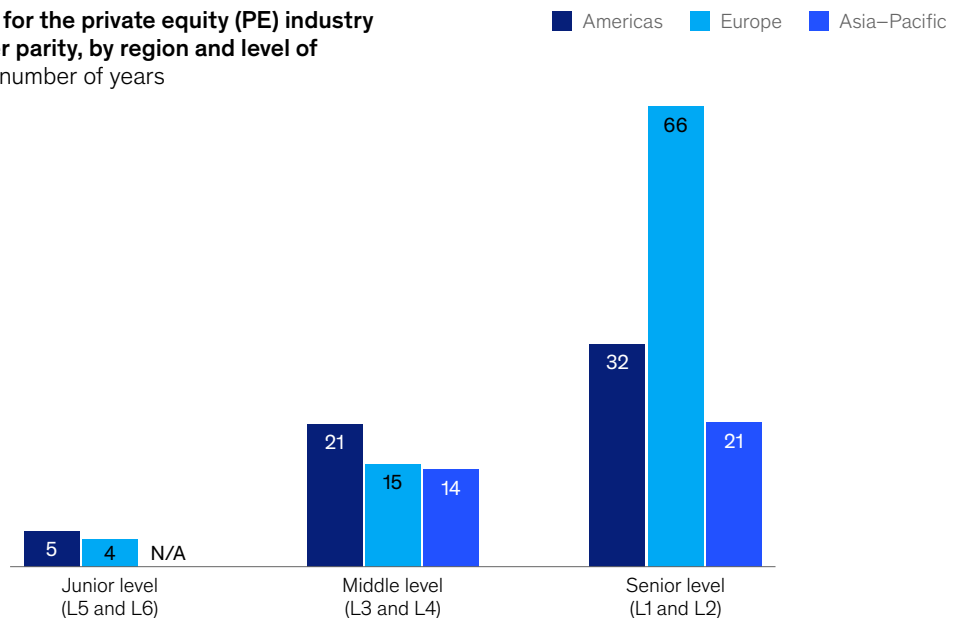
Consistent with our past findings, ethnic and racial minorities in PE face similar underrepresentation as women. At nearly every level, investing roles have lower ethnic and racial diversity than noninvesting and operating-partner roles.

Our research data from the United States and Canada shows that ethnic and racial minorities

Exhibit 5

**The time it will take for private equity to reach gender parity varies by region.**

**Length of time for the private equity (PE) industry to reach gender parity, by region and level of investing role,<sup>1</sup> number of years**



<sup>1</sup>Based on the average progress achieved in 2021 and 2022 and on women's representation as a percentage of total investing roles in each level at the end of 2022. Based on data provided by 66 PE firms. Responses cover more than 60,000 employees. Unique firm count by region: Americas = 37, Europe = 24, Asia-Pacific = 16.

represent only 20 percent of managing-director-level investing professionals (Exhibit 6). For context, people who identify as ethnic and racial minorities account for 30 percent of the Canadian population and 41 percent of the US population.<sup>2</sup> However, we found positive progress in ethnic and racial diversity in ICs in 2022. Ethnic and racial minorities represented 18 percent of investment committee members, nearly matching the ethnic and racial diversity of managing directors (L2) that year.

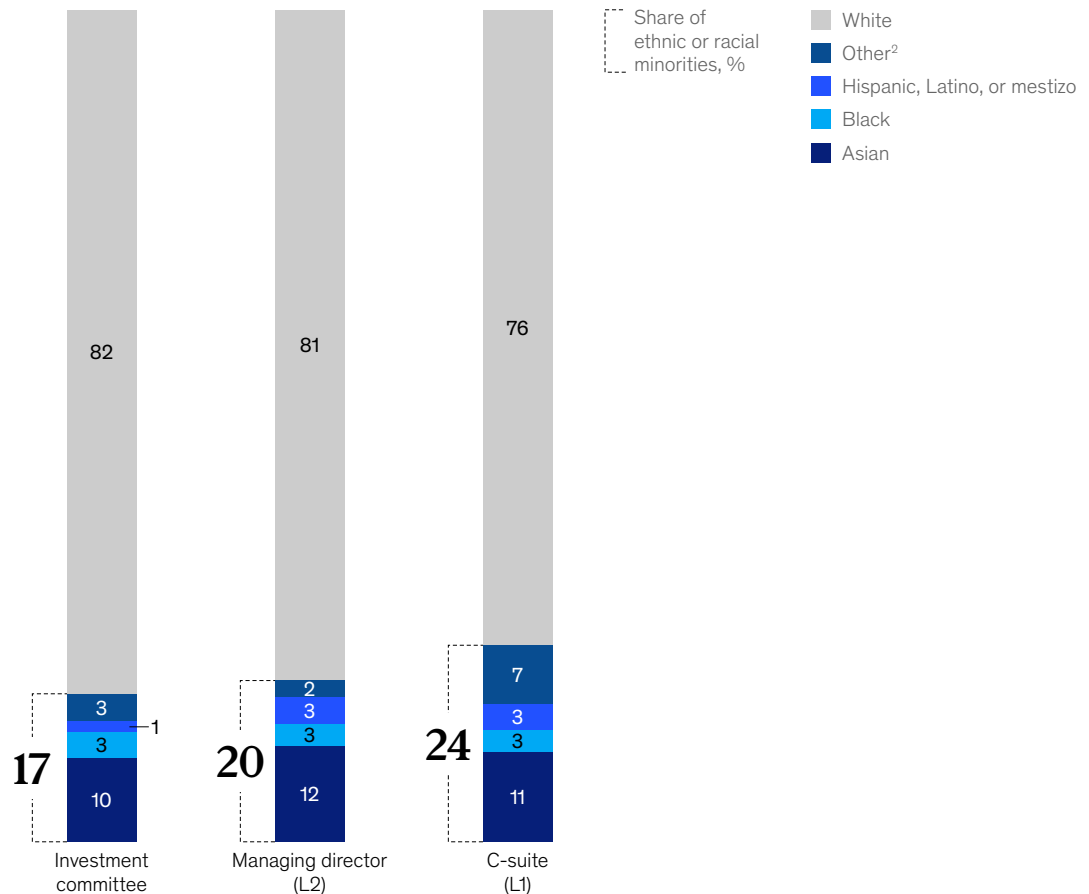
The improvement in the diversity of talent in investment committees over the course of 2022 may be the result of new requirements for PE firms to disclose C-suite- and IC-level diversity data to prospective investors. The chief HR officer of a midsize PE firm headquartered in North America referred to this as “a standard part of the due-diligence questionnaire these days.”

<sup>2</sup> “QuickFacts: United States population estimates,” US Census Bureau, July 1, 2022; “The Canadian census: A rich portrait of the country’s religious and ethnocultural diversity,” Statistics Canada, October 26, 2022.

Exhibit 6

### As of 2022, the makeup of investment committees in the United States and Canada more closely reflect the diversity of managing directors.

#### Ethnic and racial composition of private equity (PE) senior leadership in the US and Canada,<sup>1</sup> %



<sup>1</sup>Based on data provided by 33 PE firms. Responses cover more than 14,000 employees in the US and Canada. Benchmark only includes data for the US and Canada.

<sup>2</sup>Includes multiple ethnicities and races, as well as indigenous people.

Investment professionals who identify as White held 70 percent of all investing roles and 80 percent of managing-director roles. As of 2022, White men made up the majority of White PE professionals at 79 percent, with 86 percent at the managing-director level. By contrast, women who identify as ethnic and racial minorities were the least represented group among investment professionals across all levels. White professionals lead promotion rates into every level except principal (L3). The difference in promotion is most drastic at the managing-director level (L2), in which White professionals were more than 2.3 times more likely to be promoted than any other race or ethnicity. And once they make it to the top, White professionals has the lowest rates of attrition, trailing only Hispanic and Latino investing professionals in attrition rates at the principal level (L3) and managing-director level (L2).

**Firms with more ethnic and racial diversity at the top tend to have more-diverse talent pools**

Not all PE firms have struggled to attract and develop talent from ethnic and racial minorities. Leading firms have reached or are nearing representative levels, with 42 percent of investing talent identifying as ethnic or racial minorities.

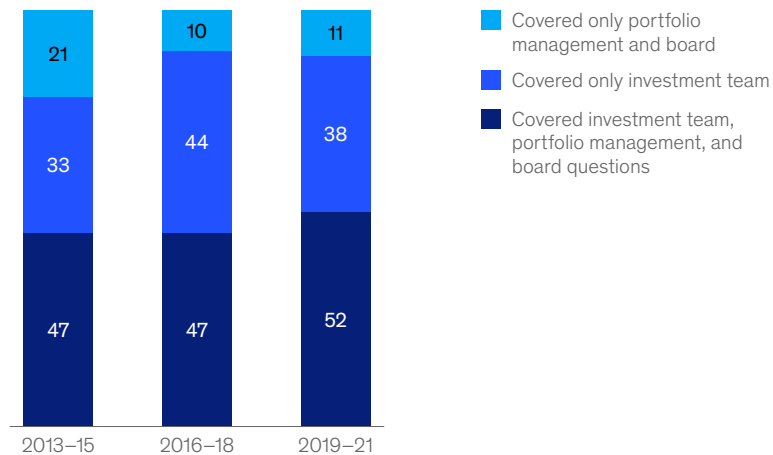
Lagging firms, on the other hand, have almost no ethnic and racial diversity at senior levels. These challenges at the top are reflected throughout the organization, with only 23 percent of investing professionals at lagging firms identifying as ethnic and racial minorities.

Firms that lead the industry in ethnic and racial diversity have demonstrated that significant progress is possible, but there is still work to be

Exhibit 7

**Approximately half of firms provide diversity data about their investing team, portfolio company, C-suite, and board.**

**Scope of diversity, equity, and inclusion (DEI) questions asked by institutional investors to private equity firms during fundraising,<sup>1</sup> % of firms asked for DEI metrics**



Note: Figures do not sum to 100%, because of rounding.  
<sup>1</sup>Share of PE firms reporting DEI metrics calculated by dividing count of PE firms that have shared DEI metrics during fundraising within year of reference or in years prior by total count of reported PE firms that have reported DEI metrics to institutional investors in the 2013-21 period. Question: "For your last fundraise, did you include DEI metrics of your investment team, portfolio boards, or portfolio management for this segment?"

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# Given the current pace of progress, it will be several decades before the PE industry achieves gender parity at the principal and managing-director levels.

done to make PE offices in the United States and Canada more representative. Black and Hispanic professionals remain underrepresented, even at firms that lead on ethnic and racial diversity. Fourteen percent of the US population is Black, and 19 percent is Hispanic,<sup>3</sup> but even at leading firms, only 8 percent of managing directors are Black, and 9 percent are Hispanic.

## **Institutional investors are asking more about DEI metrics**

When making funding decisions, institutional investors increasingly take PE firms' DEI practices into account.

Institutional investors are broadening their view of DEI beyond the investment team and now increasingly ask about DEI metrics within portfolio companies and their boards (Exhibit 7). This growing interest from institutional investors has encouraged PE firms to systematically track and report on these metrics, fueling momentum toward diversity and inclusion in the industry. As a partner at a North American PE fund put it, "Data requests from LPs on diversity and inclusion have gone from zero in the 2000s to everyone asking about it today."

Notably, some institutional investors track PE firms' year-over-year improvements in diversity and inclusion as part of their DEI assessments. Forward-looking institutional investors have started to move beyond simply tracking DEI metrics and are beginning to set minimum thresholds on some metrics. For instance, one institutional investor in our sample requires PE firms to meet minimum racial- and gender-diversity thresholds before the institutional investor considers making an investment.

## **Structural barriers for PE firms owned by ethnic and racial minorities and women**

Institutional investors are continuing to gather data on diversity inclusion. But are their allocations consistent with their stated priorities?

Institutional investors that participated in last year's study said they would be willing to give more capital to more-diverse deal teams.<sup>4</sup> However, institutional investors face challenges in making that promise a reality. As of 2021, PE firms owned by ethnic and racial minorities and women managed only 6 percent of total AUM in PE.<sup>5</sup> If diversity is high on institutional investors' priority list, why don't minority-owned funds receive more capital?

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<sup>3</sup> "QuickFacts: United States population estimates," July 1, 2022.

<sup>4</sup> Ibid.

<sup>5</sup> *Knights diversity of asset managers research series: Industry*, Knight Foundation, December 2021.

The hurdle for minority- and women-owned funds is not their track record or the investing team's experience. The challenges are structural and make it harder for institutional investors to allocate to these firms. For instance, compared with their competitors, minority- and women-owned firms are smaller and newer on average. In the current macroeconomic environment, institutional investors are relying more on existing long-term relationships with general partners to weather the cycle, leaving even fewer slots for these firms to compete over. To connect with these firms, institutional investors would have to go through brokers or adjust their minimum allocation rules to directly invest in smaller raises.

As institutional investors continue to shape the future of private equity, their influence will be vital in ensuring that DEI remains top of mind. Through thoughtful capital allocation and continued focus on DEI metrics, institutional investors have the power to drive meaningful change in the sector, making PE more inclusive, more diverse, and ultimately more successful.

### **From aspiration to action: Tangible steps toward a more diverse future**

Our study highlights that to achieve a more diverse, equitable, and inclusive industry, firms require additional internal actions and practices as well as external pressures. Strategies to retain and promote

diverse talent within PE firms would need to coexist with a collaborative commitment from institutional investors to demand DEI metrics and support women- and minority-owned funds. Our discussion focuses on specific actions and regional considerations that can accelerate the path to greater diversity of talent within investing roles in private markets globally.

### **Must-haves: A focus on retaining diverse talent and practices that accelerate the path to equity**

PE firms have made initial progress in diversifying their entry-level talent pipelines. To establish a more inclusive culture and move toward gender parity, those efforts would need to extend to the senior ranks. It's important for practices that promote diversity and inclusion to be embedded in every level of the organization. DEI should not be seen as just a recruitment initiative.

Key practices to implement include the following:

- analyzing attrition and promotion rates by gender, ethnicity, and race where possible, along with other measures of diversity, to shed light on firms' effectiveness in retaining and promoting diverse talent
- developing intentional sponsorship and mentorship programs that can guide diverse talent, especially in midlevel roles

**Globally, men in investing roles are about 50 percent more likely, on average, to be promoted than their female colleagues.**

- establishing employee resource groups (ERGs) for diverse talent to offer safe spaces for interaction, discussion, and mutual support
- implementing more flexible HR policies, such as remote work, to cast a wider net for talent and improve inclusion for professionals from diverse backgrounds
- hosting unconscious-bias and conscious-inclusion training to minimize the impact of unconscious prejudices on decision-making processes
- creating intentional on-ramps and off-ramps for employees as they transition to and from parental leave or extended time off to help normalize these journeys

These initiatives go beyond recruitment and are crucial in building an inclusive environment that not only welcomes diverse team members but also enables them to flourish and ascend the ranks. By committing to these practices, PE firms can nurture diversity throughout their organizations, from the entry level to top leadership.

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The road toward equity in PE is long, but a continued focus on actions that could accelerate progress can put the industry's aspirations within reach. Institutional investors can continue to reinforce the industry's commitment to DEI, and by acting on these commitments, PE firms can hone the edge that comes with diversity.

**Pontus Averstad** and **Fredrik Dahlqvist** are senior partners in McKinsey's Stockholm office; **Eitan Lefkowitz** is a consultant in the New Jersey office; **Alexandra Nee** is a partner in the Washington, DC, office, where **Mohammed Shafi** is a consultant; **Gary Pinshaw** is a senior partner in the Sydney office; and **David Quigley** is a senior partner in the New York office.

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## Chapter 2

# AI for investors

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What every CEO should know about generative AI

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Four essential questions for boards to ask about generative AI

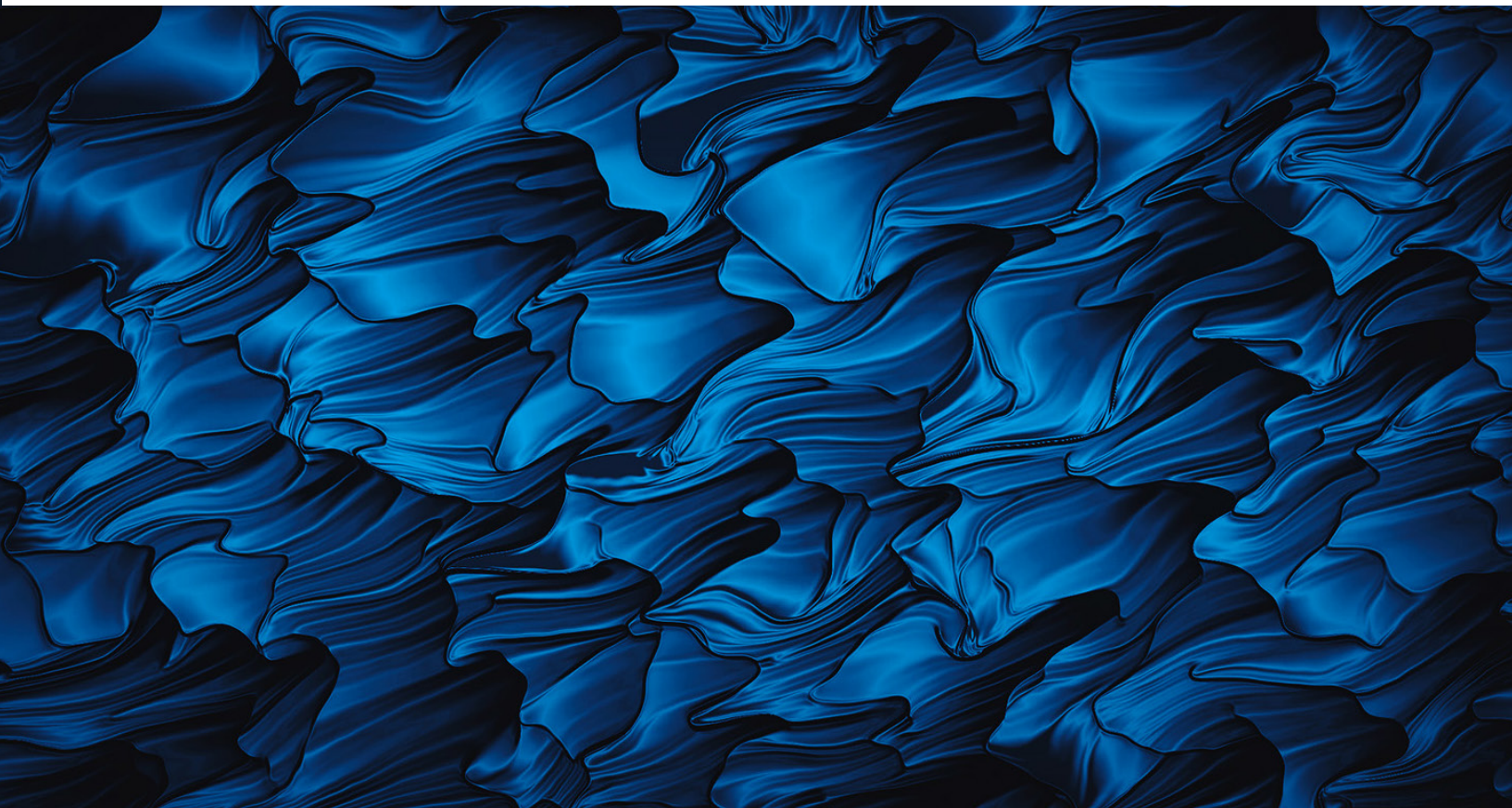
**51**

Applied AI: Six growth considerations for private markets

# What every CEO should know about generative AI

Generative AI is evolving at record speed while CEOs are still learning the technology's business value and risks. Here, we offer some of the generative AI essentials.

*This article is a collaborative effort by Michael Chui, Roger Roberts, Tanya Rodchenko, Alex Singla, Alex Sukharevsky, Lareina Yee, and Delphine Zurkiya, representing views from the McKinsey Technology Council and QuantumBlack, AI by McKinsey, which are both part of McKinsey Digital.*





**Amid the excitement** surrounding generative AI since the release of ChatGPT, Bard, Claude, Midjourney, and other content-creating tools, CEOs are understandably wondering: is this tech hype or a game-changing opportunity? And if it is the latter, what is the value to my business?

The public-facing version of ChatGPT reached 100 million users in just two months. It democratized AI in a manner not previously seen while becoming by far the fastest-growing app ever. Its out-of-the-box accessibility makes generative AI different from all AI that came before it. Users don't need a degree in machine learning to interact with or derive value from it; nearly anyone who can ask questions can use it. And, as with other breakthrough technologies such as the personal computer or iPhone, one generative AI platform can give rise to many applications for audiences of any age or education level and in any location with internet access.

All of this is possible because generative AI chatbots are powered by foundation models, which are expansive neural networks trained on vast quantities of unstructured, unlabeled data in a variety of formats, such as text and audio. Foundation models can be used for a wide range of tasks. In contrast, previous generations of AI models were often "narrow," meaning they could perform just one task, such as predicting customer churn. One foundation model, for example, can create an executive summary for a 20,000-word technical report on quantum computing, draft a go-to-market strategy for a tree-trimming business, and provide five different recipes for the ten ingredients in someone's refrigerator. The downside to such versatility is that, for now, generative AI can sometimes provide less accurate results, placing renewed attention on AI risk management.

With proper guardrails in place, generative AI can not only unlock novel use cases for businesses but also speed up, scale, or otherwise improve existing ones. Imagine a customer sales call, for example. A specially trained AI model could suggest upselling opportunities to a salesperson, but until now those were usually based only on static customer data obtained before the start of the call, such as demographics and purchasing patterns.

A generative AI tool might suggest upselling opportunities to the salesperson in real time based on the actual content of the conversation, drawing from internal customer data, external market trends, and social media influencer data. At the same time, generative AI could offer a first draft of a sales pitch for the salesperson to adapt and personalize.

The preceding example demonstrates the implications of the technology on one job role. But nearly every knowledge worker can likely benefit from teaming up with generative AI. In fact, while generative AI may eventually be used to automate some tasks, much of its value could derive from how software vendors embed the technology into everyday tools (for example, email or word-processing software) used by knowledge workers. Such upgraded tools could substantially increase productivity.

CEOs want to know if they should act now—and, if so, how to start. Some may see an opportunity to leapfrog the competition by reimagining how humans get work done with generative AI applications at their side. Others may want to exercise caution, experimenting with a few use cases and learning more before making any large investments. Companies will also have to assess whether they have the necessary technical expertise, technology and data architecture, operating model, and risk management processes that some of the more transformative implementations of generative AI will require.

The goal of this article is to help CEOs and their teams reflect on the value creation case for generative AI and how to start their journey. First, we offer a generative AI primer to help executives better understand the fast-evolving state of AI and the technical options available. The next section looks at how companies can participate in generative AI through four example cases targeted toward improving organizational effectiveness. These cases reflect what we are seeing among early adopters and shed light on the array of options across the technology, cost, and operating model requirements. Finally, we address the CEO's vital role in positioning an organization for success with generative AI.



Excitement about generative AI is palpable, and C-suite executives rightfully want to move ahead with thoughtful and intentional speed. We hope this article offers business leaders a balanced introduction into the promising world of generative AI.

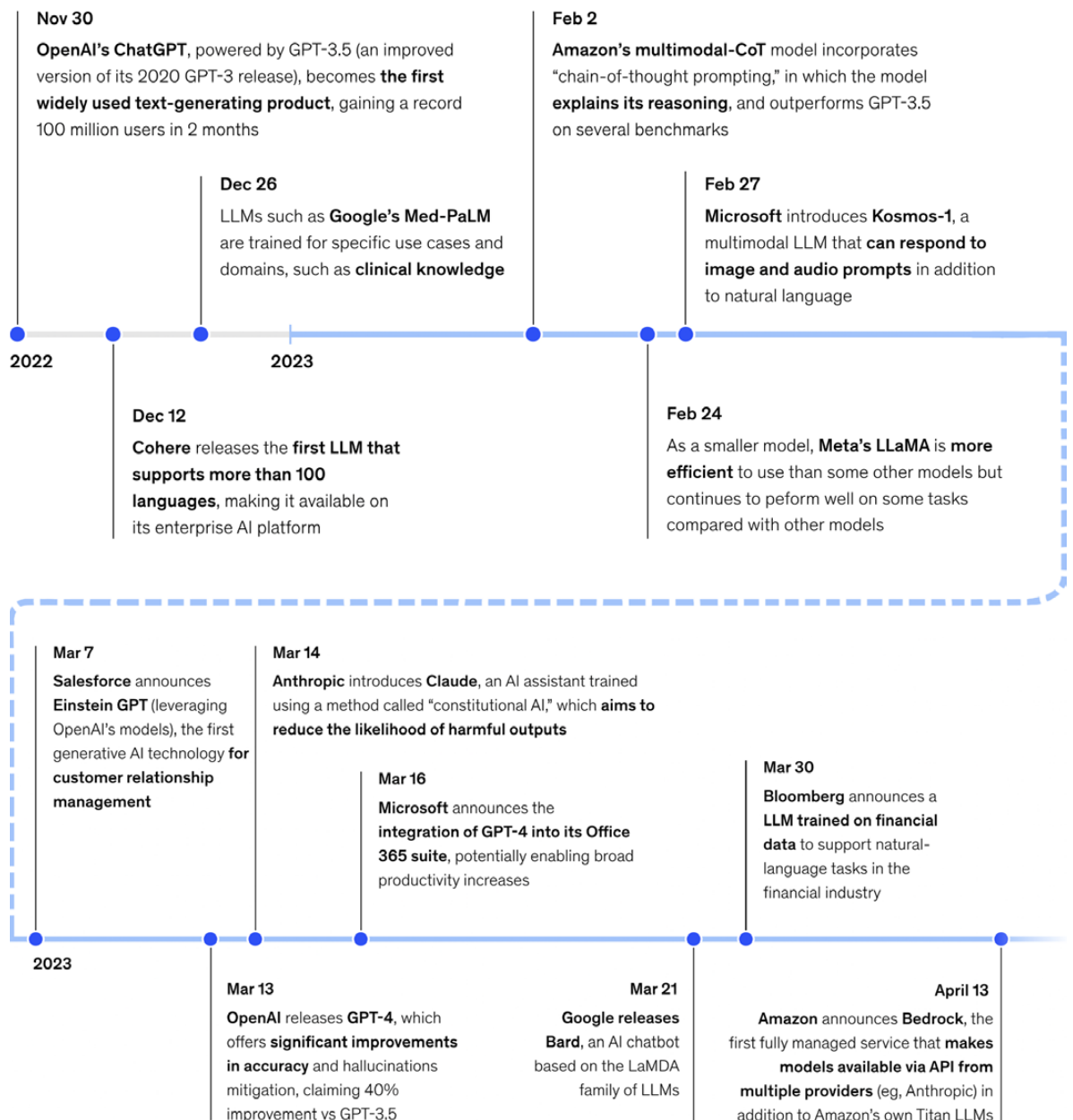
## A generative AI primer

Generative AI technology is advancing quickly (Exhibit 1). The release cycle, number of start-ups, and rapid integration into existing software applications are remarkable. In this section, we will discuss the breadth of generative AI

Exhibit 1

### Generative AI has been evolving at a rapid pace.

Timeline of some of the major large language model (LLM) developments in the months following ChatGPT's launch



applications and provide a brief explanation of the technology, including how it differs from traditional AI.

### **More than a chatbot**

Generative AI can be used to automate, augment, and accelerate work. For the purposes of this article, we focus on ways generative AI can enhance work rather than on how it can replace the role of humans.

While text-generating chatbots such as ChatGPT have been receiving outside attention, generative AI can enable capabilities across a broad range of content, including images, video, audio, and computer code. And it can perform several functions in organizations, including classifying, editing, summarizing, answering questions, and drafting new content. Each of these actions has the potential to create value by changing how work gets done at the activity level across business functions and workflows. The following are some examples.

#### *Classify*

- A fraud-detection analyst can input transaction descriptions and customer documents into a generative AI tool and ask it to identify fraudulent transactions.
- A customer-care manager can use generative AI to categorize audio files of customer calls based on caller satisfaction levels.

#### *Edit*

- A copywriter can use generative AI to correct grammar and convert an article to match a client's brand voice.
- A graphic designer can remove an outdated logo from an image.

#### *Summarize*

- A production assistant can create a highlight video based on hours of event footage.
- A business analyst can create a Venn diagram that summarizes key points from an executive's presentation.

#### *Answer questions*

- Employees of a manufacturing company can ask a generative AI-based "virtual expert" technical questions about operating procedures.
- A consumer can ask a chatbot questions about how to assemble a new piece of furniture.

#### *Draft*

- A software developer can prompt generative AI to create entire lines of code or suggest ways to complete partial lines of existing code.
- A marketing manager can use generative AI to draft various versions of campaign messaging.

As the technology evolves and matures, these kinds of generative AI can be increasingly integrated into enterprise workflows to automate tasks and directly perform specific actions (for example, automatically sending summary notes at the end of meetings). We already see tools emerging in this area.

#### **How generative AI differs from other kinds of AI**

As the name suggests, the primary way in which generative AI differs from previous forms of AI or analytics is that it can generate new content, often in "unstructured" forms (for example, written text or images) that aren't naturally represented in tables with rows and columns (see sidebar "Glossary" for a list of terms associated with generative AI).

The underlying technology that enables generative AI to work is a class of artificial neural networks called foundation models. Artificial neural networks are inspired by the billions of neurons that are connected in the human brain. They are trained using deep learning, a term that alludes to the many (deep) layers within neural networks. Deep learning has powered many of the recent advances in AI.

However, some characteristics set foundation models apart from previous generations of learning models. To start, they can be trained on extremely

## Glossary

**Application programming interface (API)** is a way to programmatically access (usually external) models, data sets, or other pieces of software.

**Artificial intelligence (AI)** is the ability of software to perform tasks that traditionally require human intelligence.

**Deep learning** is a subset of machine learning that uses deep neural networks, which are layers of connected “neurons” whose connections have parameters or weights that can be trained. It is especially effective at learning from unstructured data such as images, text, and audio.

**Fine-tuning** is the process of adapting a pretrained foundation model to perform better in a specific task. This entails a relatively short period of training on a labeled data set, which is much smaller than the data set the model was initially trained on. This additional training allows the model to learn and adapt to the nuances, terminology, and specific patterns found in the smaller data set.

**Foundation models (FM)** are deep learning models trained on vast quantities of unstructured, unlabeled data that can be used for a wide range of tasks out of the box or adapted to specific tasks through fine-tuning. Examples of these models are GPT-4, PaLM, DALL·E 2, and Stable Diffusion.

**Generative AI** is AI that is typically built using foundation models and has capabilities that earlier AI did not have, such as the ability to generate content. Foundation models can also be used for nongenerative purposes (for example, classifying user sentiment as negative or positive based on call transcripts) while offering significant improvement over earlier models. For simplicity, when we refer to generative AI in this article, we include all foundation model use cases.

**Graphics processing units (GPUs)** are computer chips that were originally developed for producing computer graphics (such as for video games) and are also useful for deep-learning applications. In contrast, traditional machine learning and other analyses usually run on **central processing units (CPUs)**, normally referred to as a computer’s “processor.”

**Large language models (LLMs)** make up a class of foundation models that can process massive amounts of unstructured text and learn the relationships between words or portions of words, known as tokens. This enables LLMs to generate natural-language text, performing tasks such as summarization or knowledge extraction. GPT-4 (which underlies ChatGPT) and LaMDA (the model behind Bard) are examples of LLMs.

**Machine learning (ML)** is a subset of AI in which a model gains capabilities after it is trained on, or shown, many example data points. Machine-learning algorithms detect patterns and learn how to make predictions and recommendations by processing data and experiences, rather than by receiving explicit programming instruction. The algorithms also adapt and can become more effective in response to new data and experiences.

**Machine-learning operations (MLOps)** refers to the engineering patterns and practices to scale and sustain AI and ML. It encompasses a set of practices that span the full ML life cycle (data management, development, deployment, and live operations). Many of these practices are now enabled or optimized by supporting software (tools that help to standardize, streamline, or automate tasks).

**Prompt engineering** refers to the process of designing, refining, and optimizing input prompts to guide a generative AI model toward producing desired (that is, accurate) outputs.

**Structured data** are tabular data (for example, organized in tables, databases, or spreadsheets) that can be used to train some machine-learning models effectively.

**Unstructured data** lack a consistent format or structure (for example, text, images, and audio files) and typically require more advanced techniques to extract insights.

large and varied sets of unstructured data. For example, a type of foundation model called a large language model can be trained on vast amounts of text that is publicly available on the internet and covers many different topics. While other deep-learning models can operate on sizable amounts of unstructured data, they are usually trained on a more specific data set. For example, a model might be trained on a specific set of images to enable it to recognize certain objects in photographs.

In fact, other deep-learning models often can perform only one such task. They can, for example, either classify objects in a photo or perform another function such as making a prediction. In contrast, one foundation model can perform both of these functions and generate content as well. Foundation models amass these capabilities by learning patterns and relationships from the broad training data they ingest, which, for example, enables them to predict the next word in a sentence. That's how ChatGPT can answer questions about varied topics and how DALL·E 2 and Stable Diffusion can produce images based on a description.

Given the versatility of a foundation model, companies can use the same one to implement multiple business use cases, something rarely achieved using earlier deep learning models. A foundation model that has incorporated information about a company's products could potentially be used both for answering customers' questions and for supporting engineers in developing updated versions of the products. As a result, companies can stand up applications and realize their benefits much faster.

However, because of the way current foundation models work, they aren't naturally suited to all applications. For example, large language models can be prone to "hallucination," or answering questions with plausible but untrue assertions (see sidebar "Using generative AI responsibly"). Additionally, the underlying reasoning or sources for a response are not always provided. This means companies should be careful of integrating generative AI without human oversight in applications where errors can cause harm or where

explainability is needed. Generative AI is also currently unsuited for directly analyzing large amounts of tabular data or solving advanced numerical-optimization problems. Researchers are working hard to address these limitations.

### **The emerging generative AI ecosystem**

While foundation models serve as the "brain" of generative AI, an entire value chain is emerging to support the training and use of this technology (Exhibit 2).<sup>1</sup> Specialized hardware provides the extensive compute power needed to train the models. Cloud platforms offer the ability to tap this hardware. Machine-learning operations (MLOps) and model hub providers offer the tools, technologies, and practices an organization needs to adapt a foundation model and deploy it within its end-user applications. Many companies are entering the market to offer applications built on top of foundation models that enable them to perform a specific task, such as helping a company's customers with service issues.

The first foundation models required high levels of investment to develop, given the substantial computational resources required to train them and the human effort required to refine them. As a result, they were developed primarily by a few tech giants, start-ups backed by significant investment, and some open-source research collectives (for example, BigScience). However, work is under way on both smaller models that can deliver effective results for some tasks and training that's more efficient. This could eventually open the market to more entrants. Some start-ups have already succeeded in developing their own models—for example, Cohere, Anthropic, and AI21 Labs build and train their own large language models.

### **Putting generative AI to work**

CEOs should consider exploration of generative AI a must, not a maybe. Generative AI can create value in a wide range of use cases. The economics and technical requirements to start are not prohibitive, while the downside of inaction could be quickly falling behind competitors. Every CEO should work with the executive team to reflect on

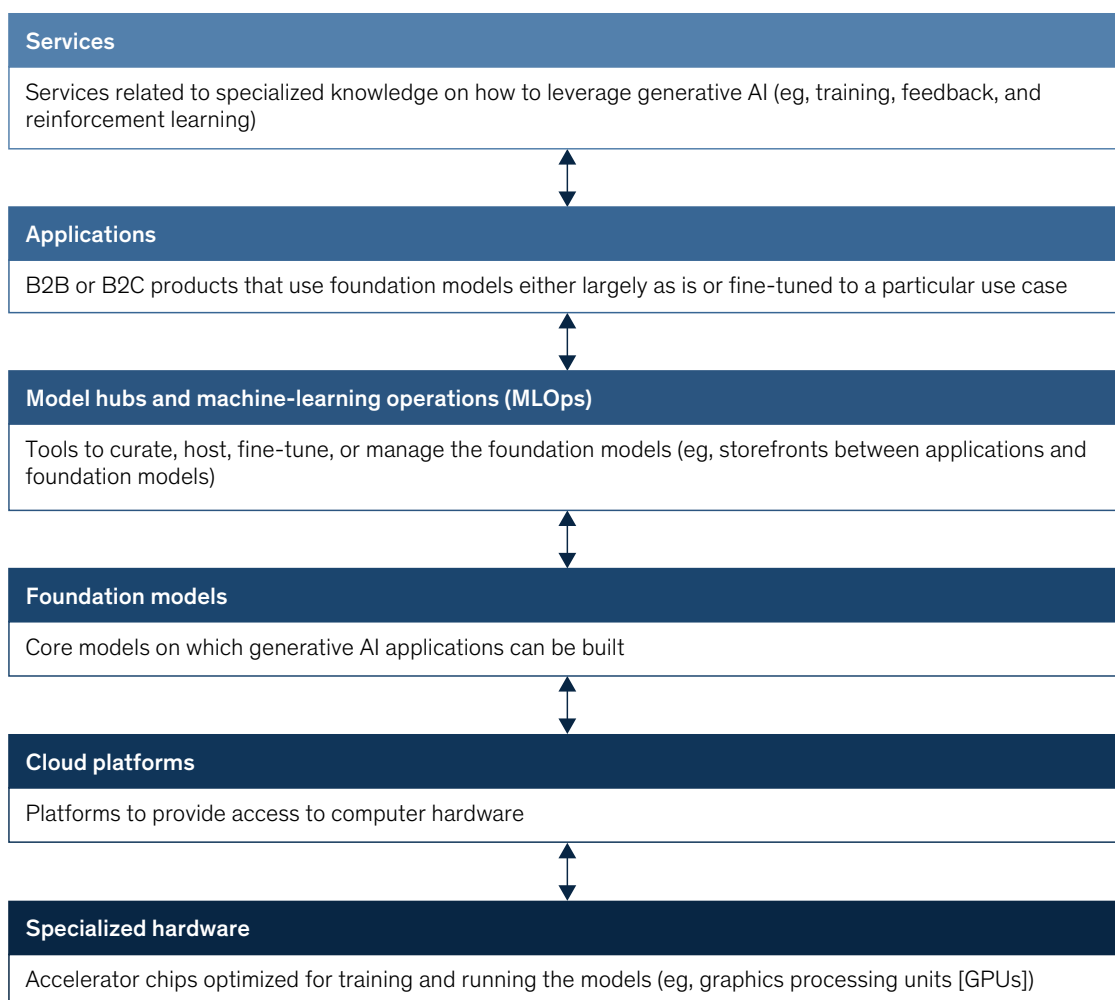
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<sup>1</sup> For more, see "Exploring opportunities in the generative AI value chain," McKinsey, April 26, 2023.

Exhibit 2

## A value chain supporting generative AI systems is developing quickly.

### Generative AI value chain



where and how to play. Some CEOs may decide that generative AI presents a transformative opportunity for their companies, offering a chance to reimagine everything from research and development to marketing and sales to customer operations. Others may choose to start small and scale later. Once the decision is made, there are technical pathways that AI experts can follow to execute the strategy, depending on the use case.

Much of the use (although not necessarily all of the value) from generative AI in an organization will

come from workers employing features embedded in the software they already have. Email systems will provide an option to write the first drafts of messages. Productivity applications will create the first draft of a presentation based on a description. Financial software will generate a prose description of the notable features in a financial report. Customer-relationship-management systems will suggest ways to interact with customers. These features could accelerate the productivity of every knowledge worker.



## Using generative AI responsibly

Generative AI poses a variety of risks. CEOs will want to design their teams and processes to mitigate those risks from the start—not only to meet fast-evolving regulatory requirements but also to protect their business and earn consumers' digital trust (we offer recommendations on how to do so later in this article).<sup>1</sup>

**Fairness:** Models may generate algorithmic bias due to imperfect training data or decisions made by the engineers developing the models.

**Intellectual property (IP):** Training data and model outputs can generate significant IP risks, including infringing on copyrighted, trademarked, patented, or otherwise legally protected materials. Even when using a provider's generative AI tool, organizations will need to understand what data went into training and how it's used in tool outputs.

**Privacy:** Privacy concerns could arise if users input information that later ends up in model outputs in a form that makes individuals identifiable. Generative AI could also be used to create and disseminate malicious content such as disinformation, deepfakes, and hate speech.

**Security:** Generative AI may be used by bad actors to accelerate the sophistication and speed of cyberattacks. It also can be manipulated to provide malicious outputs. For example, through a technique called prompt injection, a third party gives a model new instructions that trick the model into delivering an output unintended by the model producer and end user.

**Explainability:** Generative AI relies on neural networks with billions of parameters, challenging our ability to explain how any given answer is produced.

**Reliability:** Models can produce different answers to the same prompts, impeding the user's ability to assess the accuracy and reliability of outputs

**Organizational impact:** Generative AI may significantly affect the workforce, and the impact on specific groups and local communities could be disproportionately negative.

**Social and environmental impact:** The development and training of foundation models may lead to detrimental social and environmental consequences, including an increase in carbon emissions (for example, training one large language model can emit about 315 metric tons of carbon dioxide).<sup>2</sup>

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<sup>1</sup> Jim Boehm, Liz Grennan, Alex Singla, and Kate Smaje, "Why digital trust truly matters," McKinsey, September 12, 2022.

<sup>2</sup> Ananya Ganesh, Andrew McCallum, and Emma Strubell, "Energy and policy considerations for deep learning in NLP," Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics, June 5, 2019.

But generative AI can also be more transformative in certain use cases. We will look at four examples of how companies in different industries are using generative AI today to reshape how work is done within their organization.<sup>2</sup> The examples range from

those requiring minimal resources to resource-intensive undertakings. (For a quick comparison of these examples and more technical detail, see Exhibit 3.)

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<sup>2</sup> These examples are amalgamations of cases culled from our client work and public examples rather than reflective of exact events in one particular company.

Exhibit 3

The organizational requirements for generative AI range from low to high, depending on the use case.



Low ————— High

Use case example	Technical pathway	Costs	Tech talent	Proprietary data	Process adjustments
<b>Changing the work of software engineering</b>	Use software-as-a-service (SaaS) tool	Many SaaS tools offer fixed-fee subscriptions of \$10 to \$30 per user per month; some products have usage-based pricing	Little technical talent is needed—potentially for selecting the right solution and light integration work	Because the model is used as is, no proprietary data is needed	Processes largely remain the same, but workers should systematically check model results for accuracy and appropriateness
<b>Helping relationship managers keep up with the pace of public information and data</b>	Build software layers on model API	Up-front investment is needed to develop the user interface, integrate the solution, and build postprocessing layers  Running costs for API usage and software maintenance	Software development, product management, and database integration capabilities are needed, which require at least 1 data scientist, machine-learning engineer, data engineer, designer, and front-end developer	Because the model is used as is, no proprietary data is needed	Processes may be needed to enable storage of prompts and results, and guardrails may be needed to limit usage for risk or cost reasons
<b>Freeing up customer support representatives for higher-value activities</b>	Fine-tune open-source model in-house	Initial costs ~2x more than building on API due to increased human capital costs required for data cleaning and labeling and model fine-tuning  Higher running costs for model maintenance and cloud computing	Experienced data science and engineering team with machine-learning operations (MLOps) knowledge and resources to check or create labeled data needed	A proprietary, labeled data set is required to fine-tune the model, although in some cases it can be relatively small	Processes for triaging and escalating issues to humans are needed, as well as periodic assessments of model safety
<b>Accelerating drug discovery</b>	Train a foundation model from scratch	Initial costs ~10–20x more than building on API due to up-front human capital and tech infrastructure costs  Running costs for model maintenance and cloud computing similar to the above	Requires large data science and engineering team with PhD-level knowledge of subject matter, best-practice MLOps, and data and infrastructure management skills	Foundation models can be trained on large publicly available data, although long-term differentiation comes from adding owned labeled or unlabeled data (which is easier to collect)	Including the above, when training on external data, thorough legal review is needed to prevent IP issues



### Changing the work of software engineering

The first example is a relatively low-complexity case with immediate productivity benefits because it uses an off-the-shelf generative AI solution and doesn't require in-house customization.

The biggest part of a software engineer's job is writing code. It's a labor-intensive process that requires extensive trial and error and research into private and public documentation. At this company, a shortage of skilled software engineers has led to a large backlog of requests for features and bug fixes.

To improve engineers' productivity, the company is implementing an AI-based code-completion product that integrates with the software the engineers use to code. This allows engineers to write code descriptions in natural language, while the AI suggests several variants of code blocks that will satisfy the description. Engineers can select one of the AI's proposals, make needed refinements, and click on it to insert the code.

Our research has shown that such tools can speed up a developer's code generation by as much as 50 percent. It can also help in debugging, which may improve the quality of the developed product. But today, generative AI cannot replace skilled software engineers. In fact, more-experienced engineers appear to reap the greatest productivity benefits

from the tools, with inexperienced developers seeing less impressive—and sometimes negative—results. A known risk is that the AI-generated code may contain vulnerabilities or other bugs, so software engineers must be involved to ensure the quality and security of the code (see the final section in this article for ways to mitigate risks).

The cost of this off-the-shelf generative AI coding tool is relatively low, and the time to market is short because the product is available and does not require significant in-house development. Cost varies by software provider, but fixed-fee subscriptions range from \$10 to \$30 per user per month. When choosing a tool, it's important to discuss licensing and intellectual property issues with the provider to ensure the generated code doesn't result in violations.

Supporting the new tool is a small cross-functional team focused on selecting the software provider and monitoring performance, which should include checking for intellectual property and security issues. Implementation requires only workflow and policy changes. Because the tool is purely off-the-shelf software as a service (SaaS), additional computing and storage costs are minimal or nonexistent.



### **Helping relationship managers keep up with the pace of public information and data**

Companies may decide to build their own generative AI applications, leveraging foundation models (via APIs or open models), instead of using an off-the-shelf tool. This requires a step up in investment from the previous example but facilitates a more customized approach to meet the company's specific context and needs.

In this example, a large corporate bank wants to use generative AI to improve the productivity of relationship managers (RMs). RMs spend considerable time reviewing large documents, such as annual reports and transcripts of earnings calls, to stay informed about a client's situation and priorities. This enables the RM to offer services suited to the client's particular needs.

The bank decided to build a solution that accesses a foundation model through an API. The solution scans documents and can quickly provide synthesized answers to questions posed by RMs. Additional layers around the foundation model are built to streamline the user experience, integrate the tool with company systems, and apply risk

and compliance controls. In particular, model outputs must be verified, much as an organization would check the outputs of a junior analyst, because some large language models have been known to hallucinate. RMs are also trained to ask questions in a way that will provide the most accurate answers from the solution (called prompt engineering), and processes are put in place to streamline validation of the tool's outputs and information sources.

In this instance, generative AI can speed up an RM's analysis process (from days to hours), improve job satisfaction, and potentially capture insights the RM might have otherwise overlooked.

The development cost comes mostly from the user interface build and integrations, which require time from a data scientist, a machine-learning engineer or data engineer, a designer, and a front-end developer. Ongoing expenses include software maintenance and the cost of using APIs. Costs depend on the model choice and third-party vendor fees, team size, and time to minimum viable product.





### **Freeing up customer support representatives for higher-value activities**

The next level of sophistication is fine-tuning a foundation model. In this example, a company uses a foundation model optimized for conversations and fine-tunes it on its own high-quality customer chats and sector-specific questions and answers. The company operates in a sector with specialized terminology (for example, law, medicine, real estate, and finance). Fast customer service is a competitive differentiator.

This company's customer support representatives handle hundreds of inbound inquiries a day. Response times were sometimes too high, causing user dissatisfaction. The company decided to introduce a generative AI customer-service bot to handle most customer requests. The goal was a swift response in a tone that matched the company brand and customer preferences. Part of the process of fine-tuning and testing the foundation model includes ensuring that responses are aligned with the domain-specific language, brand promise, and tone set for the company; ongoing monitoring is required to verify the performance of the system across multiple dimensions, including customer satisfaction.

The company created a product road map consisting of several waves to minimize potential model errors. In the first wave, the chatbot was piloted internally. Employees were able to give "thumbs up" or "thumbs down" answers to the model's suggestions,

and the model was able to learn from these inputs. As a next step, the model "listened" to customer support conversations and offered suggestions. Once the technology was tested sufficiently, the second wave began, and the model was shifted toward customer-facing use cases with a human in the loop. Eventually, when leaders are completely confident in the technology, it can be largely automated.

In this case, generative AI freed up service representatives to focus on higher-value and complex customer inquiries, improved representatives' efficiency and job satisfaction, and increased service standards and customer satisfaction. The bot has access to all internal data on the customer and can "remember" earlier conversations (including phone calls), representing a step change over current customer chatbots.

To capture the benefits, this use case required material investments in software, cloud infrastructure, and tech talent, as well as higher degrees of internal coordination in risk and operations. In general, fine-tuning foundation models costs two to three times as much as building one or more software layers on top of an API. Talent and third-party costs for cloud computing (if fine-tuning a self-hosted model) or for the API (if fine-tuning via a third-party API) account for the increased costs. To implement the solution, the company needed help from DataOps (enhanced DevOps for data) and MLOps experts as well as input from other functions such as product management, design, legal, and customer service specialists.





### Accelerating drug discovery

The most complex and customized generative AI use cases emerge when no suitable foundation models are available and the company needs to build one from scratch. This situation may arise in specialized sectors or when working with unique data sets that are significantly different from the data used to train existing foundation models, as this pharmaceutical example demonstrates. Training a foundation model from scratch presents substantial technical, engineering, and resource challenges. The additional return on investment from using a higher-performing model should outweigh the financial and human capital costs.

In this example, research scientists in drug discovery at a pharmaceutical company had to decide which experiments to run next, based on microscopy images. They had a data set of millions of these images, containing a wealth of visual information on cell features that are relevant to drug discovery but difficult for a human to interpret. The images were used to evaluate potential therapeutic candidates.

The company decided to create a tool that would help scientists understand the relationship between drug chemistry and the recorded microscopy outcomes to accelerate R&D efforts. Because such multimodal models are still in infancy, the company decided to train its own instead. To build the model, team members employed both real-world images that are used to train image-based foundational models and their large internal microscopy image data set.

The trained model added value by predicting which drug candidates might lead to favorable outcomes

and by improving the ability to accurately identify relevant cell features for drug discovery. This can lead to more efficient and effective drug discovery processes, not only improving time to value but also reducing the number of inaccurate, misleading, or failed analyses.

In general, training a model from scratch costs ten to 20 times more than building software around a model API. Larger teams (including, for example, PhD-level machine-learning experts) and higher compute and storage spending account for the differences in cost. The projected cost of training a foundation model varies widely based on the desired level of model performance and modeling complexity. Those factors influence the required size of the data set, team composition, and compute resources. In this use case, the engineering team and the ongoing cloud expenses accounted for the majority of costs.

The company found that major updates to its tech infrastructure and processes would be needed, including access to many GPU instances to train the model, tools to distribute the training across many systems, and best-practice MLOps to limit cost and project duration. Also, substantial data-processing work was required for collection, integration (ensuring files of different data sets are in the same format and resolution), and cleaning (filtering low-quality data, removing duplicates, and ensuring distribution is in line with the intended use). Since the foundation model was trained from scratch, rigorous testing of the final model was needed to ensure that output was accurate and safe to use.

### **Lessons CEOs can take away from these examples**

The use cases outlined here offer powerful takeaways for CEOs as they embark on the generative AI journey:

- Transformative use cases that offer practical benefits for jobs and the workplace already exist. Companies across sectors, from pharmaceuticals to banking to retail, are standing up a range of use cases to capture value creation potential. Organizations can start small or large, depending on their aspiration.
- Costs of pursuing generative AI vary widely, depending on the use case and the data required for software, cloud infrastructure, technical expertise, and risk mitigation. Companies must take into account risk issues, regardless of use case, and some will require more resources than others.
- While there is merit to getting started fast, building a basic business case first will help companies better navigate their generative AI journeys.

### **Considerations for getting started**

The CEO has a crucial role to play in catalyzing a company's focus on generative AI. In this closing section, we discuss strategies that CEOs will want to keep in mind as they begin their journey. Many of them echo the responses of senior executives to previous waves of new technology. However, generative AI presents its own challenges, including managing a technology moving at a speed not seen in previous technology transitions.

#### **Organizing for generative AI**

Many organizations began exploring the possibilities for traditional AI through siloed experiments. Generative AI requires a more deliberate and coordinated approach given its unique risk considerations and the ability of foundation models to underpin multiple use cases across an organization. For example, a model fine-tuned using proprietary material to reflect the enterprise's brand identity could be deployed across several

use cases (for example, generating personalized marketing campaigns and product descriptions) and business functions, such as product development and marketing.

To that end, we recommend convening a cross-functional group of the company's leaders (for example, representing data science, engineering, legal, cybersecurity, marketing, design, and other business functions). Such a group can not only help identify and prioritize the highest-value use cases but also enable coordinated and safe implementation across the organization.

#### **Reimagining end-to-end domains versus focusing on use cases**

Generative AI is a powerful tool that can transform how organizations operate, with particular impact in certain business domains within the value chain (for example, marketing for a retailer or operations for a manufacturer). The ease of deploying generative AI can tempt organizations to apply it to sporadic use cases across the business. It is important to have a perspective on the family of use cases by domain that will have the most transformative potential across business functions. Organizations are reimagining the target state enabled by generative AI working in sync with other traditional AI applications, along with new ways of working that may not have been possible before.

#### **Enabling a fully loaded technology stack**

A modern data and tech stack is key to nearly any successful approach to generative AI. CEOs should look to their chief technology officers to determine whether the company has the required technical capabilities in terms of computing resources, data systems, tools, and access to models (open source via model hubs or commercial via APIs).

For example, the lifeblood of generative AI is fluid access to data honed for a specific business context or problem. Companies that have not yet found ways to effectively harmonize and provide ready access to their data will be unable to fine-tune generative AI to unlock more of its potentially transformative uses. Equally important is to design a scalable data architecture that includes data governance and

security procedures. Depending on the use case, the existing computing and tooling infrastructure (which can be sourced via a cloud provider or set up in-house) might also need upgrading. A clear data and infrastructure strategy anchored on the business value and competitive advantage derived from generative AI will be critical.

### **Building a ‘lighthouse’**

CEOs will want to avoid getting stuck in the planning stages. New models and applications are being developed and released rapidly. GPT-4, for example, was released in March 2023, following the release of ChatGPT (GPT-3.5) in November 2022 and GPT-3 in 2020. In the world of business, time is of the essence, and the fast-paced nature of generative AI technology demands that companies move quickly to take advantage of it. There are a few ways executives can keep moving at a steady clip.

Although generative AI is still in the early days, it's important to showcase internally how it can affect a company's operating model, perhaps through a “lighthouse approach.” For example, one way forward is building a “virtual expert” that enables frontline workers to tap proprietary sources of knowledge and offer the most relevant content to customers. This has the potential to increase productivity, create enthusiasm, and enable an organization to test generative AI internally before scaling to customer-facing applications.

As with other waves of technical innovation, there will be proof-of-concept fatigue and many examples of companies stuck in “pilot purgatory.” But encouraging a proof of concept is still the best way to quickly test and refine a valuable business case before scaling to adjacent use cases. By focusing on early wins that deliver meaningful results, companies can build momentum and then scale out and up, leveraging the multipurpose nature of generative AI. This approach could enable companies to promote broader AI adoption and create the culture of innovation that is essential to maintaining a competitive edge. As outlined above, the cross-functional leadership team will want to

make sure such proofs of concept are deliberate and coordinated.

### **Balancing risk and value creation**

As our four detailed use cases demonstrate, business leaders must balance value creation opportunities with the risks involved in generative AI. According to our recent Global AI Survey, most organizations don't mitigate most of the risks associated with traditional AI, even though more than half of organizations have already adopted the technology.<sup>3</sup> Generative AI brings renewed attention to many of these same risks, such as the potential to perpetuate bias hidden in training data, while presenting new ones, such as its propensity to hallucinate.

As a result, the cross-functional leadership team will want to not only establish overarching ethical principles and guidelines for generative AI use but also develop a thorough understanding of the risks presented by each potential use case. It will be important to look for initial use cases that both align with the organization's overall risk tolerance and have structures in place to mitigate consequential risk. For example, a retail organization might prioritize a use case that has slightly lower value but also lower risk—such as creating initial drafts of marketing content and other tasks that keep a human in the loop. At the same time, the company might set aside a higher-value, high-risk use case such as a tool that automatically drafts and sends hyperpersonalized marketing emails. Such risk-forward practices can enable organizations to establish the controls necessary to properly manage generative AI and maintain compliance.

CEOs and their teams will also want to stay current with the latest developments in generative AI regulation, including rules related to consumer data protection and intellectual property rights, to protect the company from liability issues. Countries may take varying approaches to regulation, as they often already do with AI and data. Organizations may need to adapt their working approach to calibrate process management, culture, and talent

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<sup>3</sup> “The state of AI in 2022—and a half decade in review,” McKinsey, December 6, 2022.

management in a way that ensures they can handle the rapidly evolving regulatory environment and risks of generative AI at scale.

### **Applying an ecosystem approach to partnerships**

Business leaders should focus on building and maintaining a balanced set of alliances. A company's acquisitions and alliances strategy should continue to concentrate on building an ecosystem of partners tuned to different contexts and addressing what generative AI requires at all levels of the tech stack, while being careful to prevent vendor lock-in.

Partnering with the right companies can help accelerate execution. Organizations do not have to build out all applications or foundation models themselves. Instead, they can partner with generative AI vendors and experts to move more quickly. For instance, they can team up with model providers to customize models for a specific sector or partner with infrastructure providers that offer support capabilities such as scalable cloud computing.

Companies can use the expertise of others and move quickly to take advantage of the latest generative AI technology. But generative AI models are just the tip of the spear: multiple additional elements are required for value creation.

### **Focusing on required talent and skills**

To effectively apply generative AI for business value, companies need to build their technical capabilities and upskill their current workforce. This requires a concerted effort by leadership to identify the required capabilities based on the company's prioritized use cases, which will likely extend beyond technical roles to include a talent mix across engineering, data, design, risk, product, and other business functions.

As demonstrated in the use cases highlighted above, technical and talent needs vary widely depending on the nature of a given implementation—from using off-the-shelf solutions to building a foundation model from scratch. For example, to build a generative model, a company may need PhD-level machine-learning experts; on the other hand, to develop generative AI tools using existing models and SaaS offerings, a data engineer and a software engineer may be sufficient to lead the effort.

In addition to hiring the right talent, companies will want to train and educate their existing workforces. Prompt-based conversational user interfaces can make generative AI applications easy to use. But users still need to optimize their prompts, understand the technology's limitations, and know where and when they can acceptably integrate the application into their workflows.

**Generative AI models are just the tip of the spear: multiple additional elements are required for value creation.**

Leadership should provide clear guidelines on the use of generative AI tools and offer ongoing education and training to keep employees apprised of their risks. Fostering a culture of self-driven research and experimentation can also encourage employees to innovate processes and products that effectively incorporate these tools.



Businesses have been pursuing AI ambitions for years, and many have realized new revenue streams, product improvements, and operational efficiencies. Much of the successes in these areas

have stemmed from AI technologies that remain the best tool for a particular job, and businesses should continue scaling such efforts. However, generative AI represents another promising leap forward and a world of new possibilities. While the technology's operational and risk scaffolding is still being built, business leaders know they should embark on the generative AI journey. But where and how should they start? The answer will vary from company to company as well as within an organization. Some will start big; others may undertake smaller experiments. The best approach will depend on a company's aspiration and risk appetite. Whatever the ambition, the key is to get under way and learn by doing.

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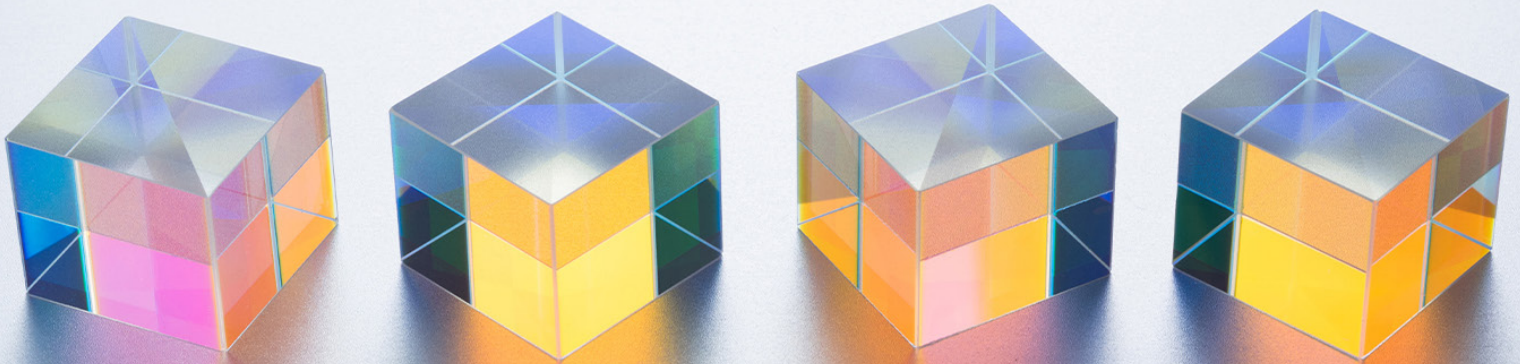
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# Four essential questions for boards to ask about generative AI

Boards are responsible for how generative AI is used at the companies they oversee. Asking company leaders the right questions will help unlock the technology's value while managing its risk.

*by Frithjof Lund, Dana Maor, Nina Spielmann, and Alexander Sukharevsky*



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**Company executives are scrambling** to understand and respond to generative AI. This technology is still nascent, but of those who have used it, few doubt its power to disrupt operating models in all industries.

We recently provided a view of how CEOs might start preparing for what lies ahead.<sup>1</sup> But what is the role of the board? Many board members tell us they aren't sure how to support their CEOs as they grapple with the changes that generative AI has unleashed, not least because the technology seems to be developing and getting adopted at lightning speed.

The early use cases are awe inspiring. A software developer can use generative AI to create entire lines of code. Law firms can answer complex questions from reams of documentation. Scientists can create novel protein sequences to accelerate drug discovery. But the technology still poses real risks, leaving companies caught between fear of getting left behind—which implies a need to rapidly integrate generative AI into their businesses—and an equal fear of getting things wrong. The question becomes how to unlock the value of generative AI while also managing its risks.

Board members can help their management teams move forward by asking the right questions. In this article, we provide four questions boards should consider asking company leaders, as well as a question for members to ask themselves.

## Questions for management

Generative AI models—deep-learning models trained on extremely large sets of unstructured data—have the potential to increase efficiency and productivity, reduce costs, and generate new growth. The power of these “foundation” models lies in the fact that, unlike previous deep learning models, they can perform not just one function but several, such as classifying, editing, summarizing, answering questions, and drafting new content. This enables companies to use them to launch multiple

applications with relative ease, even if users lack deep AI and data science know-how.

Board members can equip their C-suite to harness this potential power thoughtfully but decisively by asking the following four broad questions.

### How will generative AI affect our industry and company in the short and longer term?

Forming any sensible generative AI strategy will require an understanding of how the technology might affect an industry and the businesses within it in the short and longer term. Our research suggests that the first wave of applications will be in software engineering, marketing and sales, customer service, and product development.<sup>2</sup> As a result, the early impact of generative AI will probably be found in the industries that rely particularly heavily on these functions—for example, media and entertainment, banking, consumer goods, telecommunications, life sciences, and technology companies.

Even so, companies in other industries should not delay in assessing the potential value at stake for their company. The technology and its adoption are moving too fast. Recall that the public-facing version of ChatGPT reached 100 million users in just two months, making it the fastest-growing app ever. And our research finds that generative AI can increase worker productivity across industries, adding up to \$7.9 trillion in value globally from adoption of specific use cases and the myriad ways workers can use the technology in everyday activities.<sup>3</sup> Each company will want to explore immediate opportunities to improve efficiency and effectiveness. Those that don't may quickly find themselves trailing behind competitors that answer customer queries more accurately and faster or launch new digital products more rapidly because generative AI is helping write the code. They risk falling behind on the learning curve, too.

Simultaneously, companies will want to begin looking further out. No one can predict the full implications of generative AI, but considering them is important. How might the competitive

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<sup>1</sup> “What every CEO should know about generative AI,” McKinsey, May 12, 2023.

<sup>2</sup> “The economic potential of generative AI: The next productivity frontier,” McKinsey, June 14, 2023.

<sup>3</sup> Ibid.

environment change? How might the business benefit, and where does it look vulnerable? And are there ways to future-proof the strategy and business model?

### **Are we balancing value creation with adequate risk management?**

An assessment of the new frontiers opened by generative AI will rightly make management teams eager to begin innovating and capturing its value. But that eagerness will need to be accompanied by caution, as generative AI, if not well managed, has the potential to destroy value and reputations. It poses the same—and more—risks as traditional AI.

Like traditional AI, generative AI raises privacy concerns and ethical risks, such as the potential to perpetuate bias hidden in training data. And it heightens the risk of a security breach by opening up more areas of attack and new forms of attack. For example, deepfakes simplify the impersonation of company leaders, raising reputation risks. There are also new risks, such as the risk of infringing copyrighted, trademarked, patented, or otherwise legally protected materials by using data collected by a generative AI model.

Generative AI also has a propensity to hallucinate—that is, generate inaccurate information, expressing it in a manner that appears so natural and authoritative that the inaccuracies are difficult to detect. This could prove dangerous not only for companies but also for society at large. There is widespread concern that generative AI could stoke misinformation, and some industry experts have said it could be as dangerous to society as pandemics or nuclear war if not properly regulated.<sup>4</sup>

Companies will therefore need to understand the value and the risks of each use case and determine how these align with the company's risk tolerance and other objectives. For example, with regard to sustainability objectives, they might consider generative AI's implications for the environment because it requires substantial computing capacity.

From there, boards need to be satisfied that the company has established legal and regulatory

frameworks for the knowable generative AI risks assumed across the company and that AI activities within the company are continually reviewed, measured, and audited. They will also want to ensure mechanisms are in place to continually explore and assess risks and ethical concerns that are not yet well understood or even apparent. How, for example, will companies stand up processes to spot hallucination and mitigate the risk of wrong information eliciting incorrect or even harmful action? How will the technology affect employment? And what of the risks posed by third parties using the technology? A clear-eyed early view on where problems might lie is the key to addressing them.

The bottom line is that AI must always be subject to the effective oversight of those designing and using it. Support for the effort can come from government regulatory frameworks and guidance being developed on how to use and apply generative AI. It will be important for companies to keep abreast of these.

### **How should we organize for generative AI?**

Many companies took an experimental approach to implementing previous generations of AI technology, with those keenest to explore its possibilities launching pilots in pockets of the organization. But given the speed of developments within generative AI and the risks it raises, companies will need a more coordinated approach. Getting stuck in pilot mode really isn't an option. Indeed, the CEO of one multinational went as far as to ask each of his 50 business leaders to fully implement two use cases without delay, such was his conviction that generative AI would rapidly lend competitive advantage.

Company leaders should consider appointing a single senior executive to take responsibility for the oversight and control of all generative AI activities. A smart second step is to establish a cross-functional group of senior people representing data science, engineering, legal, cybersecurity, marketing, design, and other business functions. Such a team can collaborate to formulate and implement a strategy quickly and widely.

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<sup>4</sup> Cristina Criddle, "AI executives warn its threat to humanity rivals 'pandemics and nuclear war,'" *Financial Times*, May 30, 2023.

And bear in mind that a foundation model can underpin multiple use cases across an organization, so board members will want to ask the appointed generative AI leader to ensure that the organization takes a coordinated approach. This will promote the prioritization of use cases that deliver fast, high-impact results. More complex use cases can be developed thereafter. Importantly, a coordinated approach will also help ensure a full view of any risks assumed.

The board will also want to check that there's a strategy for establishing what is likely to be a wide range of partnerships and alliances—with providers that customize models for a specific sector, for example, or with infrastructure providers that offer capabilities such as scalable cloud computing. The right partnerships with the right experts will help companies move quickly to create value from generative AI, though they will want to take care to prevent vendor lock-in and oversee possible third-party risks.

#### **Do we have the necessary capabilities?**

To keep pace with generative AI, companies may need to review their organizational capabilities on three fronts.

#### **Technology**

The first front is technology. A modern data and tech stack will be the key to success in using generative AI. While foundation models can support a wide range of use cases, many of the most impactful models will be those fed with additional, often proprietary, data. Therefore, companies that have not yet found ways to harmonize and provide ready access to their data will be unable to unlock much of generative AI's potentially transformative power. Equally important is the ability to design a scalable data architecture that includes data governance and security procedures. Depending on the use case, the existing computing and tooling infrastructure might also need upgrading. Is the management team clear about the computing resources, data systems, tools, and models required? And does it have a strategy for acquiring them?

#### **Talent**

The introduction of generative AI, like any change, also requires a reassessment of the organization's talent. Companies are aware they need to reskill the workforce to compete in a world where data and AI play such a big role, though many are struggling to attract and retain the people they need. With generative AI, the challenge just got harder. Some roles will disappear, others will be radically different, and some will be new. Such changes will likely affect more people in more domains and faster than has been the case with AI to date.

The precise new skills required will vary by use case. For example, if the use case is relatively straightforward and can be supported by an off-the-shelf foundation model, a generalist may be able to lead the effort with the help of a data and software engineer. But with highly specialized data—as might be the case for drug development—the company may need to build a generative AI model from scratch. In that case, the company may need to hire PhD-level experts in machine learning.

The board will therefore want to query leadership as to whether it has a dynamic understanding of its AI hiring needs and a plan for fulfilling them. Also, the existing workforce will need to be trained to integrate generative AI into their day-to-day work and to equip some workers to take on new roles. But tech skills are not the only consideration, as generative AI arguably puts a premium on more advanced analytical and creative skills to supplement the technology's capabilities. The talent model may therefore need to change—but with consideration of a caution raised recently at the World Economic Forum: using AI as a substitute for the work of junior-level talent could endanger the development of the next generation of creators, leaders, and managers.<sup>5</sup>

#### **Organizational culture**

Finally, a company's culture shapes how well it will succeed with generative AI. Companies that struggle with innovation and change will likely struggle to keep pace. It's a big question, but does the company have the learning culture that will be

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<sup>5</sup> Ravin Jesuthasan, "Here's how companies should navigate generative AI in the world of work," World Economic Forum, April 14, 2023.

a key to success? And does the company have a shared sense of responsibility and accountability? Without this shared sense, it is more likely to run afoul of the ethical risks associated with the technology.

Both questions involve cultural issues that boards should consider prompting their management teams to examine. Depending on what they find, reformulating a company's culture could prove to be an urgent task.

### A question for the board

As boards try to support their CEOs in creating value from generative AI and managing its risks, they will also want to direct a preliminary, fundamental question to themselves: are we equipped to provide that support?

Unless board members understand generative AI and its implications, they will be unable to judge the likely impact of a company's generative AI strategy and the related decisions regarding investments, risk, talent, technology, and more on the organization and its stakeholders. Yet, our conversations with board members revealed that many of them admit they lack this understanding. When that is the case, boards can consider three ways to improve matters.

The first option is to review the board's composition and adjust it as necessary to ensure sufficient technological expertise is available. In the past, when companies have struggled to find technology experts with the broader business expertise required of a board member, some have obtained additional support by setting up technology advisory boards that include generative AI experts. However, generative AI will likely have an impact on every aspect of a company's operations—risk, remuneration, talent, cybersecurity, finance, and

strategy, for example. Arguably, therefore, AI expertise needs to be widespread so that the full board and all its committees can properly consider its implications.

Second, the board can improve its members' understanding of generative AI. Training sessions run by the company's own experts and by external experts on the front line of developments can give board members an understanding of how generative AI works, how it might be applied in the business, the potential value at stake, the risks, and the evolution of the technology.

Third, the board can incorporate generative AI into its own work processes. Hands-on experience in the boardroom can build familiarity with the technology and appreciation of its value and risks. Moreover, because generative AI can improve decision making, it would be remiss of boards not to explore its potential to help them perform their duties to the best of their ability. For example, they might use it to surface additional critical questions on strategic issues or to deliver an additional point of view to consider when making a decision.

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Generative AI is developing fast, and companies will have to balance pace and innovation with caution. The board's role is to constructively challenge the management team to ensure this happens, keeping the organization at the forefront of this latest technological development yet intensely mindful of the risks. The questions posed here are not, of course, exhaustive, and more will arise as the technology progresses. But they are a good place to start. Ultimately, board members hold responsibility for how generative AI is used in the companies they oversee, and the answers they receive should help them meet that responsibility wisely.

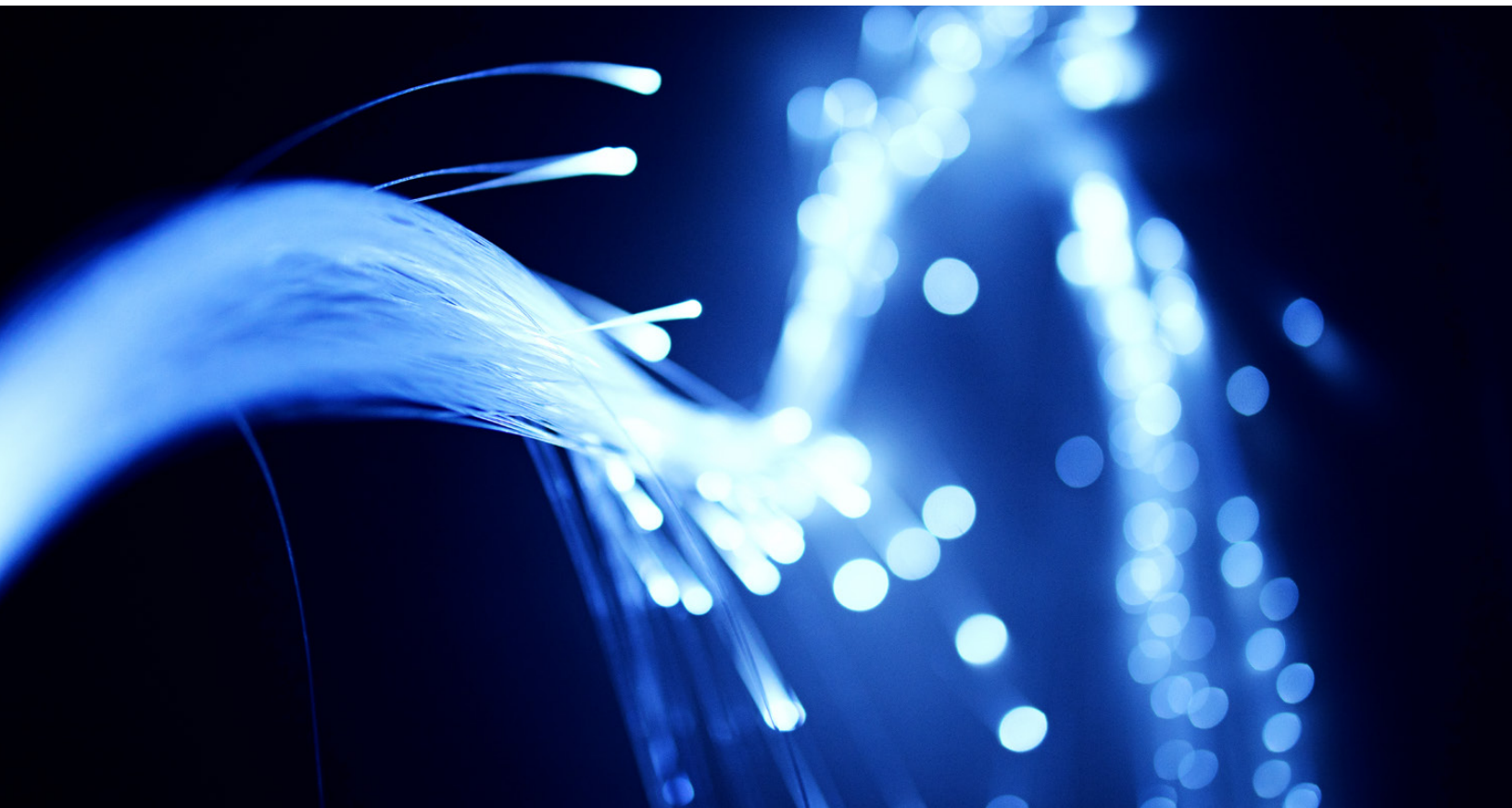
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# Applied AI: Six growth considerations for private markets

As applied AI heats up, we identified key six findings for stakeholders, including investors, to keep in mind as they think about companies in the industry.

*by Iliia Bakhtourine, Ben Ellenweig, John Larson, and Vish Narayanan*



**Innovation and excitement** are surging in applied AI. Recent displays of capabilities in areas such as generative AI have further boosted the technology's profile.

Of course, the industry is still young, with plenty of opportunities for growth as organizations increase their adoption of AI and their spending on the technology. McKinsey analysis suggests that the value at stake from AI can reach \$15 trillion.<sup>1</sup> For now, however, market penetration is still very low: about 50 to 60 percent of companies have deployed AI but have not scaled it.<sup>2</sup> We estimate a ceiling of about 30 percent market adoption in AI's mature use cases for individual business functions. The technology's commercial potential has drawn a flood of private investment, which hit a record \$93.5 billion in 2021.<sup>3</sup>

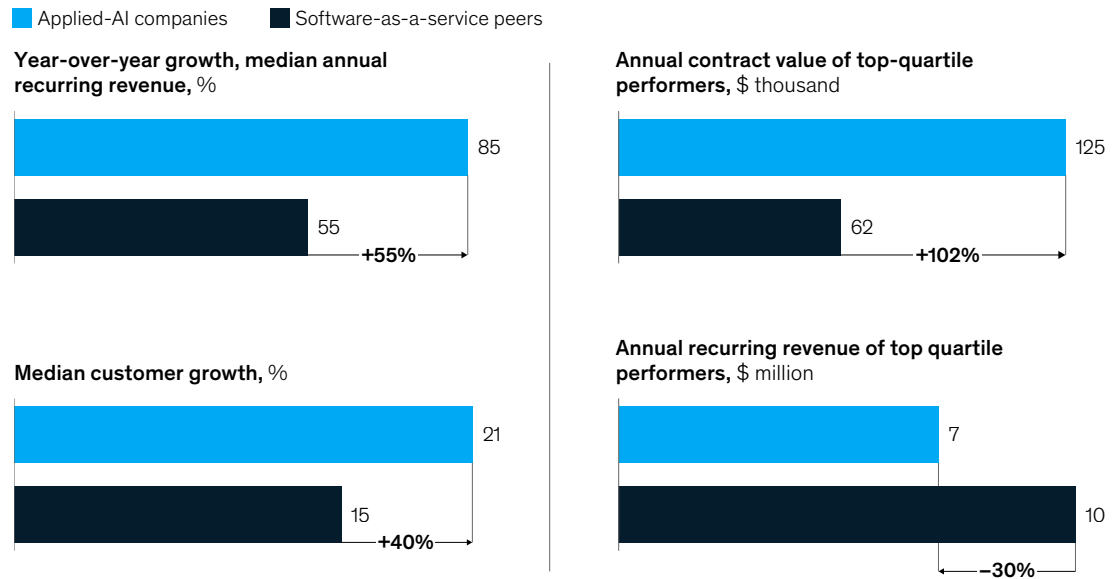
This attention is partly based on the industry's high growth. But at the same time, our analysis of software and applied-AI companies shows that AI companies are less efficient at generating revenue compared with their software-as-a-service (SaaS) counterparts. Still, the sector will likely continue to be commercially and technologically significant. We offer a short perspective on the possible direction of the growing industry.

### How AI revenue looks different from SaaS revenue

Our analysis of 187 software and AI companies in our benchmark database shows that while applied-AI companies have promising growth profiles, their revenue is less repeatable and efficient compared with that of traditional SaaS companies (exhibit).

Exhibit

### Applied-AI companies are growing, but they create revenue less efficiently than software-as-a-service companies.



Source: McKinsey analysis of 187 software and applied-AI companies in McKinsey's SaaS Radar benchmark, 2017–22

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<sup>1</sup> Michael Chui, Roger Roberts, and Lareina Yee, "McKinsey Technology Trends Outlook 2022," McKinsey, August 24, 2022.

<sup>2</sup> "The state of AI in 2022—and a half decade in review," McKinsey, December 6, 2022.

<sup>3</sup> "McKinsey Technology Trends Outlook 2022," August 24, 2022.



Specifically, the average applied-AI company has a growth efficiency (the ratio of realized annual recurring revenue to marketing and sales spending) of about 70 percent, compared with about 95 percent for their SaaS counterparts. According to our analysis, three key factors appear to contribute to this difference.

**Higher costs of marketing and sales.** Prospective buyers don't necessarily consider applied-AI solutions and their propositions to be mission critical, particularly because companies may lack a robust track record of applied-AI use cases. At the same time, the sales path for applied-AI solutions is often unclear, including considerations such as which stakeholders have budgets for AI solutions. The lack of both clear targets and an obvious way forward extends the sales cycle. As a result, the lifetime value of applied-AI customers is lower than it is for SaaS customers, even with nearly identical average customer churns of about 15 percent per year. However, the push to adopt generative AI may change this in the near future.

**Less efficient spending at scale.** The applied-AI companies in the top quartile of our data set spend 40 percent of their revenue on general and administrative expenses and 50 percent of their revenue on R&D. Both numbers are more than ten percentage points higher than their equivalents for their SaaS peers.

Traditional software is developed once and can be shipped an infinite number of times. In contrast, applied-AI companies' spending efficiency tends to be limited as they scale. Applied-AI companies take on manual activities such as data cleansing and model tuning more often, pay more for scarce AI talent, work more directly with data because of demand for specialization and responsiveness, and bear considerable ongoing costs for data storage and computing for product development.

**Costly professional services.** Because of the scarcity and high cost of AI talent, the strongest-performing applied-AI companies provide AI-specific professional services to their buyers.

However, these offerings may affect revenue growth: fees may increase to the total contract value, but the services are often not easily repeatable, cannot rapidly scale, and are costly to maintain.

## Considerations when thinking about applied-AI companies

Six considerations can help stakeholders think about applied-AI companies as the industry develops.

### A clear ROI story

Applied-AI investments would ideally have a clear market niche with adjacencies. In informal interactions, experts in the industry suggest that a company with a niche in the \$15 trillion total addressable market might have a serviceable available market worth \$1 billion to \$3 billion and focus on a market segment that combines factors such as geography, industry, the end customer, and business function.

The ideal applied-AI company would also have a combination of captive users, private data sets, or other protective assets stemming from their technology, data, or machine-learning capabilities. These advantages can help them stay ahead of competitors that may use open-source tools or public data to develop their offerings.

Stakeholders could also look for signs of early customer evangelism. This authentic, unsolicited enthusiasm for their products could confirm that the AI use case is critical to their customers, rather than a nice to have. Beyond that, network effects—from data assets or expertise—may be a sign that a company's offerings could be resistant to commoditization and margin compression.

### Better customer segmentation models

While the value of applied AI is generally accepted, not all buyers are convinced that applied-AI solutions are critical. Go-to-market strategies should therefore use a segmentation approach that emphasizes buyer segments in which sustaining an operating model without innovative technologies is increasingly difficult. That is, applied-AI solutions may be most valuable to buyers in

industries that are highly competitive and in which technology can provide a critical advantage. Of course, this approach to buyer segmentation should complement—not replace—traditional ways of articulating companies' value proposition.

#### **A plan for multipersona marketing**

Decision making related to adopting an AI solution is often shared among managers, business users, data scientists, and IT professionals. Such buyer personas often play different roles in the purchasing and adoption journey, such as decision maker, champion, and end user. Because the personas and roles will likely differ, AI solutions' value proposition might be distinct for each persona to best address their pain points, needs, and goals. These considerations may require the coordinated use of diverse channels on the way to a purchasing consensus.

#### **Captive workflows to defend against competition**

The commercially and strategically strongest AI and machine-learning product companies build workflows that capture the entire user process and, crucially, create feedback loops and reinforcement learning so end users can contribute to the AI by confirming or disagreeing with its outputs.

Of course, just as with SaaS, lock-in and customer stickiness will likely come from a strong go-to-market approach, control over the postsales process, and a

deep understanding of vertical application (in which a solution is designed for the specific needs of a market, industry, or company).

#### **New efficiency levers**

AI companies are seeing advantages in developing ways to optimize spending in product development. R&D partnerships and improved tooling in data and model development in product engineering, also known as MLOps, can help. Any efficiencies can be built into the product, which could help the company create revenue more efficiently.

#### **A multiyear go-to-market road map to becoming embedded solutions**

As individual AI companies gain traction and expand their market share, they would ideally become embedded in their customers' processes and capture their customers for the long term. To do this, AI companies could plan for three key waves of adoption.

The first wave is early adoption, which is ongoing. Applied-AI solutions currently provide improvements to traditional business processes, prove their value, and manage risks en route to establishing product-market fit. In this phase, AI solutions would be easy to use, likely by providing an interface that fits into customers' current ways of working.

**Applied-AI solutions may be most valuable to buyers in industries that are highly competitive and in which technology can provide a critical advantage.**

The second wave is step-change innovation, which could occur over the course of about three years after a product–market fit is established. In this phase, AI becomes embedded in business processes and operates with significant human oversight.

Last, AI might disrupt conventional workflows, with AI solutions taking the place of existing processes. This phase requires mature and tested technology that is highly embedded in businesses, so much so that stakeholders would have a hard time imagining

working without the AI-powered solutions. This relationship with AI-powered solutions would spur businesses to reorganize around them, becoming long-term customers.

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Applied AI has attracted a surge of investor attention thanks to rocketing public awareness, but a thoughtful approach can help companies make their way toward sustainability and continued growth.

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## Chapter 3

# Private equity

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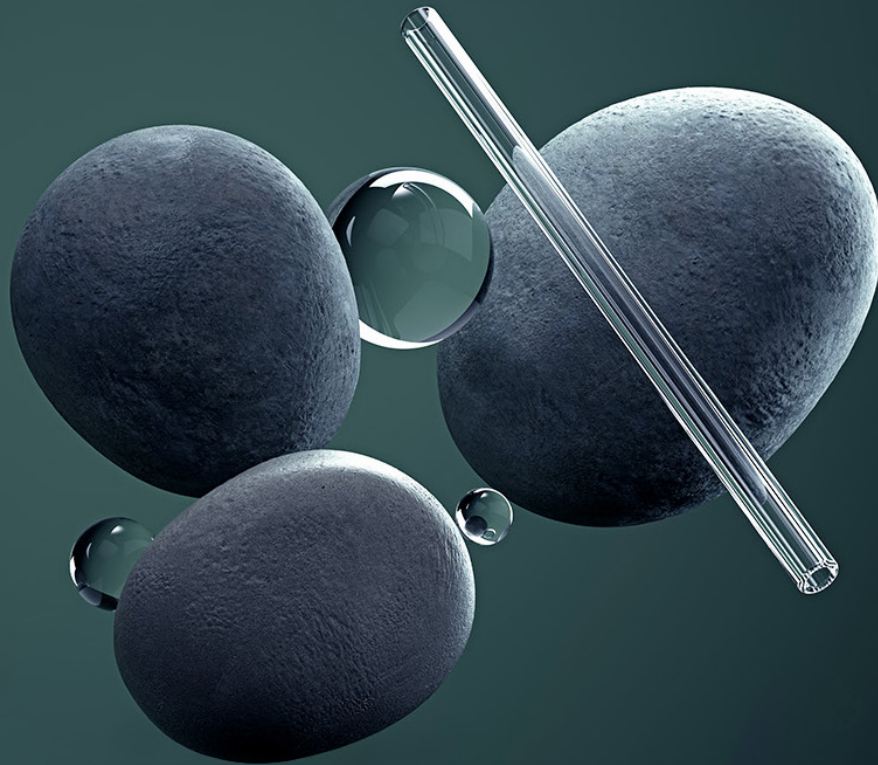
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Private equity turns to resiliency strategies for software investments

# Top trends in global private markets

2022 was a year of two halves for private markets, and 2023 continues to be uncertain. Leaders from McKinsey's Private Equity & Principal Investors Practice discuss the current state of the industry and the importance of portfolio value creation.

*by Alejandro Beltrán de Miguel, Gary Pinshaw, David Quigley, and Brian Vickery*



**After an exceptional 2021 for private markets,** 2022 was a year of two halves for the industry. The first half was robust. The second was relatively slower because of the lower availability of debt, rising cost of debt, and dislocation in asset prices. Also, many LPs faced overallocation challenges in their institutional portfolios, resulting in the denominator effect. These factors led to a year-over-year decrease in deal volume and fundraising. On the other hand, dry-powder inventory<sup>1</sup> spiked. And within asset classes, private equity and real estate had more challenging times in 2022 on various counts than private debt, infrastructure, and natural-resources strategies did.

Brian Vickery, a partner in McKinsey's Private Equity & Principal Investors Practice, discusses emerging industry trends and highlights from the 2023 edition of the firm's Global Private Markets Review<sup>2</sup> with senior partners Alejandro Beltrán de Miguel, Gary Pinshaw, and David Quigley.

## Regions, sectors, and strategies in focus

**McKinsey:** I'd love to get reflections on what you are seeing in your day-to-day interactions with your clients that might be different than what we've published in the *McKinsey Global Private Markets Review 2023: Private markets turn down the volume* report.

**Alejandro Beltrán de Miguel:** I will highlight four things. First, even though there is still a positive mood and outlook on what the future could be for alternative investing, my sense is that things are taking longer than expected. Some funds told us that the debt market will open up in the first quarter of 2023, there will be more deals, and the multiples will go down, but you actually see that this is taking a little bit longer than expected. Again, the mid- to long-term views are still positive, but there is a little uncertainty within the industry about how long it would take.

Second, it is hard to talk about the overall view of the industry right now. There are many different realities. Consolidation is really happening. There is a big difference between the best performers and the worst performers. We are serving a few midsize funds that are trying to raise money with probably not the best track record; fundraising is becoming very hard for them. Meanwhile, it is not that difficult for the top performers that have bigger—and probably fewer—funds.

Third, we are seeing completely different realities across geographies and asset classes. Europe is less developed, for instance, in venture capital and growth. However, if you look at the Asian and North American markets, they are growing, and there is more money coming into these asset classes. There is also a lot of appetite for infrastructure investing and private credit, as banks are reducing their exposure to the debt balance into the corporate sector. In terms of liquidity solutions, I agree there is more demand for secondaries, with a bigger pipeline and deal flow.

Fourth, firms are also focusing more on portfolio work and these types of assets.

**McKinsey:** Could you talk a little bit more about your final point about the importance of portfolio value creation? What are companies doing in the current environment?

**Alejandro Beltrán de Miguel:** In an analysis done a few years ago, we found that the key return differentiator was what firms do with the asset during the holding period.<sup>3</sup> More and more, we see more focus on portfolio work and how funds can improve performance during the holding period. Many funds that traditionally did not have strong operating-partner groups are now setting them up. There is much more active management by GPs of their portfolio companies. And we also see them focus on a bunch of

<sup>1</sup> "Dry-powder inventory" is the amount of capital available to GPs expressed as a multiple of annual deployment.

<sup>2</sup> "McKinsey Global Private Markets Review: Private markets turn down the volume," McKinsey, March 21, 2023.

<sup>3</sup> Unpublished McKinsey research.



# ‘Asia is now the second-biggest private-market region in the world at \$2.5 trillion, surpassing \$2.3 trillion in Europe.’

—Gary Pinshaw

completely different things, like data and analytics, sustainability, costs, and resilience.

**McKinsey:** Gary, what reflections would you like to share on how Asian private markets have fared?

**Gary Pinshaw:** Asia is now the second-biggest private-market region in the world at \$2.5 trillion, surpassing \$2.3 trillion in Europe. If we look within Asia, venture capital and growth are actually the largest in the world, even larger than in North America. Against the broader backdrop of a slowdown in the number of deals, fundraising, etcetera, on the ground here, we are seeing a lot of excitement and activity around infrastructure; environmental, social, and governance [ESG] topics; and energy transition. As the report demonstrates, ESG-agenda-directed funds now have surpassed \$100 billion of assets under management globally.

We are seeing a lot of investments happening, shifting from brown to green. This includes moving from traditional fossil-fuel businesses to more environmentally friendly ones, including things like refineries retransformed into, for example, ethanol plants. We are also seeing green business building. So investors are taking the lead and helping incubate, grow, and expand new businesses that are environmentally friendly at the core. We are

also seeing enabling technologies—and this could be from emissions and technology, investing in assets like that, and also from trading platforms.

Additionally, given the supply chain challenges both in Asia and across the world, as well as within energy transition, we are seeing efforts across various critical components of the supply chain and decarbonization. In a nutshell, Asia is a number of countries—some in the developing stage, some more developed. But we are seeing these pockets of real and significant investment right now, and I do believe this is here to stay for at least the next decade or two.

## North America weathers macroeconomic challenges

**McKinsey:** Looking at the data in Asia, it’s just a different private-market landscape than what we see here in North America. Asia seems to be a lot more oriented toward growth, venture, and building for the future versus harvesting and fixing what exists today. David, what are your thoughts on the current private-market landscape in North America?

**David Quigley:** Up to the point that the banking issues emerged, it felt quite like a new dawn. In late January, North America private markets started to

see the beginning of new processes. And I saw that grow throughout February, with quite a lot of focus across aerospace and defense, healthcare, life sciences, consumer goods, and certain parts of financial services—particularly payments, where we've seen quite a lot of interest. As you noted, the market had been down in terms of both processes and the number of participants in each process. We started to see both of those pick back up.

At this moment, I think we're all trying to get our head around what the banking issues will mean, particularly for ongoing interest rates and the availability of debt. I certainly agree with the point that we're going to see more private-credit opportunities in North America.

Separately, it's been a tough fundraising year. In some ways, when we look at the numbers, it feels like it's been tougher than the numbers would show. And I think part of that is just the tonality shift between LPs and GPs. Therefore, for GPs, this has felt like a tough round, even if data shows us that larger funds based in North America have seen relatively good success.

**McKinsey:** One of the questions I get asked most often is the influence of what's going on in banking in the private-market sector. The other thing I'm asked

is when deal volume will resume and how robust it is. In my view, we are starting to see "green shoots" in the area: more client inquiries are happening, and managers are doing more work on assets.

**David Quigley:** What I've not seen is processes that were under way getting halted as a result of what's happened with banking. I've had my eye pretty closely on that. So actually, processes are continuing to move forward. And I think people are weighing what is occurring carefully.

### **Finding opportunities in Asia**

**McKinsey:** Gary, when we look at the data over several years, private-market fundraising across Asia has fallen for several years in a row now—and particularly in China. How should global investors think about the opportunities to put money to work in Asia? And what's the story that those global fundraising numbers may be missing?

**Gary Pinshaw:** You're spot on. Fundraising for private markets in Asia has been in decline since 2017, when it peaked at close to \$288 billion. It was down to just over \$100 billion in 2022.

I think that must be looked at relative to the amount of dry powder. So there was a massive buildup in the

**‘What I’ve not seen is processes that were under way getting halted as a result of what’s happened with banking. So processes are continuing to move forward.’**

—David Quigley

amount of dry powder, or committed capital, that was ready to be deployed. Since then, especially in China, the slowdown in fundraising is actually due to the dry-powder volume. If you take China out of the equation, fundraising growth has been flat to positive in many other parts of Asia.

There are three key reasons for the decline in China. First is this focus on deploying the stockpile of capital. Second, 2018 saw China regulators limiting nonfinancial entities from borrowing capital to invest in private equity. The third reason is around the unfortunate ramifications of the COVID-19 pandemic, not only on human lives and livelihoods, but also on the inability to do road shows for fundraising.

So yes, fundraising is down. I would say that opportunities are there, and with valuations becoming more in line with what has been said in five- to ten-year trends, we've basically seen a decrease here in Asia from 14 or 15 entry multiples to 11 or 12. With the moderation in entry multiples, we do think there's going to be substantially more deals, at least, than in 2022 going forward.

You made the point earlier about how larger funds are disproportionately winning on fundraising; I think we have seen it in Asia. I remember how years ago, we'd say a megafund was above \$1 billion; now it is plus \$10 billion.

### **Advancing an ESG agenda in Europe**

**McKinsey:** The year 2022 was another strong one for ESG topics and private markets. We are seeing as much money as we've ever seen going into dedicated strategies for—and more money from traditional vehicles being oriented toward—ESG-agenda-type or ESG-agenda-friendly investments. In my view, the genesis of this momentum comes from Europe. Alejandro, how are practitioners that you interact with thinking about ESG topics and private markets? What might the rest of the world learn from the Europe's experience thus far?

**Alejandro Beltrán de Miguel:** Sustainability-related deals in Europe increased by 7 percent to a record of nearly \$200 billion last year. Venture capital deals made up 40 percent of this volume. While the push for ESG-related action is not

**‘Sustainability-related deals in Europe increased by 7 percent to a record of nearly \$200 billion last year.’**

—Alejandro Beltrán de Miguel

new, it has accelerated, given the macroeconomic context, geopolitical conflict, and higher energy prices. This means that industries need alternative energy sources and much more energy independence, and this will come with a lot of investment.

Regulations are also helping. There is the Inflation Reduction Act in the US, and Europe is pouring money into enabling the green transition of many industries. This will accelerate fundraising and deal volume. In Europe, most of the GPs are already incorporating ESG topics into their corporate policies, operating procedures, and investment decisions. LPs are taking this seriously when it comes to capital allocation processes.

What is even more interesting is the link between ESG topics and financial performance. People tend to believe there is no link between the two, but there is indeed clear correlation. We are increasingly seeing that while many funds may not be purely ESG-item focused, there is more emphasis on value creation and asset planning. Clearly, ESG items are becoming drivers of performance.

This will only grow going forward. More and more, we are seeing big companies trying to get into a different ecosystem and ensure green transitions of their businesses. They need capital, be it equity or credit. This is also creating big opportunities in the industry to really support clients' transitions throughout this time.

## What to watch out for in 2023

**McKinsey:** David, what are you spending the most time talking to clients about today, other

than the banking sector issues? How will these issues affect private equity in 2023?

**David Quigley:** If we look back at this industry, the metric that I like to review is the dollars raised each year rather than assets under management. Looking back over the course of the last decade, it tripled. I see that continuing. You can see that in buyout, and you'll see it in growth equity. Venture capital may take a moment, but I think you'll see it across these asset classes.

More near term, I do think we are on a path to returning to a more normal transaction market. Certainly, buyouts are up from the floor. I see a lot more global activity in carve-outs and take-private activities. A carve-out is a more complex transaction type, so I think we might see more focus on completing those carve-outs and getting them stood up.

I think everyone is expecting some adjustment on asset prices, particularly to accommodate what would appear to be a longer and higher interest rate environment. But there's a real sense that the dealmaking volume has to return, in a way. This industry functions very much on the turnover of assets. To that extent, we may see some longer holds out of this period. I think we're seeing that offset by managers placing more focus on alpha generation in the portfolio. I don't know yet that we can call the number on overall returns. Finally, the market that is likely to take the longest to come back, but when it comes back will come back fast, is software-based investing.

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# Where could \$374 billion in dry powder go? Six themes to watch

Private-capital activity in software will likely pick up after a short-term dip. Here are the key considerations.

*by Christian Behrends, Sébastien Chaigne, Julien Didi, and Alexander Rajko*



**Private capital loved software**—or it did for about a decade, during which capital deployment skyrocketed.

In more recent quarters, software markets have reflected global macroeconomic uncertainty. Publicly listed companies' multiples swooned; access to debt markets tightened; and private markets continued to hold large amounts of dry powder. Developments in banking that have affected major tech-financing entities may also affect capital raises for software.

But tech is only becoming more important in business, while also becoming more complex. Technology continues to blossom and is being used to transform operating models, increase efficiency, boost innovation, and address pressing challenges such as climate change. It has also become more complex as technological advances have stimulated new waves of software development. Examine, for instance, the leaps in fields such as fifth-generation technology, AI, automation, and edge and cloud computing.

Macroeconomic trends suggest that cybersecurity, payments, industrial software, human capital management, supply chain management, and data and analytics will be especially significant for the software sector in coming years.

### **A ten-year streak of growth**

Private capital in software grew by more than 24 percent per year, even doubling from 2020 to 2021 as the sector recovered from the acute phase

of the COVID-19 pandemic and completed deals that had been postponed. Our analysis shows that investments in 2022 were driven by large private equity (PE) transactions, including three valued at more than \$10 billion.<sup>1</sup> However, growth-focused private capital shrank from 2021 to 2022. Two major investors became more watchful of valuations and cautious about deploying capital. They ended up deploying less than 10 percent of their available funds in 2022 (Exhibit 1).

### **Multiples have grown more quickly for software companies than for nonsoftware peers**

Demand for software from clients of all sizes has increased steadily with digitalization, giving the sector a structural boost. The rise of software-as-a-service (SaaS) business models also builds in recurring revenue.

Software is very good at generating cash thanks to its scalability. Its connectivity enables remote operations; processing power and visualization and dashboard capabilities support accelerated decision making.

These characteristics have buoyed software multiples (here, we use enterprise value divided by revenue) since 2005, reaching a peak of 8.3 in 2021 after the acute phase of the COVID-19 crisis. Recent increases in the cost of capital have compressed technology company multiples, which remain significantly higher than those of nonsoftware companies (Exhibit 2).

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<sup>1</sup> Chavi Mehta and Krystal Hu, "Elliott, Vista Equity take Citrix private in \$16.5 bln deal," Reuters, January 31, 2022; Chavi Mehta, "Thoma Bravo cuts takeover offer for software firm Anaplan to \$10.4 bln," Reuters, June 8, 2022; Ron Miller, "Zendesk drama concludes with \$10.2 billion private equity acquisition," *TechCrunch*, June 24, 2022.

# Developments in banking that have affected major tech-financing entities may also affect capital raises for software.



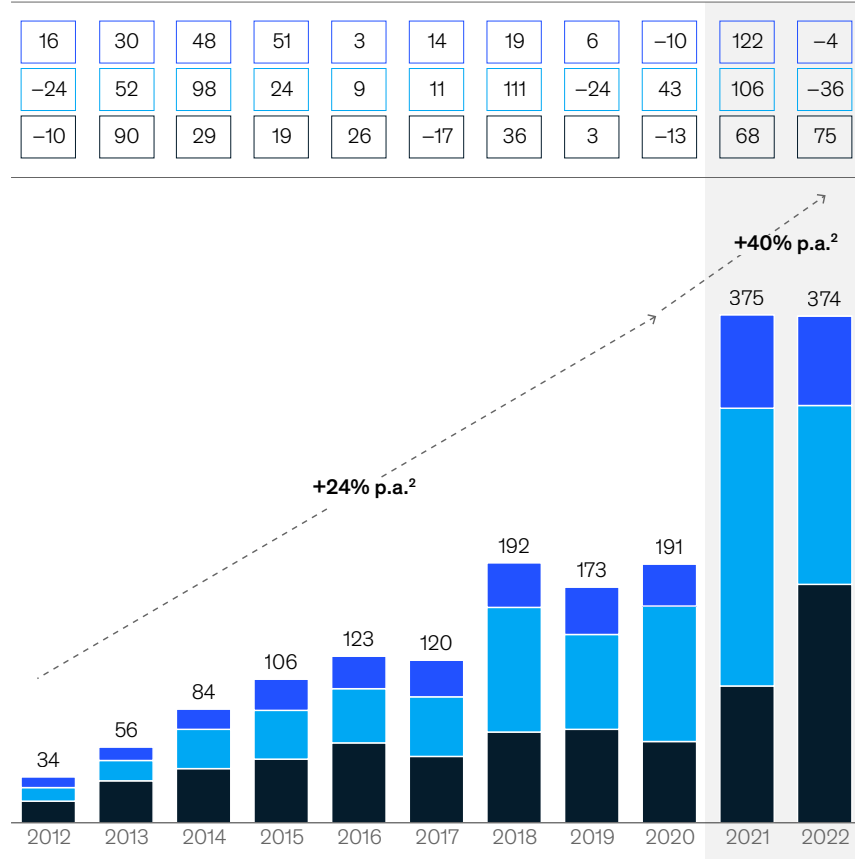
Exhibit 1

## Private capital in software has a ten-year record of growth.

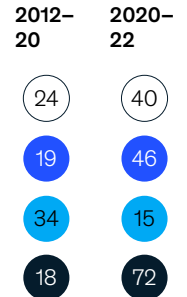
Global private capital invested in software 2012–22,<sup>1</sup> \$ billion

■ Private equity (PE) ■ Growth ■ Venture capital (VC)

YoY growth, %



CAGR, %



<sup>1</sup>PE includes buyouts. Growth includes growth, expansion, and late-stage VC. VC includes early-stage VC and seed-round investments.

<sup>2</sup>Per annum.

Source: Pitchbook, completed private equity deals, software, 2012–22

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### Significant dry powder is set to fuel future software investments

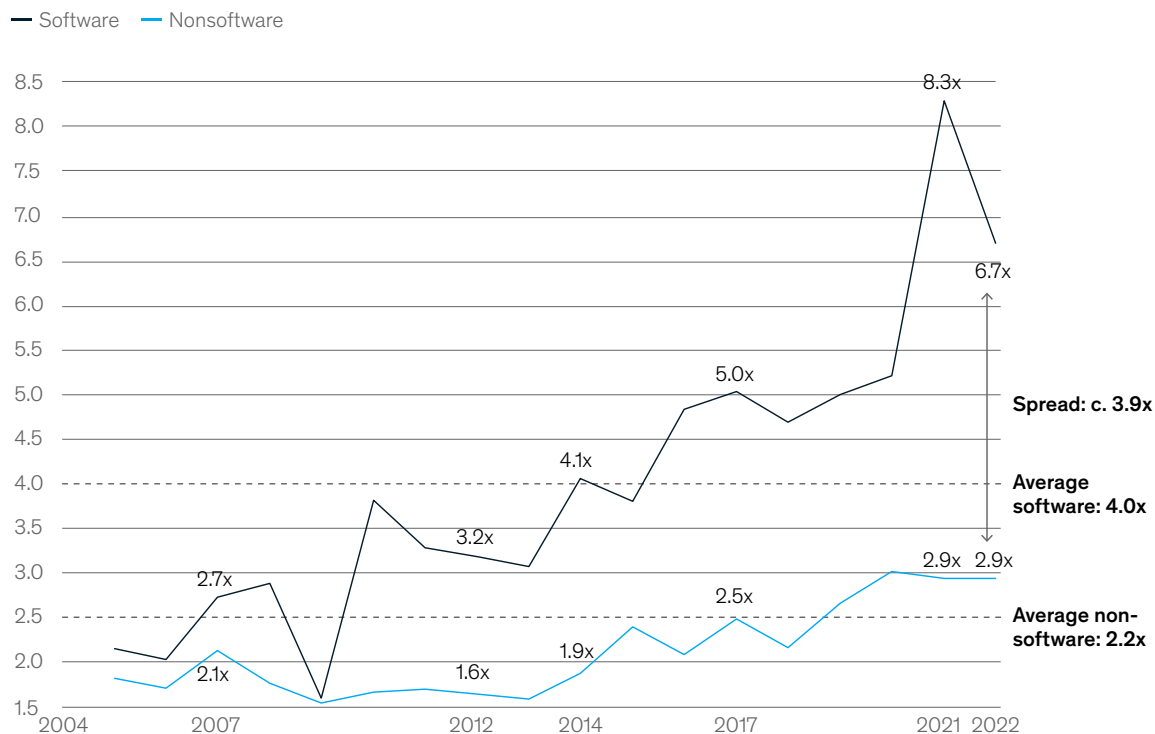
In pursuit of outside returns, a significant amount of dry powder in tech-focused PE funds has been channeled toward software. After slowing in 2021, growth in dry-powder levels jumped again, rising by \$68 billion from 2021 to 2023. This suggests continued interest in software investments. However, the impact of challenges in the banking sector in 2023 remains unclear (Exhibit 3).

### Six areas that may shape the future of the sector

No one can predict the future. But decision makers interested in software can use a set of criteria to identify areas that will become more important. Decision makers can consider companies that serve global demand, which is projected to grow for structural reasons; companies that help businesses—particularly small and medium-size enterprises (SMEs)—by providing protection and productivity

## Software multiples have grown more quickly than nonsoftware multiples.

### Median global multiples (enterprise value and sales) in private capital transactions



Source: Pitchbook, private equity–owned software companies (buyouts) with a value greater than \$100 million

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aids; and companies that occupy fragmented ecosystems. With those considerations in mind, here are six areas that seem likely to have an outside commercial economic effect.

**Cybersecurity** is increasingly relevant because of the rising number of threats and attacks. Regulatory requirements have also sprung up in response to those incidents, which would likely make the sector resilient. In informal interactions, chief investment officers (CIOs) say they are on the hunt for software offerings with high short-term ROI, and demand is growing from both enterprise and SME customers. But cybersecurity talent is scarce, so customers rely heavily on independent software vendors and tech services partners as providers of services

and solutions. The ecosystem is also fragmented, which paves the way for a strong cybersecurity company to grow through acquisitions.

**Payments software** fuels everything from online checkouts to cryptocurrencies, so the market is large, with accelerating growth and a variety of scalable products. What's more, payments software has become a significant creator of value in the financial industry, especially compared with traditional banks. This area also continues to draw a high level of interest compared with its fintech counterparts.<sup>2</sup>

**Industrial software**, such as product design and engineering solutions, is growing quickly, partly because enabling technologies such as the Internet

<sup>2</sup> Mary Ann Azevedo, "Payments remain the darling of the fintech space," *TechCrunch*, January 22, 2023.

Exhibit 3

## Significant dry powder for software investments remains.

Dry powder,<sup>1</sup> \$ billion

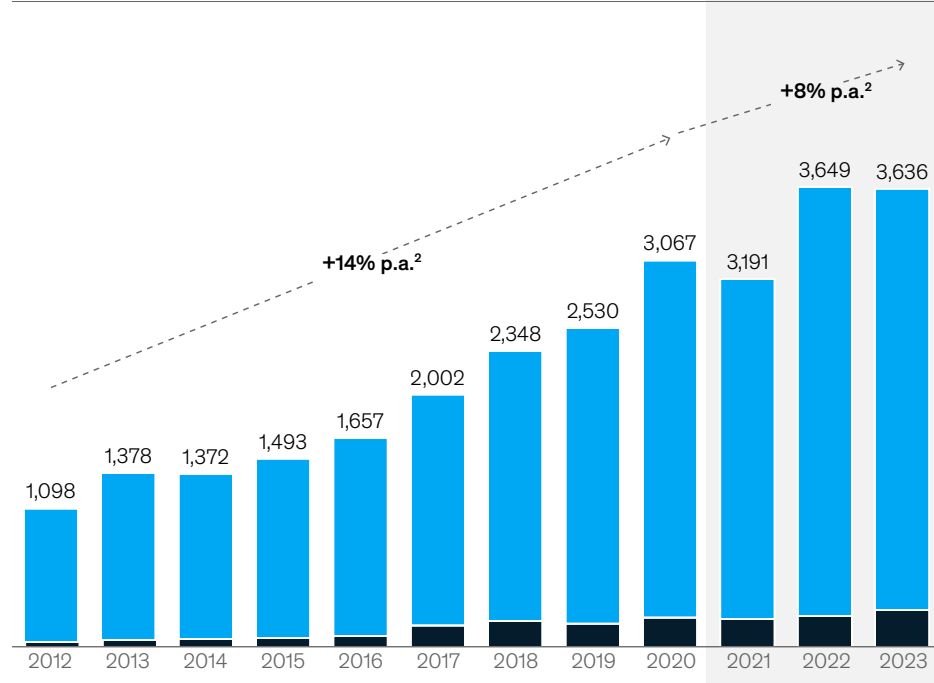
■ Software ■ Nonsoftware

YoY growth, %

-4	25	-1	9	10	17	17	9	21	5	15	-2
-9	56	14	9	26	95	20	-10	26	-4	10	20

CAGR, %

2012–20	2020–22
14	8
13	8
26	10



Software: dry powder to capital invested ratio, %

106	100	75	65	71	141	106	106	122	59	65	N/A
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<sup>1</sup>Includes private equity, growth, and venture capital as of March 2023.

<sup>2</sup>Per annum.

Source: Preqin

McKinsey & Company

of Things and edge and cloud computing have grown enough to boost the number of uses for it. A related reason is that customers' needs are evolving as they look to develop digital capabilities in addition to their hardware products. Industrial software has responded to this demand with solutions such as democratized computer-aided engineering, a new generation of product life cycle management

solutions, and smart manufacturing platforms dedicated to midsize customers.

The market is still fairly fragmented, and there will likely be opportunities to transform legacy entities, vertically integrate, or implement subscription-based business models, which are still subscale in industrials.

*Human capital management* software is growing as HR continues its evolution from a personnel management function to a cross-functional business partner that integrates talent management, employee experience, employee productivity, and talent processes and service delivery. As the function evolved, so did the software that supports it. HR software now encompasses an ecosystem of often interconnected solutions that respond to changes in customer and regulatory demands. This market segment may remain resilient even in times of uncertainty because most CIOs plan to maintain essential HR-related spending.<sup>3</sup>

*Supply chain management* has become an enduring concern after the onset of the COVID-19 crisis. Even SMEs are increasingly expressing interest. The market for supply chain software will likely grow in the long run because of the need for supply chain optimization, end-to-end integration, and automation in areas such as productivity, cost, and sustainability.<sup>4</sup>

*Data and analytics* is a broad umbrella that covers areas such as data privacy—which our research shows has seen double-digit growth in investments and revenue—and data management. This part of the market is growing thanks to innovations in areas such as cloud infrastructure, AI, and machine learning. Structural changes such as efficiency gains from data operations also add fuel. These solutions will likely be buoyant even during an economic downturn because they provide high short-term ROI for CIOs.

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Available data suggests that the slowdown in software investment is short-term. Cybersecurity, payments, industrial software, human capital management, supply chain management, and data and analytics may be the areas to watch for the software sector.

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<sup>3</sup> "Private equity turns to resiliency strategies for software investments," McKinsey, March 29, 2023.

<sup>4</sup> "Building a digital bridge across the supply chain with nerve centers," McKinsey, January 22, 2021.

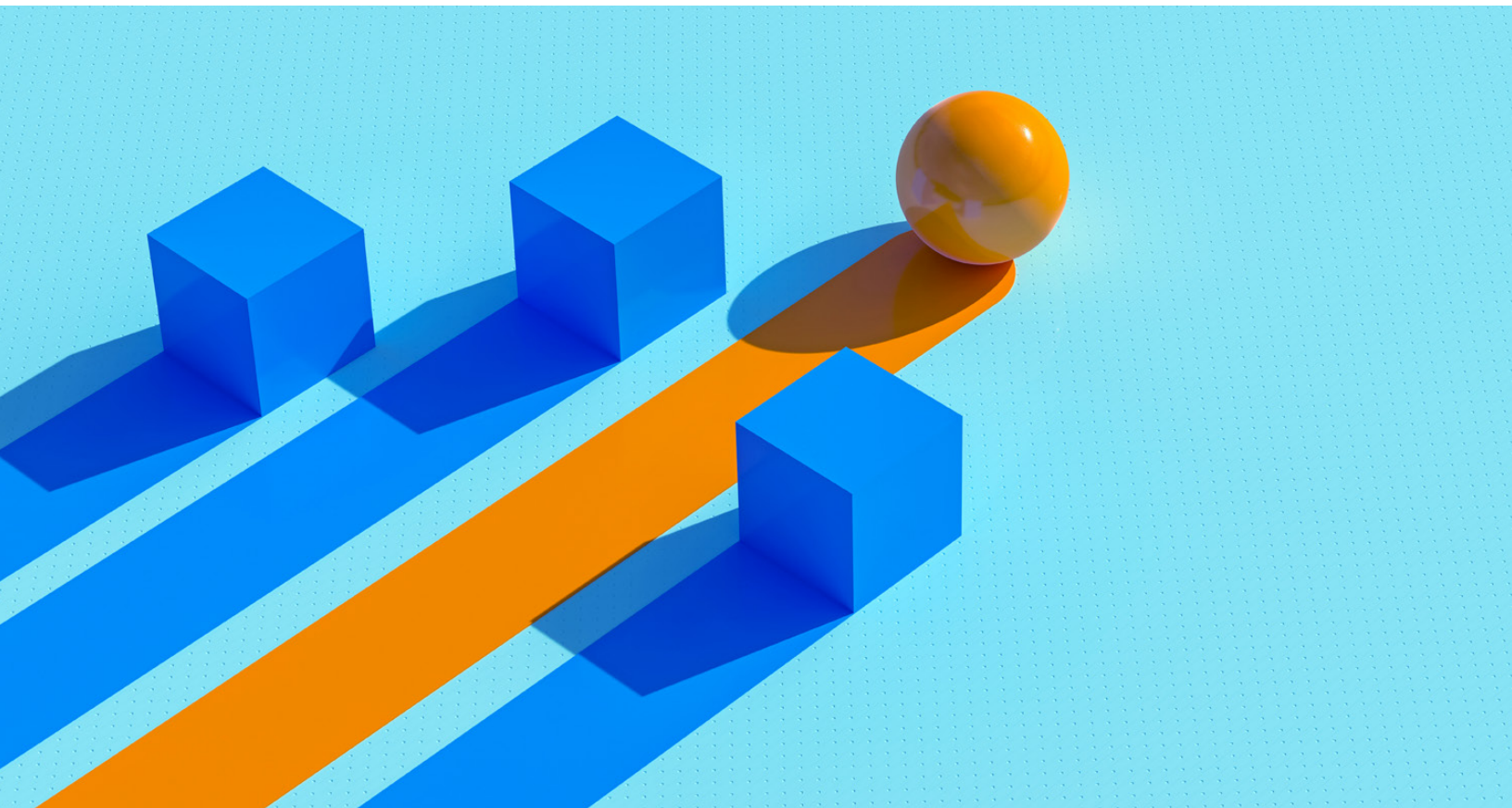
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# CEO alpha: A new approach to generating private equity outperformance

To create and sustain high performance, private equity sponsors must make building distinctive private equity CEOs a priority. Here's how.

*by Marla Capozzi, Sacha Ghai, John Kelleher, and Kurt Strovink*



**Private equity (PE) sponsors** and portfolio companies continue to drive operational improvements as a crucial lever for realizing outside returns.<sup>1</sup> But there is another important enabler of PE value creation—what we call CEO alpha, or the value created from CEOs' outperformance. If the PE portfolio company CEO, who calls the shots and makes the strategic decisions, lacks the right leadership capabilities, targeted operational improvements are less likely to be sustained or may never materialize.

McKinsey research shows that top-quintile CEOs have historically delivered total shareholder returns that are 9 percent above industry peers in each year of their tenure. In industries such as financial services and automotive, these high-performing CEOs have achieved excess total annual returns of 16 percent on average.<sup>2</sup>

Against this backdrop, it's clear that CEO alpha is an idea whose time has come—or is maybe even overdue—in the rapidly evolving PE industry. Private equity sponsors generally agree. They increasingly cite leadership as an important source of EBITDA growth and value creation alongside the usual performance levers (the targeted operational improvements as well as technology innovation, financial leverage, and multiple expansion). Indeed, in a 2022 survey of general partners, 94 percent say they believe PE portfolio company leadership contributed an average of 53 percent toward investment returns.<sup>3</sup>

In our own conversations and work with PE CEOs and sponsors, all acknowledge the importance of CEO alpha and agree that they could, and should, do more to build PE portfolio company CEOs' capabilities to realize outside returns. Industry research suggests the same. For instance, among the general partners polled in the 2022 survey,

8 percent say they are committing money, 27 percent say they are deploying resources, and 36 percent say they are putting in the time to optimize PE portfolio company leadership.<sup>4</sup>

What's more, playbooks for intentionally building leadership excellence in private equity have been scarce, which represents a huge missed opportunity: investing in human capital now can pay off over the longer term.

To achieve CEO alpha, PE portfolio company CEOs need distinct capabilities—those that go beyond typical leadership traits found among the best public company CEOs and account for PE-specific time horizons for investment and exit and speed to impact. In this article, we provide an overview of those capabilities and the ways to achieve them. Whether the CEO is new or an experienced leader, an expert practitioner of PE, or someone with a more diverse background, the essentials of CEO alpha can be customized and adapted to meet their unique context and opportunities.

## Why CEO alpha matters in private equity

PE portfolio company CEOs face unique challenges in an already complex role. The level of autonomy in decision making, the degree of focus on EBITDA, and the way that boards govern are different in PE portfolio companies than in other companies. "There is less freedom within strategy setting," the CEO of a PE-owned healthcare company told us. "Where to compete is also more tightly defined because of the time-bound nature of investments." Another PE executive, based in Canada, noted that EBITDA is a central theme in all conversations among the portfolio company CEO, the board, and the general partners.

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<sup>1</sup> Markus Biesinger, Çağatay Bircan, and Alexander Ljungqvist, *Value creation in private equity*, European Bank for Reconstruction and Development, working paper 242, April 28, 2020.

<sup>2</sup> McKinsey analysis.

<sup>3</sup> Peter Callas et al., "Leadership alpha in private equity," Teneo, November 16, 2022.

<sup>4</sup> Ibid.



Changes in the global economy and the broader business landscape have only made the job of these CEOs harder. Private equity is not immune to cyclical economic challenges such as the elevated risks of a US recession, high interest rates, and inflation. It also faces digitization, sustainability, the changing geopolitical order, and other disruptive trends that are likely to have profound and lasting consequences on the investing ecosystem. These headwinds, coupled with the volatility in financial markets, slowing IPO activity, and falling tech valuations, are weighing on PE deal flow, fundraising, and performance.

In addition, PE portfolio company CEOs tend to come from varied backgrounds. Some may have a science or technology background or previously led public companies. Often, company founders grow a small business to a certain level, take in private capital, and suddenly find themselves leading a midsize company with very different organizational needs, which they may not have the necessary expertise, experience, and PE-specific core competencies to navigate.

Most leadership development programs are not tailored to the unique needs of this community of CEOs. In fact, in our experience working with PE CEOs, we have not encountered many such

programs that have been widely adopted in the industry. The few programs that do exist are usually the result of an enterprising sponsor that is beginning to build a unique capability.

### Achieving CEO alpha in private equity

At the heart of the concept of CEO alpha is the belief that leaders can systematically develop the capabilities required to achieve outperformance. Indeed, PE portfolio companies should design their capability building programs with the essentials of CEO alpha in mind (see sidebar, “The essentials of private equity CEO alpha”).

A focus on three essentials of CEO alpha, in particular, could help PE portfolio company CEOs address some of their toughest challenges and realize even greater impact: talent management, PE performance management, and strategic planning.

#### 1. Talent management: Building a fit-for-purpose team

Talent management is a top concern within private equity these days. This reflects, in part, the ever-changing competition for talent, but it also reflects the unique executive profiles that PE portfolio company CEOs are targeting, as well as the number

## The essentials of private equity CEO alpha

**To achieve CEO alpha**, PE portfolio company CEOs need distinct capabilities—those that go beyond typical traits found in all leaders. Below we highlight ten such essentials:

- talent management to support the investment thesis
- private equity-style performance management and dashboards
- strategic planning within a three- to five-year time horizon
- board and sponsor governance
- advanced financial decision making
- rapid earnings and cash acceleration
- profit dissection and resource allocation
- inorganic growth to support the investment thesis
- value creation through frontier technologies
- exit and monetization preparation

of roles they must fill. For example, one PE portfolio company told us that 37 roles among thousands of employees in the organization drove 80 percent of its EBITDA, which prompted senior leaders to change time allocation, managerial focus, and apprenticeship priorities for employees.

Much more than public company CEOs, PE portfolio company CEOs must build their management teams to execute a specific investment thesis. They must find and hire leaders who are execution focused, decision oriented, financially astute and motivated, and able to make consequential decisions quickly. What's more, PE portfolio company CEOs often have to build and rebuild their teams. For example, on average, they are responsible for filling between 30 and 40 percent of level-two positions (heads of divisions) and 50 to 65 percent of level-three positions (vice presidents).

As one PE executive said in an interview, "Outside of M&A, people decisions are most important, and getting them right is critical." McKinsey research supports this point: CEOs who frequently reallocate talent are 2.2 times more likely to outperform their peers, and those that get talent right in the *first year* achieve 2.5 times the return on initial investment.<sup>5</sup>

How can PE portfolio company CEOs begin to build capabilities in talent management? Keeping the investment thesis and time horizons in mind, they'll need to identify the roles that will create the most value for the portfolio company and then match talent to value (whether from inside or outside the company). As one PE leader advised, "Do it fast, and early in your tenure."

PE portfolio company CEOs will also need to institute performance management processes that set "reverse hockey stick" targets (rapidly making decisions that drive the greatest financial benefits the soonest) and make it easier to monitor

organizational performance and address unfavorable variances. For instance, a PE portfolio company may expect 60 to 80 percent of all run-rate benefits targeted over a three-year period to be captured within the first six to 12 months. The performance management process must allow for private equity–style consequence management and provide upskilling opportunities for leaders.

## **2. Cascaded performance: Using financial and operational dashboards to run the business**

PE portfolio company CEOs must be on top of every performance metric at a level of detail unfamiliar to many public company CEOs. Given the short time horizons for meeting value creation goals, they are expected to continually monitor performance, spot variances, and pivot quickly as needed. It's important, then, for PE portfolio company CEOs to set up robust performance dashboards (and rules for using those dashboards) that take both people and purpose into account.

At a minimum, the dashboards should enable standard reporting, risk management, and identification of key opportunities. They should yield detailed and dynamic performance reports that take pricing, safety, quality, speed, satisfaction, efficiency, and integrated economics into account. The teams using these dashboards should be clear about their roles and operate within the scope of those roles. And CEOs should ensure that dashboards are used in all decision-making discussions across the organization.

This detailed, holistic approach can yield positive results: one PE portfolio company was looking at controlling high labor costs, but a closer look at the company's integrated performance dashboards revealed that a lack of world-class safety was actually a big factor in the increased labor costs. With this information, the PE portfolio company CEO was able to successfully divert resources to address both safety and cost issues.

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<sup>5</sup> Claudy Jules, Vik Krishnan, Vivek Pandit, and Jason Phillips, "A playbook for newly minted private equity portfolio-company CEOs," McKinsey, September 24, 2021.

### 3. Strategic planning: Achieving far more in far less time

All CEOs must help to define their company's vision and strategy, but the process is different for PE portfolio company CEOs. The PE sponsor typically performs rigorous due diligence on a portfolio company, often over a six- to 12-month time frame, and formulates a specific investment thesis. The PE portfolio company CEO is then hired to execute the sponsor's thesis in a timely manner. That CEO must partner with the PE sponsor and the board on strategy, ensuring that any changes made will create value within the industry's typical three- to five-year time horizon for value capture. To achieve CEO alpha in strategic planning, PE portfolio company CEOs must embed strategy into their day-to-day work—that is, in every discussion with sponsors, teams, and other key stakeholders and in every review of performance outcomes and financial and operational results. Strategic actions in this context must be bold, actionable, and executed quickly. “Public companies build aspirational, long-term, often vague visions,” the CEO of a private debt firm told us. “But PE companies need to have clear, tangible short-term decisions. As a PE CEO, you are almost always given the strategy as part of the value creation plan and expected to refine and execute.”

With the essentials of CEO alpha in mind, sponsors can review their portfolios against their value creation plans to identify where the biggest opportunities and capability gaps are and create fit-for-purpose capability building programs for PE portfolio company CEOs.

The prevailing research and our work with hundreds of PE company sponsors suggest that an increasing number of PE firms are doing just this. They are prioritizing CEO development and leadership effectiveness as the means to generate outperformance. They are starting to put just as much emphasis on recruiting, onboarding, peer learning, succession planning, and performance management as they do on other key levers of value creation.

In short, they are beginning to target the essentials of CEO alpha. And the sponsors that get it right can build portfolio companies that attract and develop topflight CEOs and seed the industry with even more high-end talent for the future.

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# How Blackstone is helping to build India's next generation of global companies

Blackstone Private Equity's head of Asia, Amit Dixit, reveals elements of its long-term success in India. Hint: it requires the right mix of ownership, technology, and talent.

*by Vivek Pandit*



*This interview is part of a series of India Ahead conversations with visionaries, future builders, and thought leaders on what it will take to drive India's growth over the next 25 years.*

**A combination of** investments in India and a doubling down across Asia appears to be a successful strategy for Blackstone's Private Equity group. In India, its portfolio has a total market value of \$60 billion. Marquee deals include purchasing a majority stake in IT service provider Mphasis, acquiring the glass packaging business of Piramal Group, and exiting from business service provider Intelnet for \$1 billion (in 2018).

Leading the program is Amit Dixit, Blackstone's head of Private Equity in Asia, who has been with the company since 2007. In a conversation with McKinsey's Vivek Pandit, Amit discusses how the Indian market has evolved over the past decade and Blackstone's approach to building value over time by using innovative technology and world-class talent. The following is an edited version of their conversation.

**McKinsey:** Blackstone Asia's record is more India-centric than that of most regional funds. What makes you bullish on India?

**Amit Dixit:** India as a country offers scale. We have \$60 billion in assets across private equity and real estate in India. Very few countries in emerging markets offer that scale. Second, India has a combination of a large domestic market and a large export opportunity. Again, it's a rare combination to find both in emerging markets, and we have played both. We have made several investments in export industries where India has a global competitive advantage—software, services, pharmaceuticals, and auto components—and several investments domestically in consumer, financial, healthcare services, and, biggest of all, real estate. These strengths are in addition to well-known aspects of India, including democracy, the rule of law, a large middle class, and our high GDP growth rate.

**McKinsey:** What would you say are the main contributors to Blackstone's success in India?

**Amit Dixit:** When I look back on what has worked, I think it's a few things. First, because our strategy is to be a value-adding investor, we need deep domain focus. We've bought and sold mostly in the same sectors for the last decade, and we haven't deviated outside of that, so we have the right people, the right network, and the right domain expertise.

Second, we have learned to be a builder of businesses, not just a buyer of businesses. If the opportunity is only to buy and sell, that's not for Blackstone. We buy to build, and in every situation we are looking for an opportunity to build the platform we have. That is something we believe is unique and has now been part of our DNA for over a decade.

Third, it's all about alignment and partnerships with management, fellow shareholders, founders of companies, promoters, and owners. You have to row in the same direction and be a trustworthy, transparent partner. We dedicate an inordinate amount of emphasis to get that partnership and alignment right. One way to do it is to make sure everybody is completely aligned on the equity value creation plan. We are very transparent as to what our objectives are and what the investment plans are, and we agree on that up front.

Next, I would say we've learned, in the last three years, that technology is no longer a vertical. Technology is a horizontal. Every business is a technology business. If you get the technology transformation right, you get two benefits: you get accelerated revenue growth because you're on trend, and, importantly, you get a very strong multiple upon your exit at the IPO because you future-proof the business, and the next investor is seeing a ten-year runway. For example, we converted Sona Comstar from a combustion engine auto company into an electric-vehicle company, Mphasis from a traditional outsourcing company into a cloud migration company, and Aakash Educational from a physical-education company into an "edtech" company.

The last point is about management. The talent pool in India and the quality of management are very strong. We have learned it is key to align the talent with the shareholder and customer objectives. We

think of ourselves as almost a glorified head-hunting firm because at all times we're ensuring that the right people, with the right alignment, are in critical leadership roles in our companies. And when I say "leadership role," I don't mean just the CEO or CFO. Typically, our management teams have equity programs extending to 150 to 200 people. You need to get that right because if you get the management right, magic happens. The change in behavior between that same leader who was earlier a manager and is now an owner is dramatic. We have recognized the power of ownership and brought that equity ownership culture into the Indian management teams, and that's worked well.

**McKinsey:** For a long time, a lack of adequate exits and options deterred some investors from India. How does the Indian private equity market stack up from a risk–reward perspective, and how has Blackstone adapted to account for this?

**Amit Dixit:** There have been two big changes in the market over the last decade. One, the shift from minority investing to what we call control deals, where a foreign investor owns more than 51 percent of the company. When Blackstone started in India, it was a rarity to have a control deal. It was almost a 100 percent minority investment market in India. If you fast-forward to today, we can see that control deals are becoming more common. And both control and minority deals are now much larger in size than they used to be. That's a fundamental change.

The second big change is exits. To your point, it was always a great market to invest in but a difficult market to harvest. If you talk to the limited partners or investors, that would have been the most common complaint five years back. That has changed because the markets in India actually have done well, and not just the IPO market but the M&A market as well. We have seen exits from dividend recaps, from IPOs, secondary sales, trade sales, private equity sales, and multiple exits.

That's a big change in our strategy. We have always focused on being a business builder and having a very active large stake in a company. What that gives us is exit optionality. It's important in emerging markets to have exit optionality because IPO markets can be few and far between, as you saw

between 2011 and 2013 in India, when the IPO market slowed down. Even in the last six months, we're seeing IPO windows close. If you're a minority investor, you're largely stuck with an IPO exit, but having multiple options and exercising those options make a big difference. The Indian market is becoming deeper, larger, with more exits.

**McKinsey:** There is tremendous political and economic volatility today. How are private market investors like Blackstone responding to this uncertainty?

**Amit Dixit:** I would say there are a few aspects to this. First, you don't have to put your head in the storm. We tend to be long-term investors and don't have to either invest or exit anything right away. We don't get caught up in the short term. I think that's important, and, thankfully, our capital gives us the flexibility to do so because we raise long-term capital.

Second, in many businesses, inflation is so hard to pass on to your customers that it's important to focus on costs. You have to balance the growth agenda with the productivity agenda. You have to make sure that your business is efficient because your customers expect you to do so, and the benefit will come when the inflationary environment eases. At that time, you will reap the rewards of being very prudent in this environment.

Third, there is an opportunity to, potentially, make acquisitions or be more aggressive in gaining market share. We have an acquisition conversation going on in every one of our companies or, in some companies, multiple acquisition conversations. We think it's a very good environment for talking acquisitions and playing offense to increase market share.

In terms of new investments, we are navigating the environment with patience and dialing up on quality. As a US dollar investor, the world does look a lot cheaper. In most markets, keeping India aside, investors are now trading at a discount to the ten-year averages of the long-term market. We want to dial up on the quality, and quality is always expensive. It won't be cheap, but it's cheaper than it used to be 12 months back.



**‘We can see that control deals are becoming more common. And both control and minority deals are now much larger in size than they used to be. That’s a fundamental change.’**

That’s where being a builder comes in, because whatever you are buying will be relatively expensive in somebody’s eyes unless you have a differentiated point of view on what you build, not what you’re buying. In our investment committee approval meeting, we have that value creation plan—what we call the business building plan—up front. Many years back, those plans would come into place six months after the investment or even a year after. Now, they come six months before the investment. As soon as an investment closes, you hit the ground running.

**McKinsey:** As someone who works closely with family businesses and entrepreneurs in India, what advice would you have for families seeking to partner with private equity firms and build high-performing organizations?

**Amit Dixit:** We have, over the last 15 years, partnered with many family-owned businesses. It’s important to have the business governance ready. Good governance is good business. What do I mean by that? Have a well-reputed accounting firm do your audits, have a diversified board, have the right people, have proper financial controls in place, and put an ERP [enterprise resource planning] system in place. For any kind of activity you want to do—whether it’s an IPO or private equity—it’s just good governance. Even growing your own business is very hard to do if you don’t have this basic infrastructure in place.

Second, what has contributed to Blackstone’s success is what is going to contribute, and is contributing, to the success of family-owned businesses: attract, retain, and encourage best-in-class management. I cannot emphasize how much of a difference a great manager versus a good manager can make. It’s a very big point, but for great managers to succeed, you have to give them the operating freedom, the empowerment, and the ability to execute, and you do not second-guess the strategy. That requires a certain amount of framework alignment, and I think the onus is on family businesses to make it work.

The third thing, I would say, is to focus. India is growing and has become very competitive and very organized. There are multiple competitors in each space. You have to put in your 150 percent no matter where you are. Otherwise, you cannot even have a shot at winning. Pick your spots, pick your focus, and don’t have that diversified sort of approach. Yes, you will have to make sharp choices. It’s not easy.

**McKinsey:** Looking ahead, where do you see the greatest investment opportunities in India over the next five to ten years?

**Amit Dixit:** From the Indian perspective, broadly, there can be two buckets: domestic and exports. In the domestic area, the digital consumer is a long-term theme. I’m purposefully using the term “digital

consumer” and not “consumer” because I think the trend of consumption is becoming digital, whether it’s consumption in healthcare or consumption in retail moving to digital channels. Another big theme is the aging population and the impact on life sciences and healthcare. And the growth of financial services in India as GDP grows is expected to drive Indian savings away from real estate, gold, or other physical assets into financial assets. So, financial services is another multidecade trend.

In the exports area—opportunities where India has a global competitive advantage—exporting software

services is a classic. It’s an almost \$200 billion export industry for India. It is a big sector for Blackstone itself, both in private equity and real estate or real-estate tenants. We have also had very strong success now with manufacturing, where the opportunity—what we call the make-in-India opportunity— is much bigger than what we have tapped. India can be a manufacturer of a lot more goods, including pharmaceuticals and chemicals.

These are some of the themes I would focus on, both domestically and from an export standpoint, for a ten-year point of view.

**Amit Dixit** is senior managing director and head of Asia for Blackstone Private Equity. **Vivek Pandit** is a senior partner in McKinsey’s Mumbai office.

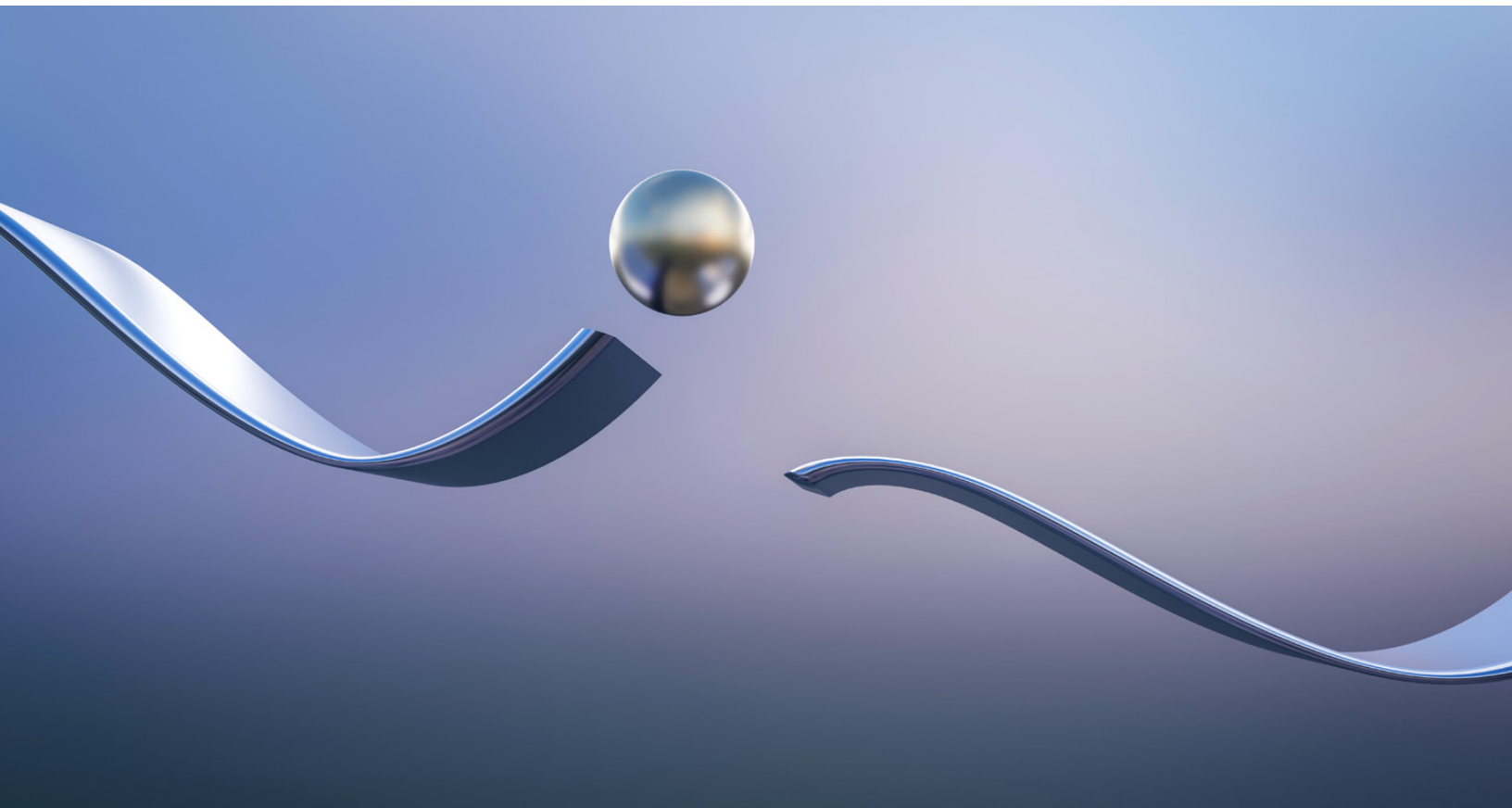
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# A winning strategy for growth investors at a time of uncertainty

Market dynamics are forcing growth equity investors to rethink their portfolio engagement model. Here's how they can thrive in a challenging environment.

*by Alexander Edlich, Wesley Hayes, and Kayla Miele*



**Growth equity has become** one of private equity's fastest-growing segments in recent years, but today's market uncertainty has slowed that momentum: 2022 was a year of disruption. Investors faced a multitude of downside risks, including geopolitical tension, energy and food scarcity, rising inflation and interest rates, stock market volatility, and supply challenges triggered by the war in Ukraine and the legacy of the COVID-19 pandemic. At the present point in the economic cycle, there is no clear-cut path to expansion, profitability, or resilience.

This period of change should encourage growth investors to rethink their models of engagement with portfolio companies. Such investors can coach them through the disruptions that lie ahead, mitigate the risks they face, and steer them toward long-term optimal growth. In short, they can educate and reinforce the founders and CEOs of these companies, many of whom have never led an organization through an economic downturn.

Especially now that there is some clarity around interest rates and other market dynamics, growth investors can help their portfolio companies survive the downturn in three ways. First, they can review the entire portfolio and divide its companies into different categories based on the degree to which market volatility has affected them. This classification will help identify the companies most in need of support. Second, investors can adopt a number of value creation levers to get these priority companies on the path of optimal growth. Third, they can invest time and resources to build the right talent and capabilities not only in their portfolio companies but also in their own companies.

### **From growth at all costs to optimal growth**

Diverse institutional investors and multimanagers have been drawn to growth equity's high growth and returns potential over the past few years because the investable universe of appropriate companies has expanded substantially, primarily as a result of substantial funding for venture capital. Thanks to

this expansion of the investable universe and the increasing returns for growth equity, 2021 was a record year for the strategy: fundraising touched \$132 billion globally—56.5 percent year-on-year growth. Across the United States and Europe, the deal count for growth equity and venture capital reached approximately 30,000, making 2021 the most active year on record.<sup>1</sup>

Since then, the liquidity tailwinds powering growth equity's fundraising and capital deployment spree have showed signs of waning. According to our 2023 *Global Private Markets Review*, fundraising for growth equity and venture capital (VC) dropped by 17 percent and 11 percent, respectively, year over year. Deal momentum dropped as well, especially in the second half of 2022. Growth activity fell by 18 percent, to \$254 billion. VC deal volume fell even further, by 33 percent, to \$498 billion. The decline in VC deal volume was more dramatic in the second half of 2022, when it fell by 55 percent from the second half of 2021. Meanwhile, PE returns disappointed across strategies. As a result of deteriorating technology valuations, VC and growth equity returns led the decline, in stark contrast with the past several years. The median VC and growth fund fell by 6.3 and 7.3 percent, respectively, through the first three quarters of 2022. The median buyout fund earned 0.9 percent.<sup>2</sup>

Given the change in the macro environment and the metrics that drove valuations in the past, many portfolio companies across industries—especially in the later stages of investment—also expect “down rounds”<sup>3</sup> in the future. Because of reduced fundraising, the compression of multiples, and the overall market slowdown, fewer unicorns were created in 2022 than in the 2021 boom (exhibit).

It's too soon to say how long this slowdown might continue. Public markets already face high levels of volatility: through the first three quarters of 2022, for example, the S&P 500 recorded its third-worst performance since the 1950s.<sup>4</sup> In this period of uncertainty, growth investors have considered shifting from the growth-at-all-costs approach

<sup>1</sup> “Q4 2022 PitchBook-NVCA Venture monitor,” January 11, 2023; 2022 *European Venture Report*, PitchBook, January 18, 2023.

<sup>2</sup> *McKinsey Global Private Markets Review*, 2023.

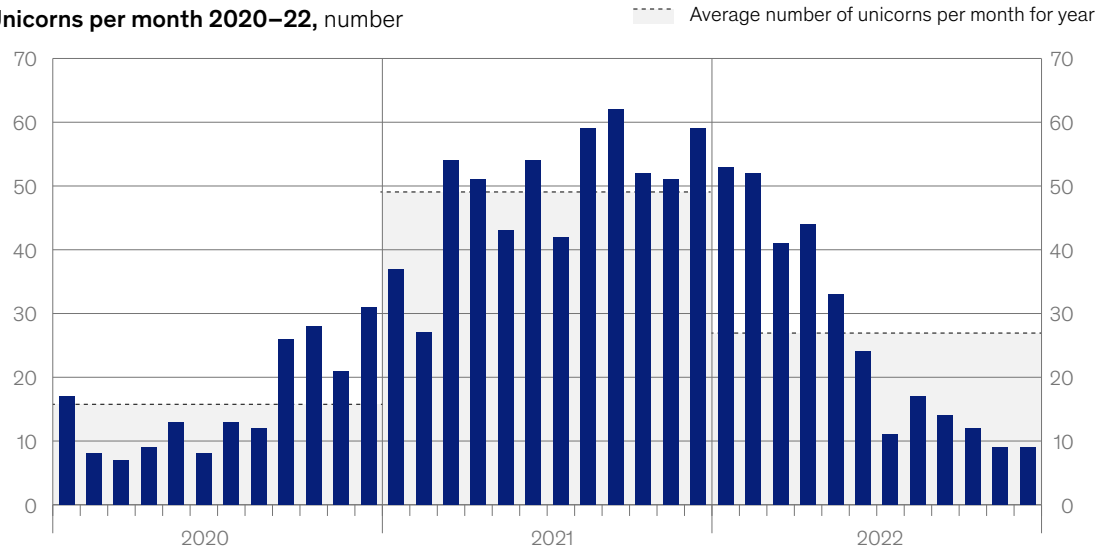
<sup>3</sup> When a company raises equity capital at a lower valuation than it did earlier.

<sup>4</sup> “September, Third Quarter 2022 Review and Outlook,” Nasdaq, October 3, 2022.

Exhibit

## Shrinking valuations and pullback from investors slowed the rate of unicorn creation in 2022.

Unicorns per month 2020–22, number



Source: PitchBook Unicorn Companies Tracker

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to optimal growth. As investors learn to operate in a world of higher interest rates and reduced access to capital, it is less realistic for them to expect hypergrowth across their entire portfolios. But if they shift focus to reducing risks and increasing the resilience of their investments, they can pursue a path of optimal portfolio growth.

Investors typically execute this kind of strategy by finding faster routes to profitability, regularly reviewing the cost base, and developing healthier balance sheets to reduce risk and increase cash runways and the time between funding rounds. An optimal-growth model has worked well in previous downturns. In fact, some of today's largest and most successful companies were born during the dot-com bubble, in the late 1990s, and survived the subsequent crash because of a well-positioned long-term growth strategy.

### Playbook for long-term value creation

Growth equity investors can take three steps to create an optimal-growth model for their portfolio companies:

- basing the priorities for their resources and time on each individual portfolio company's position and the fund's available resources
- determining the levers best suited to optimizing growth
- assigning appropriate resources to execute the strategy and provide support

### Prioritization

Fund managers tend to have limited resources for creating value, so it is essential to continuously determine which portfolio companies have priority. One option is to split the portfolio into different categories, depending on the downturn's effect on each company. We believe that individual portfolio companies lie on a spectrum, with four distinct groups shaped by two key factors: first, their exposure to market conditions and to the macro environment and, second, their financial resilience—for example, how much rising interest rates or lower consumer spending affect a company.

1. **Survivors** have been severely affected by the current environment. They face an existential threat to their overall business and consequently have a greater need to focus on reversing the top-line impact.
2. **Defenders** have sustained a major impact from the current environment. Long-term trends portend probable midterm struggles and growth challenges.
3. **Bloomers** have sustained a short-term impact but are aligned with long-term trends and are likely to recover in the next one or two years.
4. **Capitalizers** have experienced a moderate-to-positive short-term impact from the current environment and are likely to benefit from long-term trends in the future.

### Levers

After identifying priority companies, investors can take several approaches to get on a path of optimal growth. Some funds are by design more passive and less focused on building capabilities. Nonetheless, to unlock returns, it's critical for many operating teams to act as coaches for portfolio companies. Few high-growth companies employ executives who have lived through the type of economic slowdown occurring now. Industry experts who have experienced past crises can help today's entrepreneurs understand how to approach this period of uncertainty.

A two-pronged strategy can help portfolio companies achieve optimal growth. The first is to stretch the runway:

- **Accelerate revenues.** Building up cash balances quickly is crucial in uncertain times. For investors, accelerating the moment of first revenue and increasing annual recurring revenues more quickly is key. Portfolio companies can achieve this goal by, for example, releasing products earlier and conducting presales activities.
- **Optimize costs.** Investors can help companies adjust their cost base and workforce. They could, for example, help their companies use design-to-value product development

approaches, evaluate possible procurement savings, and facilitate organizational-design and restructuring programs. Investors can also consider helping these companies to implement cash management targets—typically not their area of focus.

The second strategy is growth-oriented cost optimization:

- **Optimize pricing.** In times of high inflation, to achieve long-term success, it's important to optimize pricing. Pricing analysis should take into consideration the customers' lower buying power given the higher cost of goods and services. An optimized pricing strategy could, for example, involve a move to value-based pricing (particularly for B2B sales organizations) and increased customer segmentation to develop pricing tiers and new product models, such as video-on-demand (VOD) streaming to introduce ad-based services.
- **Focus on customer value management.** In today's uncertain times, companies should focus on maximizing customer lifetime value through improving the value perceptions of end customers. This approach will help retain and engage them, despite the prevailing pricing and margin challenges.
- **Improve the approach to sales.** For many industries, the sales cycle will be tougher than it has been the past few years. It's critical to ensure that sales teams use a needs-based segmentation and receive training to navigate more challenging sales discussions. Investors can, for example, work more closely with the account managers of their portfolio companies and have value-oriented discussions with them proactively rather than reactively.
- **Find growth opportunities.** Although economic slowdowns pose drawbacks and risks for most companies, they also offer growth opportunities, given changing customer preferences and an evolving competitive ecosystem. Investors can help their portfolio companies to understand growth topics and expansion opportunities aligned with long-term trends and to identify



potential new markets, product adjacencies, and even M&A targets.

The choice of levers depends on the trajectory of the portfolio companies. *Survivors* and *defenders*, for example, can focus on sustained cash management and strategic pivots to align their business models and offerings with long-term trends. Investors ought to consider the appropriate returns on resource investments for such companies. *Bloomers* can focus on continuing to invest in their businesses for the long term to help them come out on top when economic growth resumes.

Once the appropriate levers have been identified, fund managers can adapt their operating models by engaging more with the portfolio companies and helping them with their strategic initiatives. By increasing the frequency and depth of discussions, investors can, for example, ensure that target initiatives get the most appropriate kind of support.

Focus remains a key unlock for value creation in high-growth-portfolio companies, hence initiatives with marginal or particularly long payoffs should be deprioritized in favor of doubling down on the core.

### **Investing in people**

An optimal-growth strategy relies heavily on skills and competencies at the level of both the fund and the individual portfolio companies. Talent is a defining factor in the success of these companies across cycles. In a challenging market environment, building necessary skills and providing the right tools are even more make-or-break than usual. Investors seeking optimal growth shouldn't hesitate to invest in developing human capital for their portfolio companies.

Historical study indicates that portfolio-value-creation teams help raise overall investment returns for funds. According to a McKinsey analysis, for

example, PE firms with such teams outperformed their peers in the 2008 financial crisis. Of the 120 largest PE firms whose 2004–18 investment returns we analyzed, those with value creation teams or portfolio-operating groups achieved an internal rate of return (IRR) about five percentage points higher than the rest.

Resources can sometimes be scarce at the fund level, especially if the vehicle's capital is invested in many companies. The solution is to have flexible resources so fund managers can give portfolio companies end-to-end on-the-ground support and bet on potential growth levers. Those managers should think carefully about the deployment of their operating partners' resources to ensure that they are effectively allocated to portfolio companies that need support and have a high probability of providing strong returns on exit. As funds move into more active roles, they may need a different operating model, with more specialized talent and a stronger focus on partnerships than we have seen in the past few years.

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This is a period of historic uncertainty, and unprecedented times often call for radical measures. Growth investors have long served as advocates for portfolio companies. Now these investors need to become coaches—scrutinizing the portfolio, categorizing companies by how they are likely to fare in the new environment, determining the best courses of action, and allocating resources to goals.

For many growth equity investors, this level of active engagement represents a fundamental shift from the way they have traditionally operated. If the downturn intensifies, they have only limited time to change their approach and take the steps required to unlock returns. The time to act is now.

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The authors wish to thank Tomas Dillon, Deeya D'Souza, Miles Emami, Claudy Jules, Gijs Leenders, Lauren Petroski, Zakaria Shafi, and Illya Symonenko for their contributions to this article.

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# Private equity turns to resiliency strategies for software investments

As CIOs report shifts in software spending, investors may want to refocus their efforts on growing opportunities in cybersecurity, data and analytics, and automation.

*This article is a collaborative effort by Nick Fleisher, Vish Narayanan, Alfonso Pulido, Gabrielle Ramaiah, Sidhanth Rao, and Paul Roche, representing views from McKinsey's Private Equity & Principal Investors and Technology, Media & Telecommunications Practices.*



**Private equity (PE)** investments in software—500-plus deals of more than \$100 billion in value last year—have outperformed other investments made by the asset class for upward of a decade.<sup>1</sup>

But that was until mid-2021. Thereafter, inflation and rising interest rates were among the reasons why software companies lost some 25 percent of their enterprise value over 18 months. Some software segments, such as fintech, “adtech,” and e-commerce, were affected more than others.<sup>2</sup> Current economic conditions will continue to affect software investments in 2023 as IT spending slows down after years of acceleration.<sup>3</sup> In a recent McKinsey survey<sup>4</sup> of 50 CIOs of companies responsible for more than \$10 billion of IT spending, 60 percent of the respondents said they would plan to decrease software-related expenses during a downturn. Seventy-five percent said that they expect to maintain or reduce their spending on new vendors and products.

The near-term spending slowdown will probably have a wide-ranging and mixed impact across software categories—even as many software

segments continue to benefit from long-term tailwinds, such as digitization and strong margins. Long-time investors in software are likely to remember its resilience during previous recessions<sup>5</sup> and may look to boost their portfolios by finding new value creation opportunities that better reflect current conditions.

In this article, we identify the key spending categories and themes from our CIO survey and show how PE investors can take advantage of the opportunities in the software sector.

### **CIOs shift spending to protect near-term ROI**

Our CIO survey suggests that in 2023, spending will remain robust in software domains such as cybersecurity (preventing cyberattacks has a significant ROI), data and analytics (which can help organizations identify additional or more efficient sources of value creation), and automation (some CIOs are being pushed to use technology to help organizations find opportunities to save costs). The surveyed CIOs report that cyclical end

## **Current economic conditions will continue to affect software investments in 2023 as IT spending slows down after years of acceleration.**

<sup>1</sup> PE investments in software generated 25 percent higher internal rates of return than those of other PE sectors from 2008 to 2021; PitchBook, accessed March 2023.

<sup>2</sup> McKinsey analyses on the enterprise value of the top 150 software companies from S&P Capital IQ's database.

<sup>3</sup> Gartner recently cut its 5 percent increase in 2023 IT spending to 2.4 percent. See “Gartner forecasts worldwide IT spending to grow 2.4% in 2023,” Gartner, January 18, 2023.

<sup>4</sup> The online survey was in the field from November 7 to November 11, 2022, and garnered responses from 50 C-suite participants: CIOs or vice presidents of information technology or digital information. The participants work for North American companies with revenues ranging from \$100 million to more than \$5 billion. Their industries include retailing, manufacturing, healthcare, finance, and technology.

<sup>5</sup> During the 2007–08 global financial crisis, software companies outperformed the S&P 500 index by more than 150 percent in revenue and EBITDA growth. In the dot-com crash of the early 2000s, the sector's revenue and gross profits continued to grow at the same rates.

markets sensitive to the business cycle or the larger economy, such as retail, the supply chain, and adtech, will probably suffer the greatest impact from recessionary trends (exhibit).

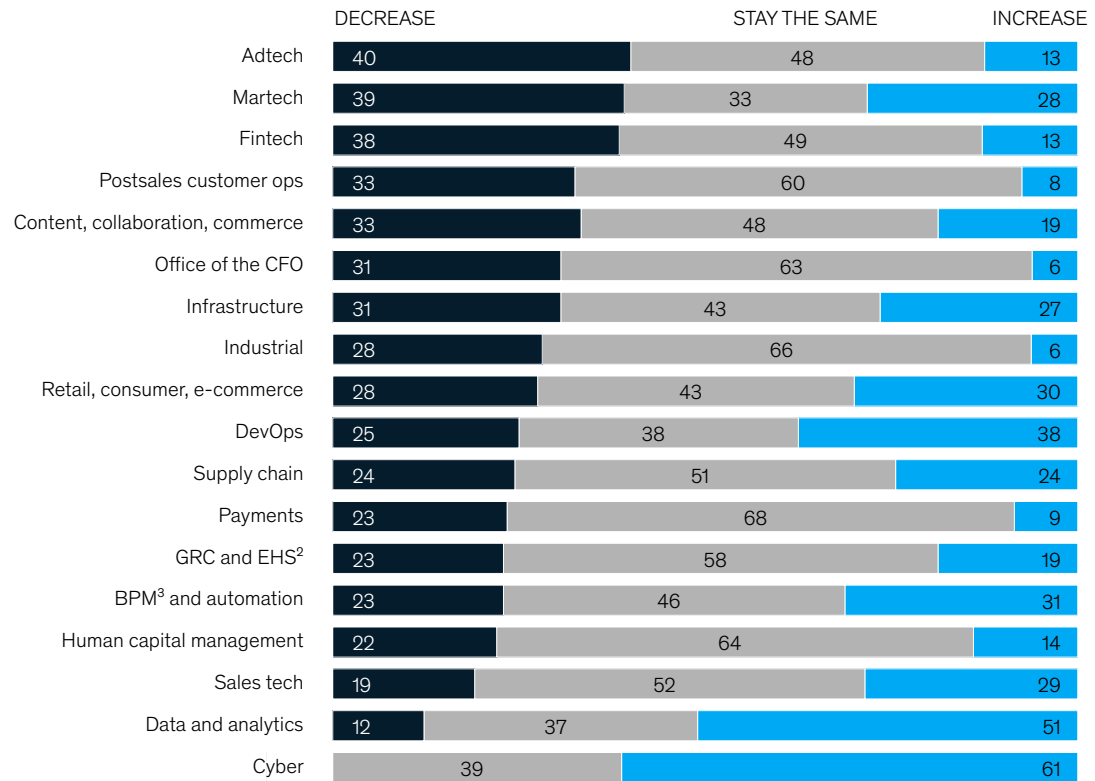
**Optimizing core systems.** The CIOs we surveyed said that the change in software spending will largely reflect the use cases of products. They emphasized the need to maintain mission-critical

operational spending in areas such as finance, HR, and enterprise resource planning for customer services. Survey respondents already investing in these platforms also indicate that they want to optimize such expenditures and are exploring ways to minimize add-on services and consolidate spending (for instance, by rationalizing instances across geographies or business units).

Exhibit

## Most chief information officers plan to increase spend in cyber and data and analytics functions.

Planned change in spend on each domain in a downturn,<sup>1</sup> % of respondents (n = 50)



Note: Figures may not sum to 100%, because of rounding.

<sup>1</sup>Question: How do you plan to change spend on each domain in a downturn?

<sup>2</sup>Governance, risk, and compliance and environmental, health, and safety.

<sup>3</sup>Business process management.

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*Increased focus on efficiency for revenue enabling expenditures.* Businesses continue to reassess their strategies and business plans in anticipation of a continued economic downturn. Software spending directly associated with revenue streams (such as marketing and advertising technology) will be heavily scrutinized to establish greater efficiency in the go-to-market approach.

## Near-term private equity software investment strategies

Against the current backdrop, private equity investors and software portfolio companies have several opportunities this year:

1. **Consolidate platforms.** PE investors and portfolio managers can explore M&A opportunities that better reflect current spending trends among CIOs. Exploring a potential consolidation play in revenue-enabling tools, for example, could accelerate growth in a world where businesses are seeking fewer, more efficient vendors. On the flip side, investing in software-adjacent domains, such as IT services, can help sustain near-term momentum in growth.
2. **Tell—and prove—the ROI story.** Decades of continued growth in spending on software have helped illustrate its intrinsic ROI as an overall investment category. Yet telling a sharp near-term ROI story will be critical for future investment. To generate such a story, investors may consider changing their portfolios in ways

that can demonstrate results more quickly or provide greater resiliency—for example, investing in categories with faster implementation cycles or in very modular software that can create customer-specific efficiencies.

3. **Reestablish the path to efficient growth.** Ongoing spending conservatism by CIOs will probably affect the profitability of software companies if it isn't managed proactively. "Slash and burn" approaches to cost management might provide immediate—but unsustainable—results. Instead, investors and portfolio managers may want their software companies to focus on designing more efficient process management systems across structural categories such as go-to-market expenses and R&D. The aim should be to sustain near-term share while building a longer-term path to optimizing value.

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The current economic downturn is likely to create headwinds for certain software segments, such as adtech, the supply chain, industrial, retail, consumer, and e-commerce. By contrast, growth tailwinds power areas such as cybersecurity; business process management; automotive; governance, risk, and compliance; and environment, health, and safety. To thrive during this period of uncertainty, investors should leverage the current climate to double down on resilient segments and identify market leaders in challenged ones.

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# Outlook: The future of real estate in charts

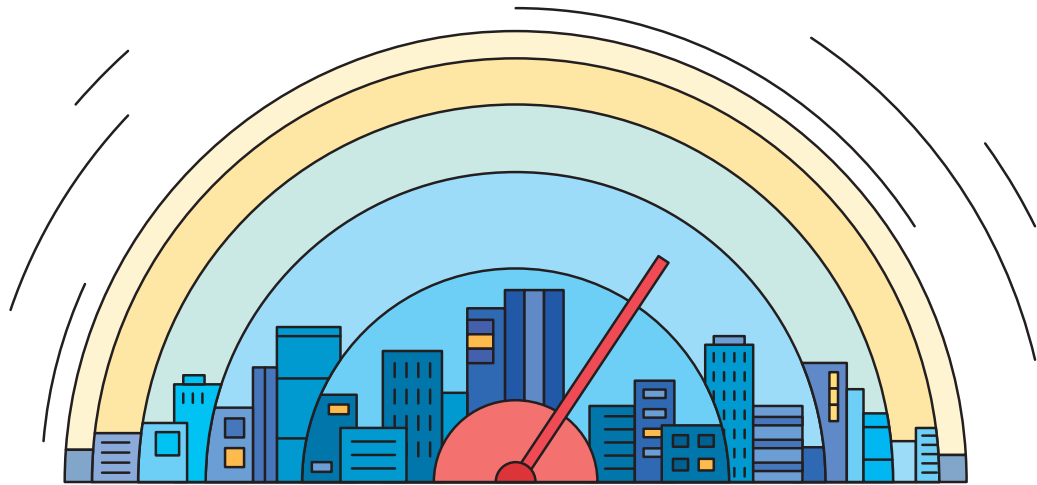
Five deep dives into where the market is headed.

*First published in the  
McKinsey Quarterly's  
fourth-quarter 2023 edition*



# Real estate in major cities is experiencing pandemic aftershocks

Hybrid work and out-migration mean fewer people in urban offices and stores.



**a**n office, home, or shop in a “superstar city”—roughly speaking, a city with a disproportionate share of the world’s urban GDP and GDP growth—has for decades been an unqualified status symbol. Then the COVID-19 pandemic began, prompting a sudden global experiment in working from home. Untethered from offices in urban cores, and therefore less concerned about long commutes, many households opted to relocate to the suburbs. Because they were no longer working in the office or living near it, they stopped shopping as much in urban cores.

Out-migration has since declined, but it has neither ended nor reversed, and remains higher than it was before the pandemic began—and office employees continue to engage in hybrid work.

What could be the long-term impact of these changes on real estate in the world’s superstar cities? The McKinsey Global Institute (MGI) modeled future demand for office, residential, and retail space. Across scenarios, demand for office and retail space will be generally lower in 2030 than it was in 2019. Our analysis also shows that the ripple effects

will be complex—for example, that certain kinds of cities and neighborhoods will be more heavily affected than others.

We considered a wide variety of factors, including long-term population trends; employment trends, such as the ongoing effects of automation; office attendance patterns by industry; employee coordination, defined as the maximum share of workers in an office at a given time; workers’ ages and incomes; the share of a city’s population that commutes from elsewhere; housing price variation among neighborhoods; and shopping trends, such as the ongoing increase in online shopping. In addition to many secondary sources, our modeling includes information from a large global survey that we conducted to understand the behavioral shifts caused by the pandemic.

→ *This outlook, first published in the McKinsey Quarterly’s fourth-quarter 2023 edition, is derived from “Empty spaces and hybrid places: The pandemic’s lasting impact on real estate,” on McKinsey.com.*

## The pandemic reduced population growth in many superstar cities.

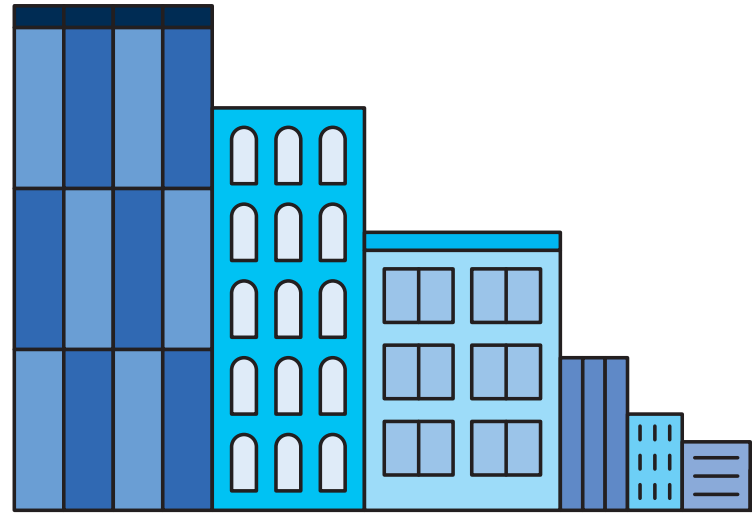
Population growth per year, selected metro areas, %



Note: For sources and details, see exhibit 9 in the full report, *Empty spaces and hybrid places: The pandemic's lasting impact on real estate*, McKinsey, July 2023.

# The four traits of cities that lost the most population

More people left places with expensive homes, high office density, many knowledge workers, and few retailers.

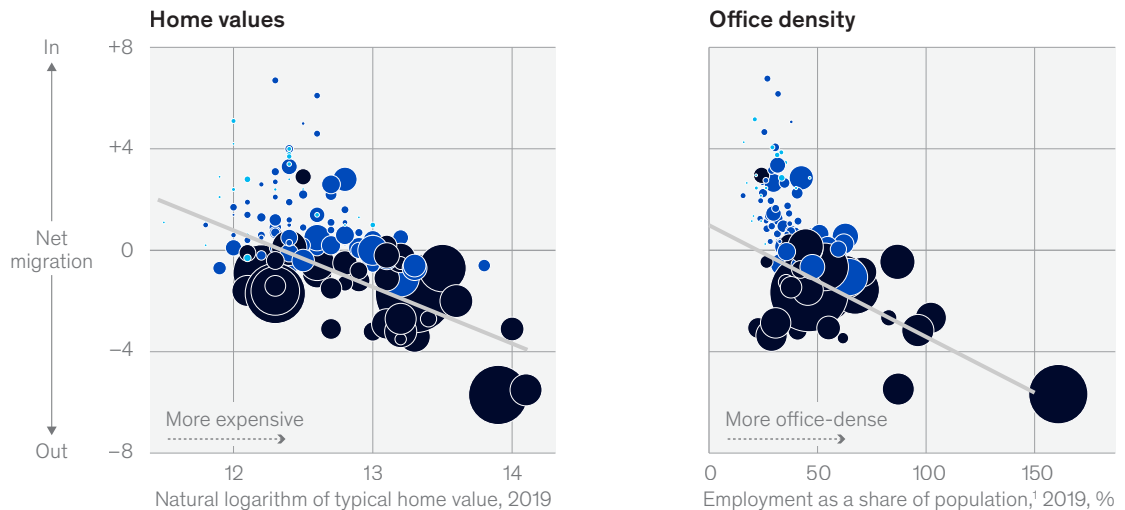


→ This outlook, first published in the McKinsey Quarterly's fourth-quarter 2023 edition, is derived from "Empty spaces and hybrid places: The pandemic's lasting impact on real estate," on McKinsey.com.

**h**ybrid work is the key factor contributing to weakening demand for real estate in urban cores (which, in our analysis, refers to the densest counties in a metropolitan area). Our research also reveals that hybrid work and out-migration are closely linked, and that out-migration is more prevalent in places where hybrid work is more common. In our survey, among respondents who moved after March 2020, 20 percent said that their move was possible only because they could now work from home more frequently.

## Expensive, office-dense counties with many knowledge workers and weak retail had greater pandemic out-migration.

Net migration in major US metropolitan counties, 2020–21, as a share of population, %



<sup>1</sup>This measure is a proxy for the share of real estate occupied by office buildings. Higher employment as a share of population suggests a large population of commuters working in office-dense areas.

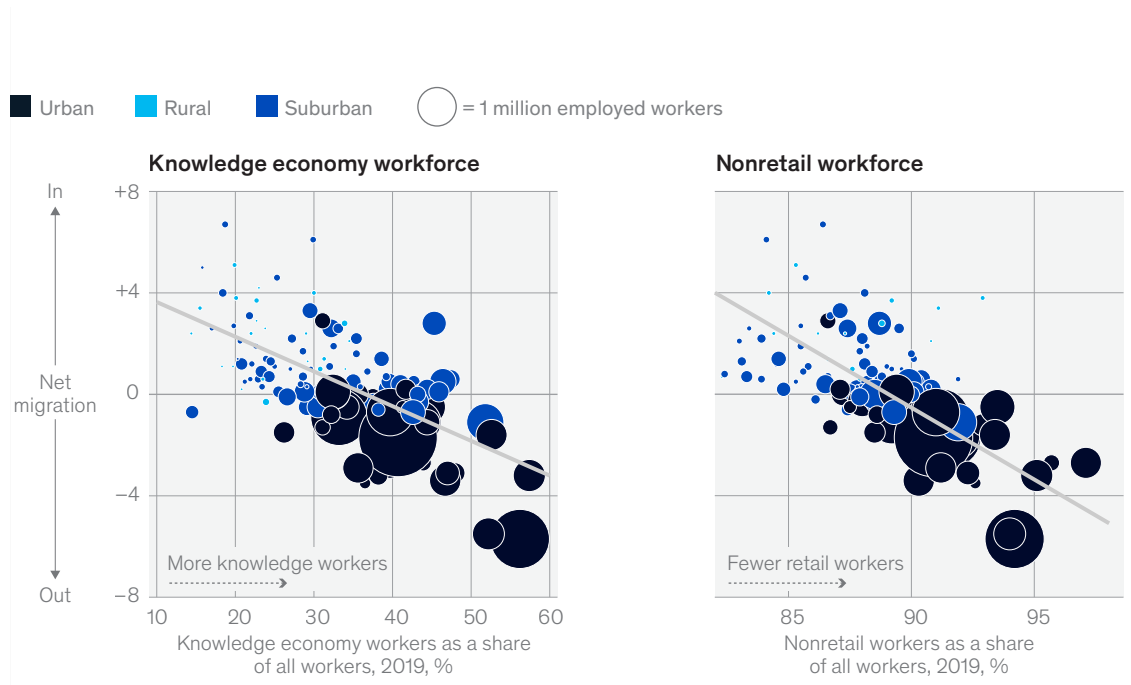


New York's urban core lost 5 percent of its population from mid-2020 to mid-2022, San Francisco's lost 7 percent during the same period, and London's lost 7 percent from mid-2020 to mid-2021. The main reason was out-migration. In the suburbs, by contrast, populations grew, or they shrank less dramatically than populations in the urban cores did.

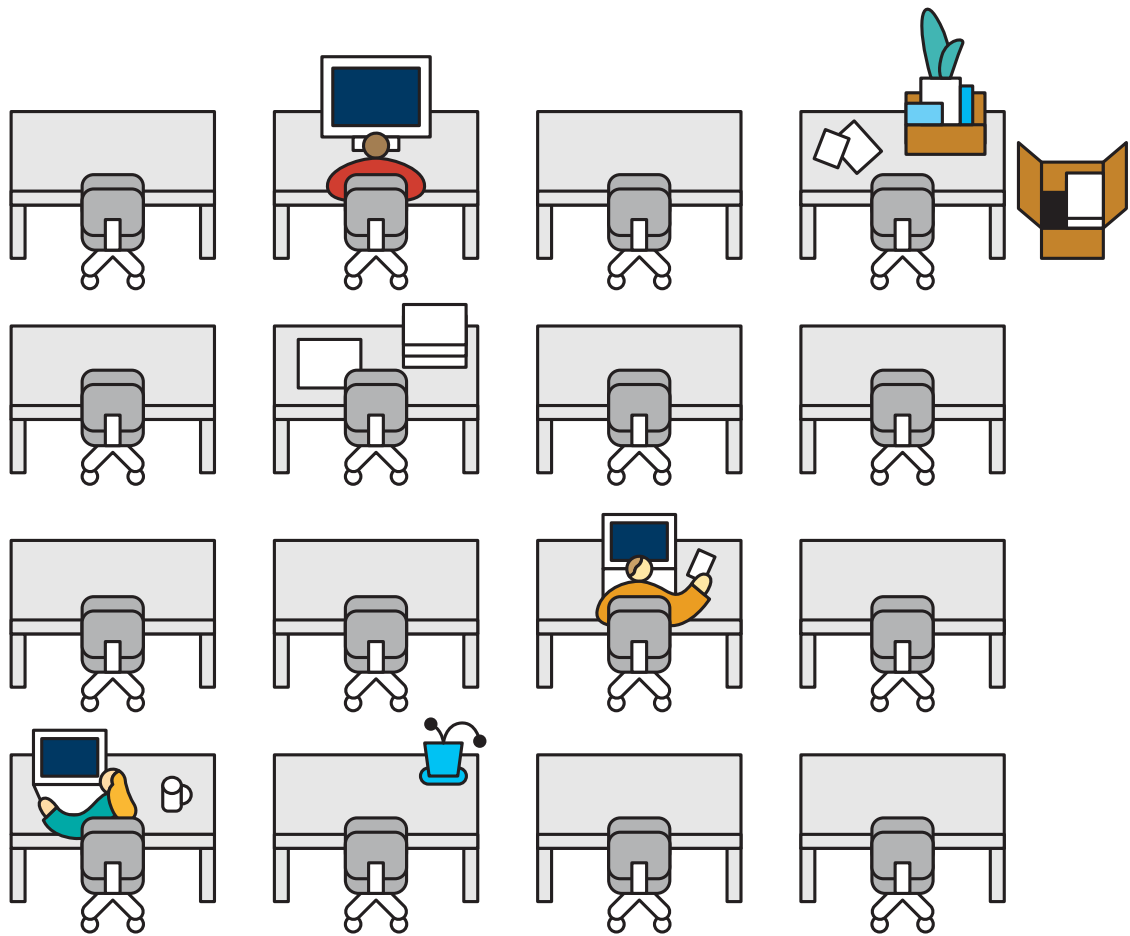
and Japanese ones. The suburbanization effect may have been stronger in US superstar cities than in European and Japanese ones because US urban cores tend to be office-dense and retail-poor, whereas in European and Japanese urban cores, office, residential, and retail spaces tend to exist alongside one another.

The urban cores where population declined the most tended to be those with expensive homes, high office density, a high share of workers in the knowledge economy, and limited retail presence. In general, US urban cores were more affected than European

Out-migration from urban cores of superstar cities seems to have slowed, but it is still above prepandemic levels. In other words, the people who moved out during the pandemic are not moving back, and others keep leaving.



Note: For sources and details, see exhibit 11, *Empty spaces and hybrid places*, McKinsey, July 2023.



## A softer market for offices in centers of commerce

Pandemic effects will lower demand, but by how much?

**T**here are two stories to tell about demand for office space: what has already happened, and what is likely to occur. Demand for office space has declined, and vacancy rates have increased in all the cities we studied. In the future scenarios we modeled, the amount of office space demanded in most cities will not return to prepandemic levels for decades.

By 2030, demand will be as much as 20 percent lower than it was in 2019, depending on the city. That estimate is what our model yields in a moderate scenario—one in which, by 2025, office attendance will be higher than it is now but still lower than it was before the pandemic. In a more severe scenario, in which attendance for all office workers in 2030 falls to the rate already seen in large firms in the knowledge



economy, demand will be as much as 38 percent lower than it was in 2019—again, depending on the city.

Falling demand will drive down value. In the nine cities we focused on, a total of \$800 billion (in real terms) in value will be at stake by 2030 in the moderate scenario. On average, the total value of office space will decline by 26 percent from 2019 to 2030 in the moderate scenario and by 42 percent in the severe one. The impact on value could be even stronger if rising interest rates (and, consequently, expanding cap rates) compound it.

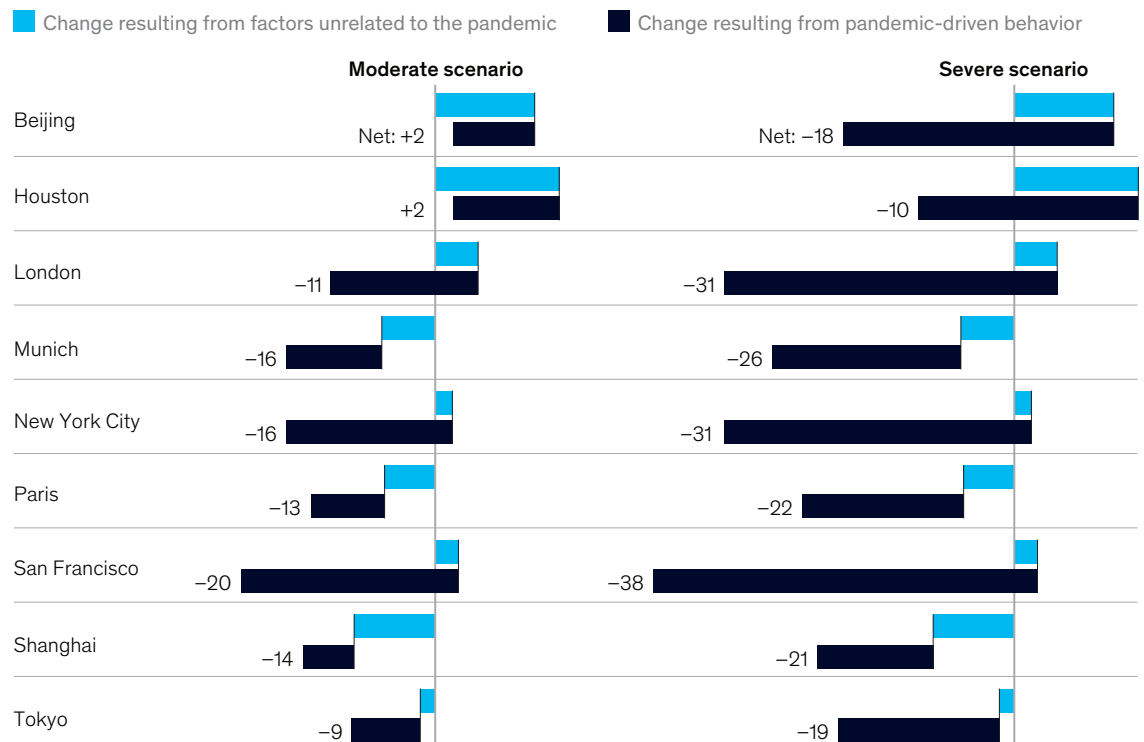
The resulting surplus of office space will be most pronounced in the lower-quality and older buildings that the real estate industry calls Class B and Class C. From 2020 to 2022, rents, demand, and

sometimes prices generally grew more quickly (or fell less sharply) for Class A buildings than for Class B buildings in US superstar cities. There are a number of reasons for this “flight to quality.” One is that many employers see high-quality space as a way to encourage office attendance among their employees. Also, now that hybrid work has reduced the total amount of space that employers need, they can spend their budgets on smaller amounts of higher-quality space rather than larger amounts of lower-quality space.

→ This outlook, first published in the McKinsey Quarterly’s fourth-quarter 2023 edition, is derived from “Empty spaces and hybrid places: The pandemic’s lasting impact on real estate,” on McKinsey.com.

## In most superstar cities, demand for office space will be lower in 2030 than it was in 2019.

Projected change in office space demand before prices adjust, 2019–30, %



Note: For sources and details, see exhibit 21, *Empty spaces and hybrid places*, McKinsey, July 2023.

# Most cities will see shrinking demand for retail space

Online shopping and unoccupied offices have led to emptier stores.



**a**s people stayed home during the pandemic, they radically shifted the way they shopped. Foot traffic plummeted near stores in the cities we studied, and online spending as a share of retail spending spiked. More recently, foot traffic near stores in metropolitan areas has risen again, but it is still 10 to 20 percent lower than it was before the pandemic. A major reason for the decline is that online spending as a share of retail spending, which admittedly grew more slowly after the initial spike, nevertheless remains higher than it was in 2019.

Hybrid work is to blame, too. Retailers in urban cores face particularly acute challenges in attracting customers. As of October 2022, foot traffic had recovered noticeably less near those stores than near suburban ones. Office-dense neighborhoods in urban cores are facing even

more challenges. The reason is that when people come to the office less often, they shop less often near the office. In our survey, respondents in the United States who worked at the office no more than one day per week reported doing much less of their total retail spending near the office than did those who worked in the office two to five days a week.

Because of reduced foot traffic near urban stores during the pandemic, vacancy in retail space has increased in all the superstar urban cores we studied, and rents have declined, particularly in office-dense locations. From 2019 to 2022, asking retail rents declined an average of 5.4 percent (in real terms) in the cities we studied.

The demand for retail space in superstar urban cores that we modeled will be lower in 2030 than it was in 2019. The model indicates that there will be

9 percent less demand for retail space in the median city we studied. Some cities may be more dramatically affected: in San Francisco's urban core, for example, demand could be 17 percent lower. That estimate is what our model yields in a moderate scenario, which assumes that there will be a partial return to the office, a reversion by 2025 to the prepandemic online shopping growth rate, and people who moved during the pandemic will not move back. In a more severe scenario, the decline in demand in San Francisco's urban core could be as high as 26 percent.

Differences in projected demand among cities can be attributed to the relative contribution of the growth drivers that our model used, including population growth, per capita retail spending, and online spending as a share of all retail spending. For example, in London's urban core, population outflows from

2019 to 2022 were among the largest that we studied, meaning that population growth is not projected to boost demand much. What does have a major effect on demand is online spending as a share of all retail spending, which is higher in the United Kingdom than in any other country we studied except China.

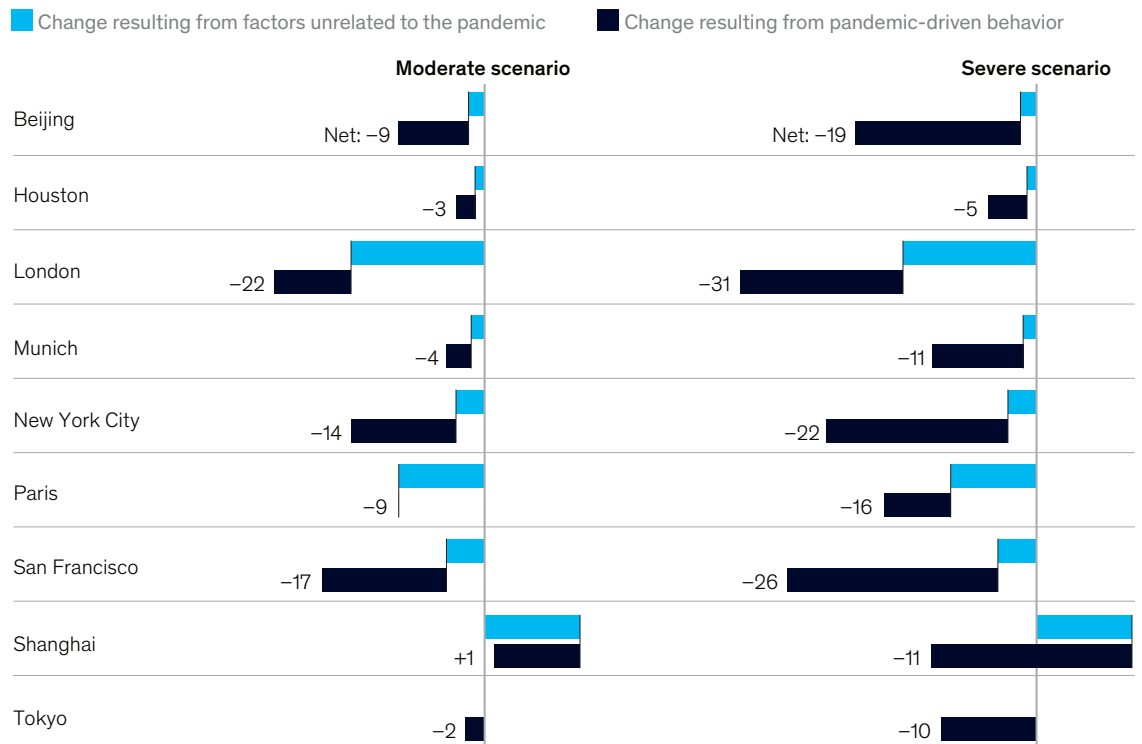
It should be noted that these scenarios do not account for price elasticity or the effect of higher vacancies leading to reduced retail rents, which in turn could entice new tenants to take up cheaper space—all of which could stabilize demand.



*This outlook, first published in the McKinsey Quarterly's fourth-quarter 2023 edition, is derived from "Empty spaces and hybrid places: The pandemic's lasting impact on real estate," on McKinsey.com.*

## In nearly all superstar urban cores, demand for retail space will be lower in 2030 than it was in 2019.

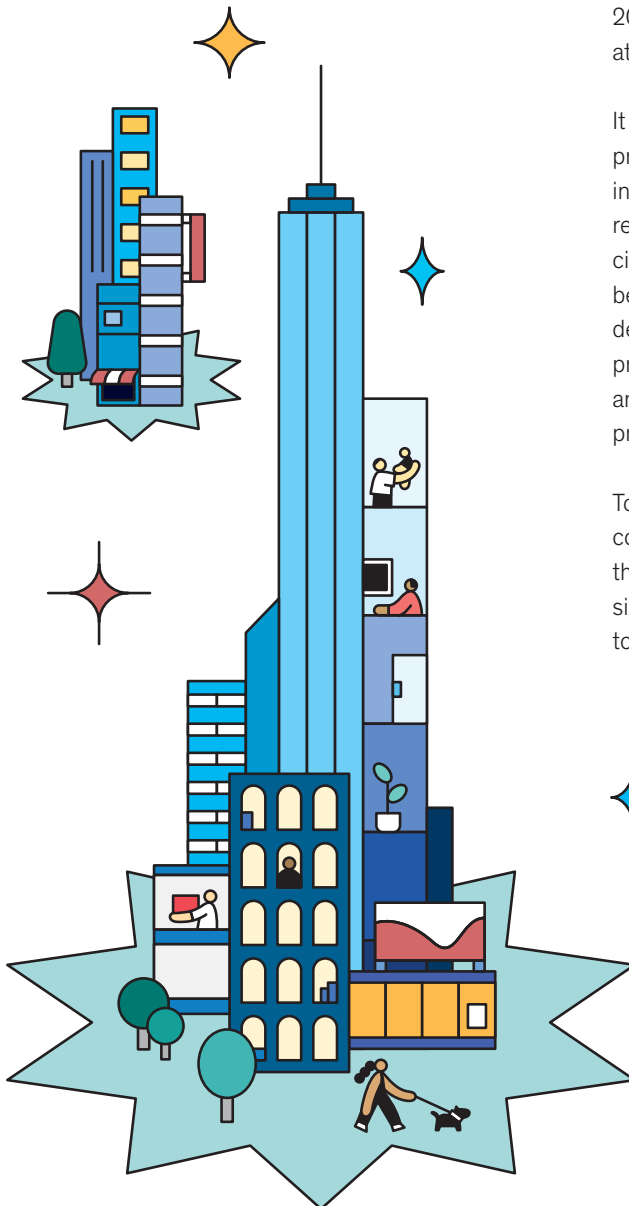
Projected change in retail space demand before prices adjust, 2019–30, %



Note: For sources and details, see exhibit 32, *Empty spaces and hybrid places*, McKinsey, July 2023.

# People still want to live in superstar cities

Demand is expected to return—although below the suburban or prepandemic pace.



**I**n most superstar urban cores, even though demand for residential real estate has been weak as people have migrated out, it will still be greater in 2030 than it was in 2019, according to our moderate-scenario model. Houston, Munich, and Tokyo will experience the strongest projected demand growth.

Although demand is projected to grow in most urban cores, it is projected to grow less than in the suburbs of those same cities and less than it would have if the pandemic had never occurred. As a result, excess supply in our model is far greater in the cores than in the suburbs. We define excess supply as the percentage of space that is vacant beyond the average from 2014 to 2019—in essence, the part of projected vacancy that is attributable to the pandemic in our model.

It should be noted that our model does not consider price elasticity. That is, the projections are for a situation in which prices have not yet adjusted. But ample research suggests that price elasticity in superstar cities is high, so any available floor space will probably be taken up quickly. In other words, should falling demand push down prices and rents, then those lower prices and rents would quickly attract new residents and encourage existing ones to buy or rent more space, preventing vacancy from growing.

To better understand how our model estimates demand, consider the moderate scenario for London. In both the urban core and the suburbs, the population and the size of the average home are expected to grow, adding to total demand. Furthermore, the number of people



in an average household is expected to decline, also adding to total demand. But the effects of migration differ: migration out of the urban core is projected to drive down demand there, whereas migration into the suburbs is projected to drive up demand there.

In a moderate scenario, out-migration will ebb quickly or stop. In a severe scenario, out-migration will continue, though at a lower rate than during the pandemic. But even in the severe scenario, net demand will increase in most cities. Both scenarios rest on the assumption that out-migration will continue to be higher than it was from 2015 to 2019 and that the wave of residents who left cities in the past three years will not return.

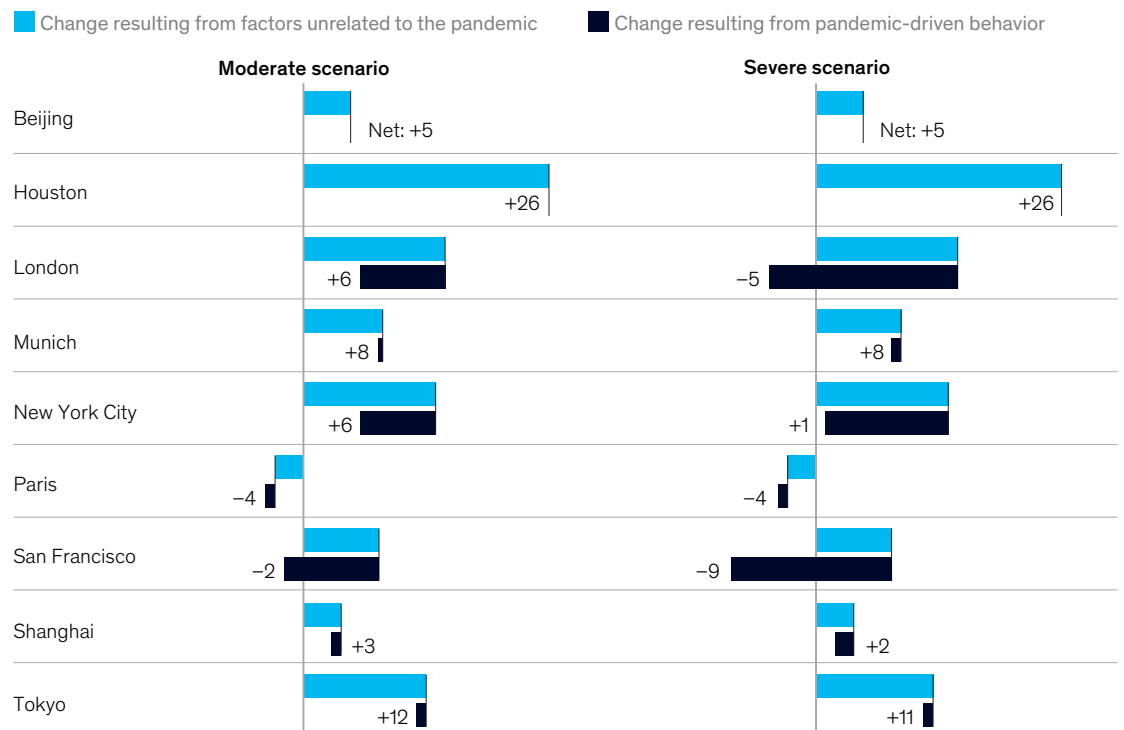
Unfortunately, in part due to the price elasticity issue discussed above, the downward pressure on

prices and rents is unlikely to make superstar cities—many of which have expensive housing, as well as homelessness—much more affordable for residents. From December 2019 to December 2022, home prices in the United States rose by 40 percent, more than twice as fast as inflation. In US superstar cities' urban cores, prices grew more slowly, by 25 percent—but still faster than inflation. Housing there will probably become less expensive than it would have been without the pandemic, but homes will remain out of reach for many.

→ This outlook, first published in the McKinsey Quarterly's fourth-quarter 2023 edition, is derived from "Empty spaces and hybrid places: The pandemic's lasting impact on real estate," on McKinsey.com.

## In both moderate and severe scenarios, net demand for residential space will increase by 2030 in most superstar cities.

Projected change in residential space demand before prices adjust, 2019–30, %



Note: For sources and details, see exhibits 27 and 29, *Empty spaces and hybrid places*, McKinsey, July 2023.

# In the near term, commercial real estate may not hedge inflation

Rising cap rates could erode CRE's power to outperform amid inflation. Real estate players can still take steps to thrive.

*by Ryan Luby, Shaw Lupton, Rob Palter, and Brian Vickery*





**Commercial real estate (CRE)** has long enjoyed a reputation for being a good hedge against inflation, yet even industry veterans might be hard-pressed to explain exactly why. Has it delivered better real (inflation-adjusted) returns during inflationary periods than at other times? Has it outperformed other asset classes during inflationary periods? With inflation at 40-year highs, we decided to perform a data analysis of CRE's inflation-hedging attributes. Our goal: a definitive answer to whether CRE deserves its golden reputation and a sense of how it might perform this time around.

The answer to the first question is yes: CRE has helped investors retain real value during periods of heightened inflation. According to McKinsey's analysis, CRE outperformed inflation, its own historical average, and other asset classes (including stocks, bonds, and gold) during most of the last seven periods of elevated inflation. However, there's a wrinkle in the data that contradicts accepted wisdom: CRE performed this way despite rents generally *not* keeping up with inflation.

The principal reason CRE has served well as an inflation hedge<sup>1</sup> is that in periods of higher inflation, capitalization rates—effectively, the net operating income (NOI) yield investors are willing to accept—have tended to compress. While interest rates typically rise in periods of inflation, cap rate spreads often narrow. This counterintuitive finding is perhaps partly the result of widespread belief in real estate's inflation-hedging properties: investors put money into asset classes they believe will protect real value.

Understanding how cap rates have contributed to CRE's inflation-hedging identity is particularly pertinent to modeling potential outcomes for the asset class today. That's because currently, amid the fastest monetary tightening on record, cap rate trajectories may differ substantially from those of past inflationary periods. As the macroeconomic panorama evolves, owners contemplating

operating, refinancing, or selling existing assets, as well as investors considering new opportunities, can benefit from understanding the following dynamics:

- Historically, CRE has outperformed during inflationary periods since 1980. During each of these periods, although rent growth did not keep up with inflation, cap rate compression contributed to outperformance.
- This time, however, macroeconomic conditions could lead to cap rate expansion, which could erode CRE's inflation-hedging prowess.
- Building owners may be able to maintain and grow real asset value by considering certain value-creating actions.

### **Historically, CRE has outperformed during inflationary periods**

Following losses induced by the COVID-19 pandemic, CRE returns have partially rebounded along with inflation, despite continued softness in the office market. But real risks could be introduced by persistently high inflation and interest rates, the rising cost and declining availability of debt, and possible economic contraction—all of which may lead to cap rate expansion. To prepare, real estate players can start by arming themselves with a fresh understanding of an old piece of industry wisdom.

During the seven inflationary periods from 1980 to 2022,<sup>2</sup> CRE returns, at 11.7 percent annualized, have generally outperformed inflation, their own historical average, and other asset classes, including the S&P 500 and BBB corporate bonds (exhibit). More specifically, CRE outperformed inflation in six of the seven inflationary periods and outperformed its own historical average in five of them. The asset class outperformed stocks in four of the seven periods, and bonds in six of them. Real estate broadly has been a useful hedge against inflation.

<sup>1</sup> In this analysis, an "inflation hedge" is defined as an asset with a rate of return that is higher than the current inflation rate.

<sup>2</sup> Inflationary periods are defined as segments of six or more quarters of consecutive inflation higher than the respective decade average. The seven periods within the range of years studied are Q1 1980–Q3 1982, Q1 1990–Q3 1991, Q1 2000–Q3 2001, Q2 2004–Q3 2006, Q1 2011–Q2 2012, Q4 2016–Q4 2018, and Q2 2021–present.

Exhibit

## During seven inflationary periods, commercial real estate returns generally outperformed inflation, their own historic average, and other asset classes.

**Commercial real estate (CRE) performance vs alternate benchmarks across inflationary periods**

● Outperformance  
● Underperformance

Benchmark	1980–82	1990–91	2000–01	2004–06	2011–12	2016–18	2021–22	Success rate <sup>2</sup>
Inflation	●	●	●	●	●	●	●	6 out of 7
Average CRE 40-year return <sup>1</sup>	●	●	●	●	●	●	●	5 out of 7
S&P 500	●	●	●	●	●	●	●	4 out of 7
BBB corporate bonds	●	●	●	●	●	●	●	6 out of 7
10-year US Treasury bonds	●	●	●	●	●	●	●	6 out of 7
Gold spot price	●	●	●	●	●	●	●	5 out of 7

Note: Data as of Dec 2022.

<sup>1</sup>Average all-sector commercial real estate returns from 1980–2022.

<sup>2</sup>Inflationary periods where commercial real estate generated superior absolute returns compared with a range of financial benchmarks.

Source: Bloomberg; National Council of Real Estate Investment Fiduciaries Property Index; US Federal Reserve

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In every period, at least one CRE sector—multifamily, office, retail, or industrial—beat inflation. And in six of the seven inflationary periods, the period’s top-performing sector outperformed both stocks and bonds. Picking the right sector based on fundamentals, for those with the foresight to do it, has been a great investment relative to other options in the same time periods.

Historically, even investors that didn’t pick the top-performing sector would have managed to generate real inflation-adjusted returns in most periods. The bottom-performing CRE sector in each inflationary period managed to outperform inflation in six of the seven inflationary periods. The bottom-performing sector also outperformed stocks in four out of seven periods and bonds in five out of seven periods.

Secular trends drove sector outperformance (or underperformance) in each inflationary period. The office sector had standout performances as institutional investment poured into the asset class in the 1980s and again with the dot-com boom in the early 2000s.<sup>3</sup> Retail outperformed in the early 2000s as big-box retailers transformed the shopping landscape before brick-and-mortar retail came under pressure from e-commerce in the 2010s.<sup>4</sup> Multifamily generated strong returns in the early 2010s as the millennial generation entered the housing market and a shift away from homeownership fueled rental demand.<sup>5</sup> For its part, industrial has posted strong returns since the 2010s as the growth of e-commerce has required new-age distribution centers.<sup>6</sup>

<sup>3</sup> McKinsey analysis of National Council of Real Estate Investment Fiduciaries (NCREIF) data.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

<sup>6</sup> “McKinsey Global Private Markets Review: Private markets turn down the volume,” McKinsey, March 21, 2023.

### **Cap rate compression is the key enabler of CRE outperformance**

A common perception is that CRE's inflation-hedging power comes largely from owners' ability to raise rents during inflationary periods. One reason for this perception is that CRE leases protect NOI from inflation in several ways. First, both residential and commercial leases typically reset to market level upon expiration. Second, multiyear commercial leases typically require tenants to pay their proportional share of operating expenses and any future increases. Third, on the retail side, many leases tie a portion of rental income to store revenue, allowing rents to grow with inflation in prices of consumer goods.

However, McKinsey's analysis reveals that rent growth alone (supported by the aforementioned lease characteristics) has not historically provided a full hedge against inflation. Although rents do tend to increase more quickly during inflationary periods, those increases rarely match the pace of rising inflation point for point. Annualized CRE rent growth averaged only about 3 percent during the seven inflationary periods studied, compared with average annualized inflation of almost 5 percent. Thus, real rents fell.

If rents typically fall behind inflation, then how can CRE deserve its inflation-hedging notoriety? The key factor is cap rate compression, which averaged roughly 20 basis points annually during the periods studied, contributing significantly to total returns. Although the four primary CRE sectors—office, industrial, retail, and multifamily—and their subcategories serve distinctive purposes in the economy and behave differently in many ways, all sectors have reacted similarly to periods of high inflation: cap rates compressed, and rents rose nominally (but not in real, or inflation-adjusted, terms).

### **Macroeconomic conditions could make this time different**

Performance throughout much of the current inflationary period has fit the historical pattern. Elevated CRE returns have been accompanied by overall rents growing at a rate lower than inflation—higher in multifamily and industrial, lower in retail and office. And until recently, cap rates dipped to all-time lows. However, the macroeconomic environment is diverging from the patterns observed in the last seven inflationary periods in ways that could lead to cap rate expansion. Such a scenario could undermine CRE's ability to hedge inflation this time around, and indeed, in recent quarters, CRE returns have fallen.

One notable difference is that six of the previous inflationary periods analyzed occurred during a roughly 40-year period of gradually declining interest rates.<sup>7</sup> Today, amid monetary tightening that occurred at unprecedented speed,<sup>8</sup> the cost of debt is rising, and its availability is declining. The vacancy rate—particularly in the office market—is another headwind for investors.<sup>9</sup> And an elevated chance of recession may contribute to risk aversion.

It could therefore take some time to arrive at the right economic conditions for a return of cap rate compression—which is, after all, a measure of risk tolerance. With the benefit of falling cap rates in question, building owners will need to work harder to maintain and grow the value of their real asset.

### **Building owners can consider actions to maintain and grow real asset value**

In the recent past, real estate players could be fairly confident that well-located buildings, whether residential or commercial, would provide solid returns. Today, CRE must do more to attract and retain quality tenants amid pandemic-era changes

<sup>7</sup> Jean-Marc Natal, Philip Barrett, "Interest rates likely to return toward pre-pandemic levels when inflation is tamed," IMF, April 10, 2023.

<sup>8</sup> Jenna Ross, "The pace of US interest rate hikes is faster than at any time in recent history: Is this creating a risk of recession?," World Economic Forum, October 12, 2022.

<sup>9</sup> "European commercial real estate: the cracks are starting to show," *Financial Times*, April 9, 2023.

in how people work and live. Persistent high inflation adds even more pressure to manage building operations and leasing optimally and to acquire, refinance, and execute dispositions strategically. In today's macroeconomic environment, it may be wise for owners to consider the following actions.

#### **Focus on leaner operating costs**

Investment models should be sensitized to the possibility of persistent inflation and elevated rates. Asset managers can benefit from reworking NOI optimization models to account for higher operating costs. Likewise, property return models can be updated to incorporate a potentially long-term increase in financing costs.

Directing capital expenditures to areas that reduce operating costs is always important but is particularly so during inflationary periods. Some investments, such as in energy-efficient windows and HVAC controls, also can help achieve emission reduction targets for buildings and tenants.

#### **Improve tenant experience**

In the absence of intervention, real rents fall during inflationary periods. To earn the ability to maintain real rents, smart operators will focus on the features that tenants value most. These might include on-premises meeting spaces in Class A office buildings, which could support tenants' flexible work strategies. In apartment communities, busy

professionals may willingly pay a premium for amenities such as car charging, dry cleaning, and dog walking.

#### **Acquire, develop, and sell properties with inflation in mind**

Inflation should be a factor in decisions related to acquisitions, property development, and dispositions. Owner-operators may benefit from focusing on acquisition and development opportunities in a specific geographic area, so they can build market scale and leverage operating cost efficiencies. Similarly, they could consider selective dispositions of assets in markets that do not support scale.

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The conventional wisdom that CRE is a good hedge against inflation is borne out by historical data. But because this hedge is an outcome of cap rate compression, real estate investors—current and future—are wise to consider actions tailored to today's macroeconomic reality. As costs rise throughout the economy, especially for labor and materials, controlling operating expenses is a key to NOI (even if some cost increases are passed through to tenants) because rent increases tend to lag behind inflation. Knowing how macroeconomic forces have historically affected the sector is important, but there's no substitute for taking preemptive action.

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# Six new imperatives for real estate players

Higher inflation, higher interest rates, and other challenges mean that the real estate industry needs new paths to success

*by Sophia Brañes, Daniele Chiarella, Aditya Sanghvi, and Brian Vickery*





**'If you build it, they will come.'** For decades, that's been as true for well-located office, retail, and residential real estate as for the baseball field in *Field of Dreams*. But today, paradigm shifts, higher inflation, higher interest rates, and climate change are forcing real estate investors and operators to face a fraught reality: today, if you build it—or buy it—in the usual way, they might not come.

It goes without saying that the COVID-19 pandemic upended where and how the world uses spaces. In some regions, office attendance is still dramatically lower than it was before the pandemic; in the United States, for example, it hovers at around 50 percent.<sup>1</sup> Consumers have returned to brick-and-mortar stores<sup>2</sup> but are shopping closer to home.<sup>3</sup> Greater expectations for same- or next-day shipping have increased demand for industrial square footage near the places where people live and work.

Perhaps even more transformative than altered demand is the fact that occupiers have a new set of needs beyond what real estate companies have traditionally provided. Hybrid work and omnichannel sales require that landlords supply creative physical designs, as well as innovative services and solutions. Tenants, lenders, and other stakeholders increasingly look for buildings that play a role in fighting climate change. Digital sophistication has become essential to help real estate players act more quickly and make wiser decisions, to enable emissions reporting, and to track and analyze how space is used.

Complicating the panorama is the fact that after a decade-long growth market, capitalization (cap) rates have expanded across sectors.<sup>4</sup> Interest rate hikes,<sup>5</sup> combined with higher inflation in many parts of the world,<sup>6</sup> have dramatically altered the financing costs and expected returns for owners,

developers, and managers. Coupled with lower labor availability, these higher costs have made development and redevelopment more challenging and less profitable.<sup>7</sup> Further, raising capital is more difficult today than it was just a few years ago,<sup>8</sup> because some limited partners have reduced their annual commitments—in part because their public-equity portfolios have declined sharply in value, so their real estate portfolios, as currently valued, exceed their allocation targets. (This is called the denominator effect.)

Inflation and uncertainty about the direction of the global economy have made housing significantly less affordable, made gaining access to credit even more difficult in emerging markets, and created a challenging fundraising, dealmaking, and return-generating environment for real estate investors and operators. Those who invest in and operate real estate as they did five years ago may underperform and lose share. In this unique moment, real estate players should adopt a new mindset: replace “if you build it, they will come” with “if you operate brilliantly and please tenants, they will stay.” In the current market, the success of a real estate investor or operator hinges upon whether they adopt the following six imperatives:

1. Create solutions for clients, not just physical spaces.
2. Use developments to generate momentum, not merely to capture momentum.
3. Find value creation opportunities throughout a project's life cycle, not just at the end points.
4. Embrace sustainability as an opportunity, not a compliance process.

<sup>1</sup> “Getting America back to work,” Kastle, accessed February 2023.

<sup>2</sup> “Quarterly retail e-commerce sales 3rd quarter 2022,” US Census Bureau, November 18, 2022.

<sup>3</sup> “Commission's new consumer survey shows impact of COVID-19 and popularity of 'greener' choices,” European Commission, March 12, 2021.

<sup>4</sup> “McKinsey's Private Markets Annual Review,” McKinsey, March 24, 2022.

<sup>5</sup> “Central banks ramp up rates again but the pace slows,” Reuters, December 15, 2022.

<sup>6</sup> Paul Hannon and Harriet Torry, “World Bank cuts 2023 global growth projection as inflation persists,” *Wall Street Journal*, January 10, 2023.

<sup>7</sup> Austen Hufford, “Home building fell sharply in July as costs increased,” *Wall Street Journal*, August 16, 2022.

<sup>8</sup> McKinsey analysis of Prequin data.



# Today's competitive pressures mean that real estate owners and operators should rethink their purpose.

5. Embed digital solutions and advanced analytics in everything, not just by sporadically adopting individual solutions.

6. Focus on operating efficiency, not just on income.

Acting on these six imperatives will require investments or partnerships to access technology, analytics, operations, and climate science capabilities. Investors and developers have long been the stars of real estate organizations, but today it's clear that the value created by people with digital talents and capabilities may come to equal that created by "traditional" real estate people.

Real estate executives face new challenges in navigating today's shifting demand patterns, the changing needs of occupiers, and a difficult macroeconomic climate—while transforming organizations both sustainably and digitally. In this article, we examine the actions that have become crucial for investors and operators seeking a competitive edge.

## Create solutions for clients

With some companies cutting back on the office space they own or rent, competition to attract tenants is stark. Over the past three years, a net 125 million square feet of office space became available in the United States and United Kingdom

combined, the result of three consecutive years of more space being vacated than newly rented (Exhibit 1).<sup>9</sup>

Today's competitive pressures mean that real estate owners and operators should rethink their purpose. It's not enough to offer four walls; leading players will help tenants create workplaces that confer a competitive advantage.<sup>10</sup> Expanding into problem solving requires a new operating model, fresh talent and capabilities, and fundamentally different uses of technology.

In office buildings, this new mandate means partnering with employers to understand how they want their employees to use spaces. Workplace solutions could include providing energizing locations where employees want to spend time, dynamic designs that can accommodate both collaborative and individual work, and sensors to track patterns of usage, which can inform an employer's approach to hybrid work.

In retail, there's an opportunity to offer omnichannel delivery solutions, requiring real estate players to view their roles not just as space providers but as lead generators. Solutions include offering new store formats, same-day delivery and fulfillment systems, industrial locations adjacent to stores, and mobile-shopping experiences that can compete with the best aspects of e-commerce.

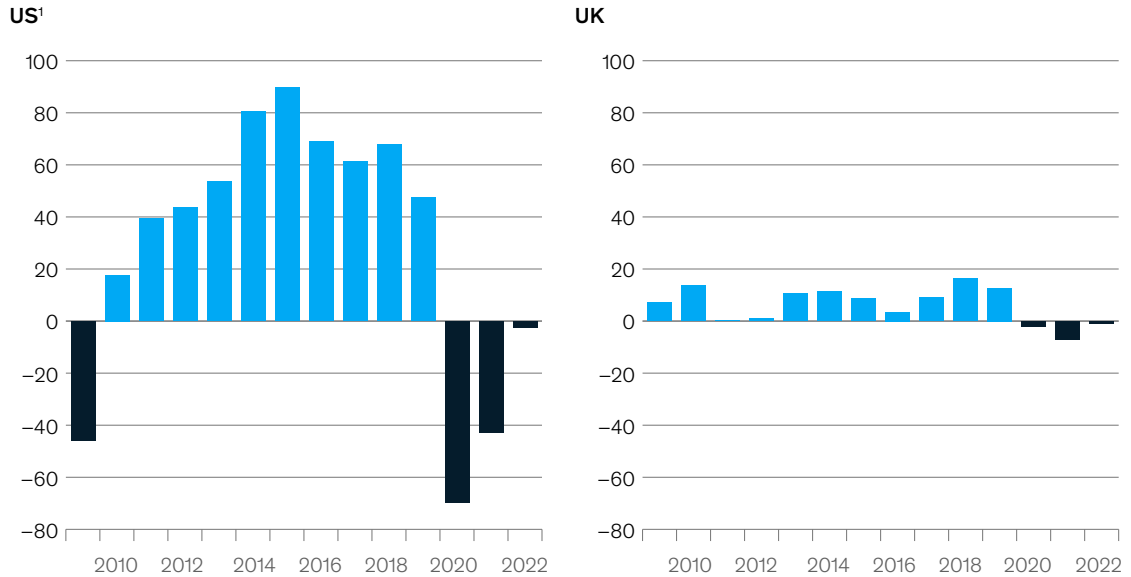
<sup>9</sup> "McKinsey's Private Markets Annual Review," McKinsey, March 24, 2022.

<sup>10</sup> "The Future of the Workplace," McKinsey, accessed February 2022.

Exhibit 1

**In some markets, lower net absorption of office space pressures owners to create new solutions.**

**Office space net absorption, 2007–21, square feet, million**



<sup>1</sup>Top 50 US metro areas.  
Source: CoStar

McKinsey & Company

The shift from providing a static product to providing solutions creates new business opportunities to supply, for example, technology for hybrid work, in-office digital systems for ordering foods and beverages, better omnichannel fulfillment systems, and smart-parking systems.

**Generate momentum via development**

Forecasting the future—of industries, design tastes, or tenant behavior—has always been among real estate developers’ most difficult tasks. But today, expanding cap rates, higher input costs, and lower labor availability<sup>11</sup> raise the stakes. At the same time, rapidly changing behavior makes traditional speculative plays less predictable (Exhibit 2).

Top-performing developers can intentionally create tenant ecosystems that go beyond landing an anchor tenant. Well-designed clusters have the potential to attract anchors and fast followers that benefit from being near one another. Some developments known as magnets for top-tier tech companies, for example, have also proved appealing to residential tenants and buyers—who may work for or with some of the on-site firms. They also attract retailers eager to serve tenants, workers, and visitors.<sup>12</sup> Our analysis points to rewards for players that successfully curate ecosystems based on how people will want to use spaces in five years: in our experience, innovation hubs enjoy a 10 to 12 percent average premium in commercial rents over nearby central business districts.<sup>13</sup>

<sup>11</sup> Lydia O’Neal, “Builders hunt for alternatives to materials in short supply,” *Wall Street Journal*, October 6, 2021.

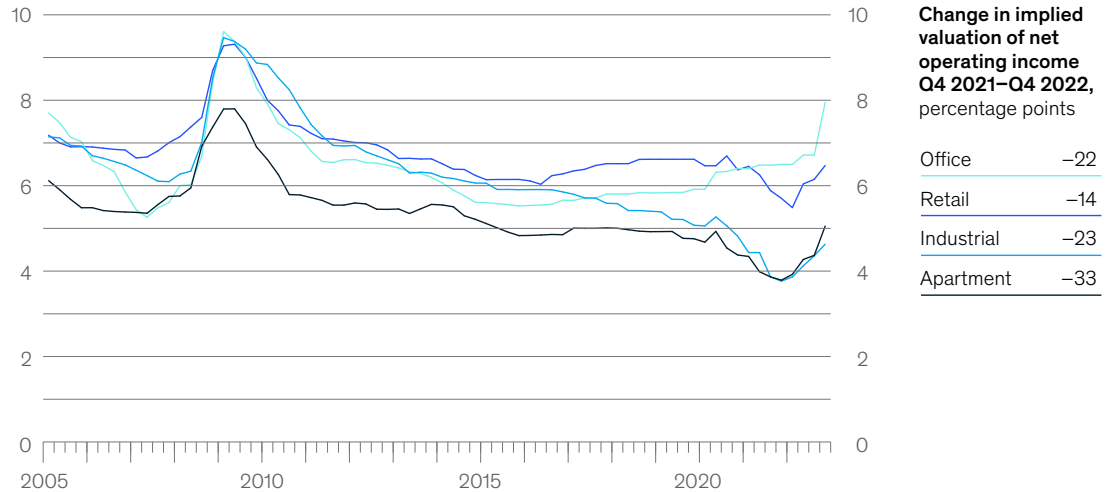
<sup>12</sup> Katy McLaughlin, “L.A.’s new Playa Vista neighborhood is where Silicon Valley meets Southern California,” *Wall Street Journal*, April 12, 2018.

<sup>13</sup> McKinsey analysis.

Exhibit 2

**In early 2022, capitalization rates across all asset types started to increase.**

**Capitalization rates<sup>1</sup> and vacancy rates for major property types in the US, % (quarterly)**



<sup>1</sup>Green Street data include all historical transaction data for asset purchases >\$25 million across all asset classes in the top 50 metropolitan statistical areas. Source: Green Street Cap Rate Observer

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**Invest in value creation throughout the full life cycle**

Outperformance in the decade preceding the pandemic required adept dealmaking. Buying right, making modest operational improvements, and riding contracting cap rates produced strong returns.

Buying right remains critical, but today’s environment emphasizes operations—an area that has grown more competitive. Becoming an operating-platform owner is one critical way in which larger players are taking advantage of their scale and boosting returns.<sup>14</sup> Platforms give tenants a consistent experience and enable leveraged investments in technology (as further discussed below), as well as efficient procurement and finance. Funds greater than \$5 billion, many of

which are platform owners or fully vertically integrated, outperformed funds investing less than \$1 billion by 440 basis points in internal rates of return from 2009 to 2019 (Exhibit 3).<sup>15</sup> In combination, scale and vertical integration enable a consistent experience for tenants, better use of technology, and efficient procurement.

**Embrace sustainability as an opportunity**

Environmental, social, and governance issues—particularly sustainability—have moved from check-the-box items to value-creating activities. Real estate players can think about addressing sustainability in three ways: first, by analyzing existing portfolios through a sustainability perspective in a search for value; second, by

<sup>14</sup> Lisa Prevost, "Seeking an edge, developers and investors turn to 'proptech,'" *New York Times*, May 7, 2019.

<sup>15</sup> McKinsey analysis of Burgiss data as of September 30, 2022.

decarbonizing existing buildings; and third, by building new sustainability-related businesses. Each of these will require cutting-edge digital and analytical tools.

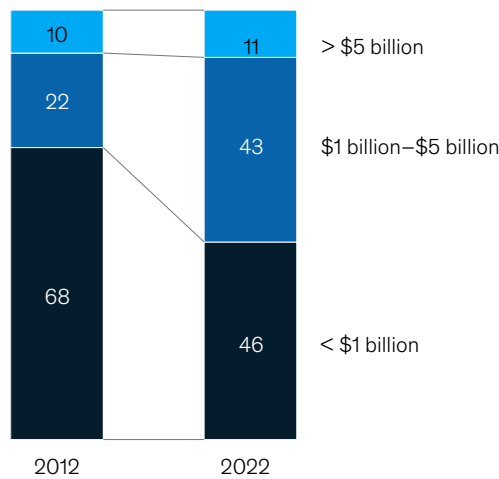
Real estate players would be wise to assess their portfolios through a climate change lens, not least because climate change is already showing up in valuations (Exhibit 4).<sup>16</sup> Owners and operators that don't consider both growing physical risk (such as floods) and transition risk (such as regulatory requirements) may underestimate cap rate expansion, the cost of reducing emissions, or both. With \$7.5 trillion globally at risk for climate-related write-downs,<sup>17</sup> much is at stake.

Climate analytics can help identify mispriced assets and determine whether it's wisest to buy, sell, or retrofit them. Our research indicates that in a diversified commercial real estate portfolio, only 10 percent of the assets drive 80 percent of the risks and that some assets (for example, those in markets with a significant renewable-energy industry) actually benefit from the climate transition. Acquiring assets strategically and adding value through decarbonization improvements strengthens portfolios. The ability to generate returns while meeting climate objectives can also help real estate owners access more capital on better terms.

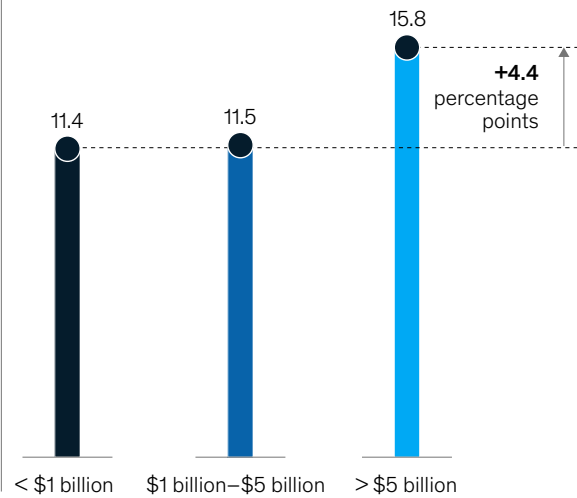
Exhibit 3

### Scale is among the most sustainable advantages in real estate investment management.

Fundraising by fund size, % of total (3-year trailing)



Global real estate fund median internal rate of return (IRR),<sup>1</sup> % (2009-19 vintage year)



<sup>1</sup>Net IRR to date through Sept 30, 2022. Source: Burgiss; Preqin

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<sup>15</sup> McKinsey analysis of Burgiss data as of September 30, 2022.

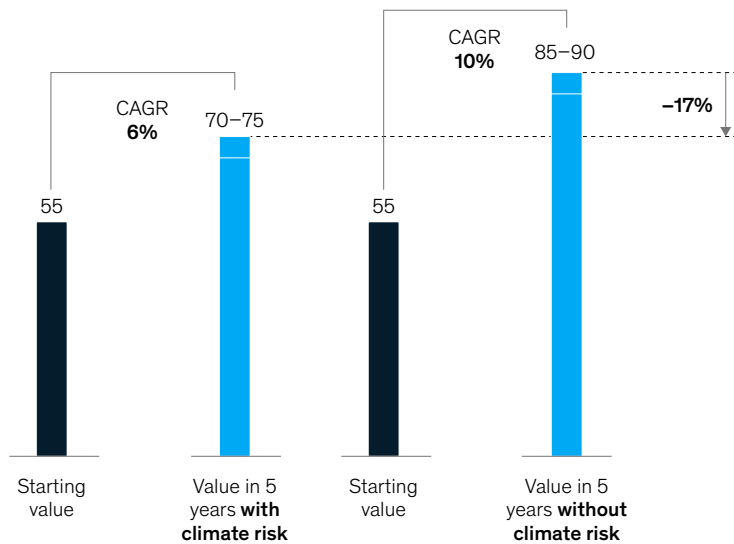
<sup>16</sup> Brodie Boland, Cindy Levy, Rob Palter, and Daniel Stephens, "Climate risk and the opportunity for real estate," McKinsey, February 4, 2022.

<sup>17</sup> Jean Eaglesham and Vipal Monga, "Trillions in assets may be left stranded as companies address climate change," *Wall Street Journal*, November 20, 2021.

Exhibit 4

**Climate change is fundamentally disrupting the real estate industry.**

**Commercial real estate portfolio climate risk (illustrative),<sup>1</sup> \$ billion**



**Real estate will be valued, built, retrofitted, and capitalized differently because of climate change**

**\$7.5 trillion** in total global property value is at risk of “stranding” (major write-downs because of climate risk or inability to decarbonize)

**1,300 major companies** have committed to reducing emissions in line with the 1.5°C pathway

**\$17 trillion** in capital committed to real estate targeting net-zero emissions in 2021

<sup>1</sup>Sanitized portfolio with diversified locations across the US. Devaluation due to combination of physical risks (especially flooding, heat) and transition risks (especially lower rent in markets with carbon-intensive industries). Source: Example analysis on real estate portfolio; Glasgow Financial Alliance for Net Zero; International Renewable Energy Agency; Science Based Targets

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Decarbonizing buildings requires investments but also opens doors to lower energy and operating expenses, as well as a potential green premium on rental income.<sup>18</sup> The smartest operators will not only identify assets that would benefit from improvements (including better insulation, more efficient windows, heat pumps, and rooftop solar) but also find opportunities to improve the economics of their net-zero pathways. We have found that the typical path to net zero is net-present-value (NPV) negative. Operators can create positive NPV-net-zero pathways by using analytics at the portfolio level to figure out the right order for implementation, which assets to invest in at what

times, and how to link actions at the asset level with strategies for purchasing renewables. Operators can also significantly increase the value of their assets and portfolios by taking additional steps, such as measuring emissions and communicating them to tenants, leveraging scale for better procurement, and incorporating these insights into the investment process.

The climate challenge also introduces opportunities to build new businesses, such as offering emissions reduction services to other owners, generating and storing energy on-site, or providing climate resilience services to local communities.

<sup>18</sup> Christian Ulbrich, “The conversation about green real estate is moving on as corporates prioritize sustainability,” World Economic Forum, January 12, 2022.

# Today, the largest real estate owners are collecting and harnessing the power of their vast data troves to make better decisions.

## Embed digital in everything

Real estate was once an industry years behind in digital capabilities,<sup>19</sup> but it is now catching up. Today, the largest owners are collecting and harnessing the power of their vast data troves to make better decisions and build applications that serve asset managers, tenants, and residents alike. The next phase of the industry's digital transformation requires improved change management and fundamentally new ways of approaching the business. It also calls for investments in new types of talent (including developers, engineers, and data scientists) to build, maintain, and enhance the tools that the transformation requires.

Traditional valuation methodologies rely heavily on comparable sales. Greater uncertainty in the demand for commercial properties, the macroeconomic environment, and the impact of climate change on valuations all render these less effective. Players using nontraditional data and advanced analytics to value properties and negotiate leases can often move more quickly and confidently, winning more deals and paying the right price. Advanced analytics and climate analytics can both confirm experienced-based knowledge and create new insights (Exhibit 5). In one digital-analytics-powered model we built for a US West Coast city, for example, we learned that proximity to a gas station had a negative impact on the growth of rents, but proximity to a high number of five-star

Yelp-reviewed restaurants had a strong positive effect on it.

Applications are not only using data to improve decision making but also making the lives of residents and tenants easier—for example, with online rental platforms, maintenance request forms, and community engagement apps.<sup>20</sup> Other tools can help make operations more efficient: digital implementation can increase net operating income (NOI) by 10 percent or more—a dramatic improvement on traditional levers.<sup>21</sup> It's not surprising that property technology (proptech) companies have been highly attractive for venture capital and private equity investors: investment topped \$50 billion for the first time in 2021.<sup>22</sup> The most advanced operators are doing more than merely buying or subscribing to proptech applications: they are building their own and transforming their processes to maximize the value created by the tech they build.

## Focus on operating efficiency, not just on income

Input costs—including labor, materials, and financing—have grown rapidly. Meanwhile, inflation exceeds previous norms for contractual or episodic rent increases in commercial real estate. To keep pace with the changing economics, owners and managers must act on both costs and revenues.

<sup>19</sup> Gabriel Morgan Asaftei, Sudeep Doshi, John Means, and Aditya Sanghvi, "Getting ahead of the market: How big data is transforming real estate," McKinsey, October 8, 2018.

<sup>20</sup> Stefanos Chen, "Covid pushes real estate into the future," *New York Times*, November 13, 2020.

<sup>21</sup> McKinsey analysis.

<sup>22</sup> McKinsey analysis of Pitchbook data.



Exhibit 5

**Advanced analytics can unearth real estate opportunities by using dynamic nontraditional data.**

**Advanced analytics real estate illustrative dashboard**



<sup>1</sup>Statistics calculated based on US Postal Service address change data.

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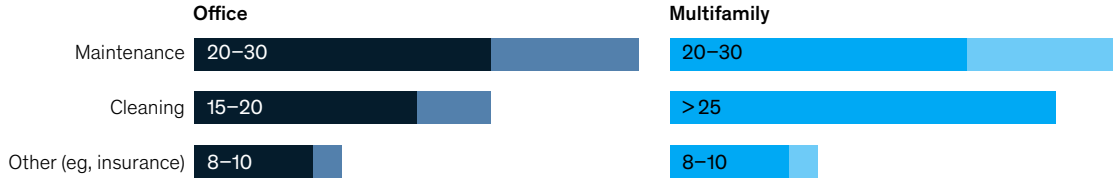
On the cost side, building resilient supply chains and controlling operating costs can offset potential NOI margin declines (Exhibit 6). Large owners in a given market can, for example, centralize leasing teams and give them digital tools that help make value-creating leasing decisions. Owners can also consider consolidating and renegotiating contracts for energy and maintenance services across a portfolio's properties. With financing costs higher, maintaining high credit ratings, finding low-cost capital, and refinancing regularly will also be necessary to produce returns.

On the revenue side, current market conditions require greater leasing intelligence. Commercial rents can match rising prices if operators flex all their levers (including leases with duration and escalation clauses) and tools (including advanced analytics and superior market research). Real estate has long been considered an inflation hedge for limited partners; to deliver on that promise, general partners must keep pace to ensure that commercial rents match the rising price environment.

Exhibit 6

**Real estate operators can reduce property-level costs in key categories.**

**Estimated savings potential as a share of existing cost, %**



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Sea changes in behavior and mindsets, as well as current economic conditions, are converging to create an era of change in real estate. Those who embrace the challenges—rethinking what the market demands, which technologies are required, and how to use new talent—will position

themselves for success. Competitors who fail to adapt may be left behind. Build the real estate that tenants want—and provide the experience that employees, shoppers, and residents need—and they will indeed come.

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# From start-up to scale-up: Accelerating growth in construction technology

To achieve scale, founders, executives, and investors in construction technology need to eliminate the barriers to efficient growth. Here's how.

*by Jose Luis Blanco, David Rockhill, Aditya Sanghvi, and Alberto Torres*



**Construction sites** in 2023 might in many ways resemble those in 1923, with manual bricklaying, paper blueprints, and scaffold towers. At \$12 trillion,<sup>1</sup> architecture, engineering, and construction (AEC) is one of the biggest industries in the world, but historically, it has been among the slowest to digitize and innovate.

This, however, is changing fast: strong demand for infrastructure, a shortage of skilled labor, and increased stakeholder pressure for data transparency and integration are all accelerating digital adoption. As a result, the AEC tech ecosystem has experienced an explosion of investment and a wave of start-up launches. An estimated \$50 billion was invested in AEC tech between 2020 to 2022, 85 percent higher than the previous three years. During the same period, the number of deals in the industry increased 30 percent to 1,229 (Exhibit 1).

Although the AEC tech industry is maturing, it is not yet at the scale and sophistication of more established

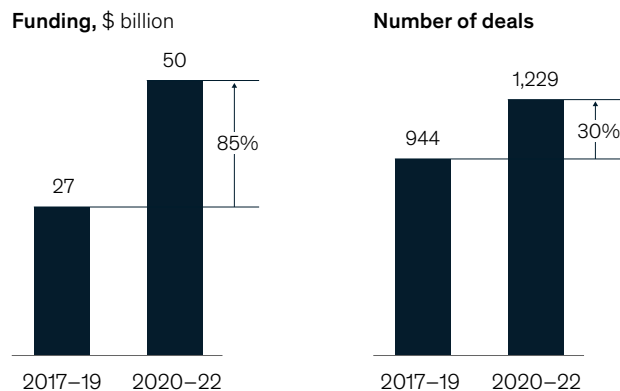
software markets such as logistics, manufacturing, and agriculture. The industry boasts fewer scale-ups and unicorns relative to its size. And it is hard for AEC tech companies to grow efficiently due to several dynamics among AEC customers, including fragmentation, low IT spend (relative to other industries), and entrenched analog ways of working.

In this environment, how can AEC tech companies accelerate adoption and sales and achieve scale? To answer this question, we surveyed approximately 100 investors and AEC tech players in 2022 and interviewed founders, investors, and large software companies in the industry. Using primary research and publicly available data, we also mapped and analyzed more than 3,000 AEC tech companies.<sup>2</sup> In this article, we review the findings of that research. We outline the investment trends that are accelerating the digitization of the industry, and we suggest how tech businesses, and their investors, can address challenges to get on a path of efficient growth.

Exhibit 1

## Global investment in architecture, engineering, and construction tech grew to \$50 billion between 2020 and 2022.

### Global deals in AEC tech<sup>1</sup>



<sup>1</sup>AEC = architecture, engineering, and construction. Incl management buyout, management buy-in, add-on, secondary buyout, public to private, growth and expansion, and private investment in public equity.  
Source: PitchBook, November 15, 2022

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<sup>1</sup> Oxford Economics, March 2023.

<sup>2</sup> PitchBook, November 15, 2022.

## Trends accelerating the digitization of AEC

Digitization of the AEC industry started gathering steam a decade ago, but the pace has accelerated over the past three years—and a number of trends suggest it will continue to do so (see sidebar, “What do we mean by architecture, engineering, and construction tech?”).

### Economic factors and regulation are prompting investment

A combination of supply-and-demand factors are prompting investment in AEC tech. On one hand, global demand for long-term construction is strong, in part because of increased stimulus by governments, such as the \$1.2 trillion Bipartisan Infrastructure Law in the United States and the €800 billion NextGenerationEU fund in Europe. More asset owners are also investing sizable capital to decarbonize their portfolios to make them climate resilient. On the other hand, there is a shortage of skilled workers as more retire or transition to other industries. The United States has 440,000 vacancies in AEC, compared with around 300,000 in 2019, whereas the United Kingdom’s vacancies have nearly doubled since 2019.<sup>3</sup> The industry is deploying digital technology to help increase productivity and bridge this gap between supply and demand.

Meanwhile, regulatory changes aimed at creating a more connected industry are reinforcing this wave of digitization. For example, the United Kingdom’s Building Safety Act requires a digital ledger of all building data for new residential buildings, and Sweden’s ID06 requires digital records of all the construction workers on a construction site.

### Investor optimism is high

Investment in AEC tech has grown multifold and, based on our research, more and more investors are recognizing AEC tech’s potential to fundamentally change the structure of the construction industry and redistribute value pools at scale. This momentum is likely to continue. Seventy-seven percent of the

respondents to our survey expect to invest in AEC tech at similar or higher levels in 2023, and 64 percent see it generating higher returns versus other verticals.

### The tech scene is maturing

The proportion of late-stage venture capital in total AEC tech investment totaled \$11.5 billion between 2020 and 2022, more than triple that of the previous three years (Exhibit 2). Meanwhile, M&A continues to be the largest source of funding for AEC tech ventures, accounting for 48 percent of all investments and 68 percent of all exits. The growth of the industry is further reflected in the fact that the median deal size and post-money valuation<sup>4</sup> in the industry has more than doubled since 2017 (Exhibit 3).

### Companies and customers are still seeking interoperability

In 2020, we observed that AEC tech players were targeting multiple use cases to address customer pain points.<sup>5</sup> This trend has continued, led by customer demand for interoperability—either through virtual platforms built using open standards and workflows, such as openBIM, or with one-stop-shop platforms such as those developed by some of the largest AEC tech companies. Indeed, nearly half of the companies we analyzed offer customers solutions that address three or more use cases.

### AEC technology and property technology are converging

Until now, AEC tech and property technology (proptech) have evolved as separate ecosystems. AEC tech has focused on the design and construction of assets, while proptech has focused on the financing, planning, operation, and maintenance aspects of assets. This is starting to change, as customers and technology players see value in connecting the two. Our analysis shows that 20 percent of AEC tech companies also address at least one proptech use case: for example, linking the design and operation of building management systems using a digital twin.

<sup>3</sup> “Construction: NAICS 23,” US Bureau of Labor Statistics, 2023; “UK job vacancies (thousand): Construction,” UK Office for National Statistics, March 2023.

<sup>4</sup> Post-money valuation is a measure of a company’s valuation that includes all external investments.

<sup>5</sup> “Rise of the platform era: The next chapter in construction technology,” McKinsey, October 30, 2020.

# What do we mean by architecture, engineering, and construction tech?

A variety of software and tech is used across the architecture, engineering, and construction (AEC) industry. It includes

design software, robotics, and tools for the planning, scheduling, budgeting, and performance management of projects

(exhibit). Companies in the AEC tech industry range from multibillion-dollar software giants to one-person start-ups.

Exhibit

## Software and tech are used across the architecture, engineering, and construction project life cycle, from earliest stage to maintenance.

### Use of software and tech in AEC<sup>1</sup> projects



<sup>1</sup>Architecture, engineering, and construction. <sup>2</sup>Request for information. <sup>3</sup>Building information management. <sup>4</sup>Virtual reality and augmented reality. <sup>5</sup>Health, safety, and environment. <sup>6</sup>Environmental, social, and governance.

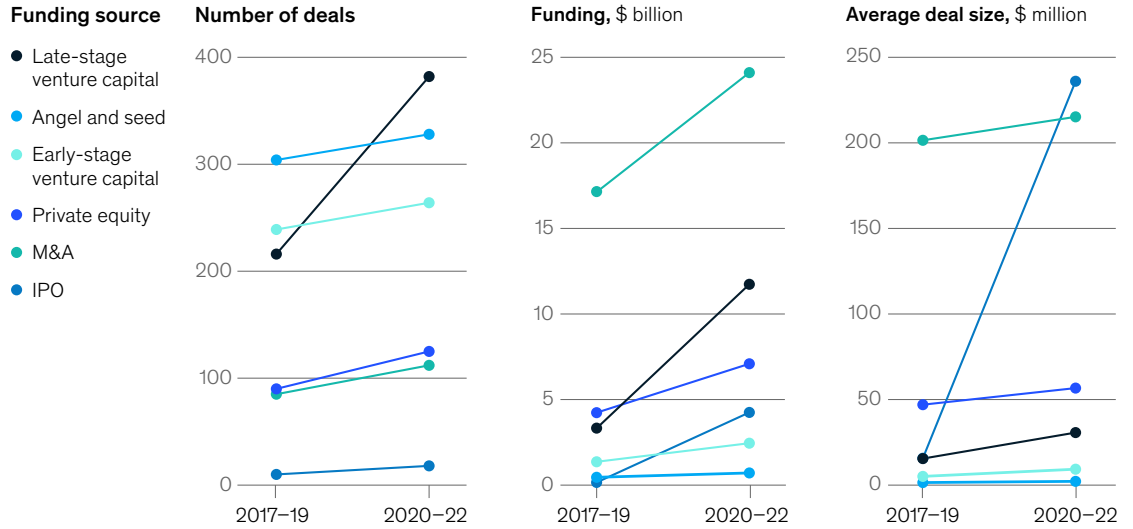
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Exhibit 2

**Funding sources for architecture, engineering, and construction tech are evolving, with late-stage venture capital investors gaining prominence.**

**Global deals in AEC tech, by funding round<sup>1</sup>**

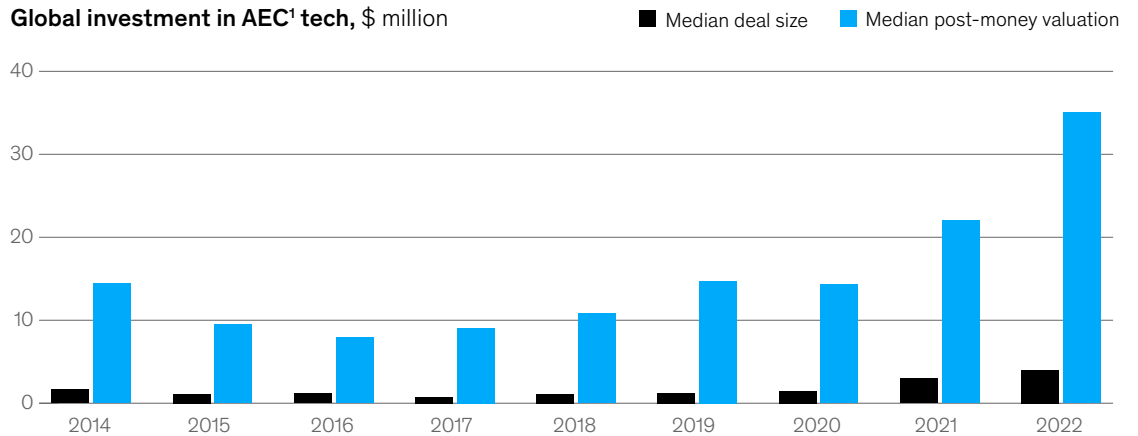


<sup>1</sup>AEC = architecture, engineering, and construction. Incl management buyout, management buy-in, add-on, secondary buyout, public to private, growth and expansion, and private investment in public equity.  
Source: PitchBook, November 15, 2022

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Exhibit 3

**The rapid growth of architecture, engineering, and construction tech since 2017 is reflected in increased median deal size and post-money valuation.**



<sup>1</sup>Architecture, engineering, and construction.  
Source: PitchBook, November 15, 2022

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## Hurdles to scale AEC tech investments remain

While the trends above have helped expand the ecosystem of AEC-focused tech businesses and start-ups, investors and founders still wonder how best to pursue efficient growth—defined as the ability to grow annual recurring revenues (ARR) and to generate free cash flow (FCF) from those revenues.<sup>6</sup> Our analysis across industries shows that as software companies expand, efficient growth increasingly correlates strongly with valuations (Exhibit 4).

Within the AEC technology industry, however, our research also indicates that efficient growth is particularly tough to achieve for four reasons:

1. **Customer fragmentation.** The average construction company employs fewer than ten people. The average project involves more than 100 different suppliers and subcontractors. So achieving scale requires selling to a large number of companies. This means that sales growth can be labor intensive and slow. As one investor noted, “This is a risk-averse and fragmented sector at its core, so growth is slow, but it is extremely sticky.”
2. **Multiple customer personas.** Founders frequently tell us that identifying the *real* customer is tough because they lack a clear understanding of user versus buyer personas. Depending on the project, for example, the customer could be the project manager, IT manager, or procurement manager. And often, purchase decisions are made at the project level, not the enterprise level. As a result, companies need to resell the product again to the next project, which drives down net retention and raises acquisition costs. As one investor said, “The most successful companies have a plan to sell to the enterprise, not just the project.”
3. **Low margins and economic headwinds.** Making the case for spending on software can be tough for AEC companies when there is

limited capacity for investment. The industry has low margins and increasing economic headwinds, including materials cost inflation. Moreover, the typical IT spend for AEC companies is 1 to 2 percent of the revenue, compared with the 3 to 5 percent average across industries.<sup>7</sup> Against this backdrop, solutions must come with a business case. Although ROI can be high, until recently players have not been effective at quantifying benefits. As one investor said, “In a low-margin industry, and in this market environment in particular, it is important that companies can clearly demonstrate and measure the cost-saving benefits of their product.”

4. **Adoption and scaling challenges.** Driving tech adoption in a projects business such as construction poses several challenges: users often switch products among different projects—sometimes they need to adopt different tools depending on client preferences, and staff come and go. Furthermore, the industry has traditionally had limited digital capabilities, although this is changing as workers become accustomed to using digital technology in their everyday lives. And as one AEC company executive said, “The pandemic forced us to accelerate adoption from the office to the site overnight.”

## Strategies for scaling AEC tech businesses

For companies that can overcome these barriers, there is a big prize up for grabs: a customer base that is larger than most other industries. So what does it take? Our analysis of tech companies in AEC, as well as other industries such as manufacturing, travel, and logistics, shows five common growth characteristics.

### Pursue a big total addressable market and a bold vision

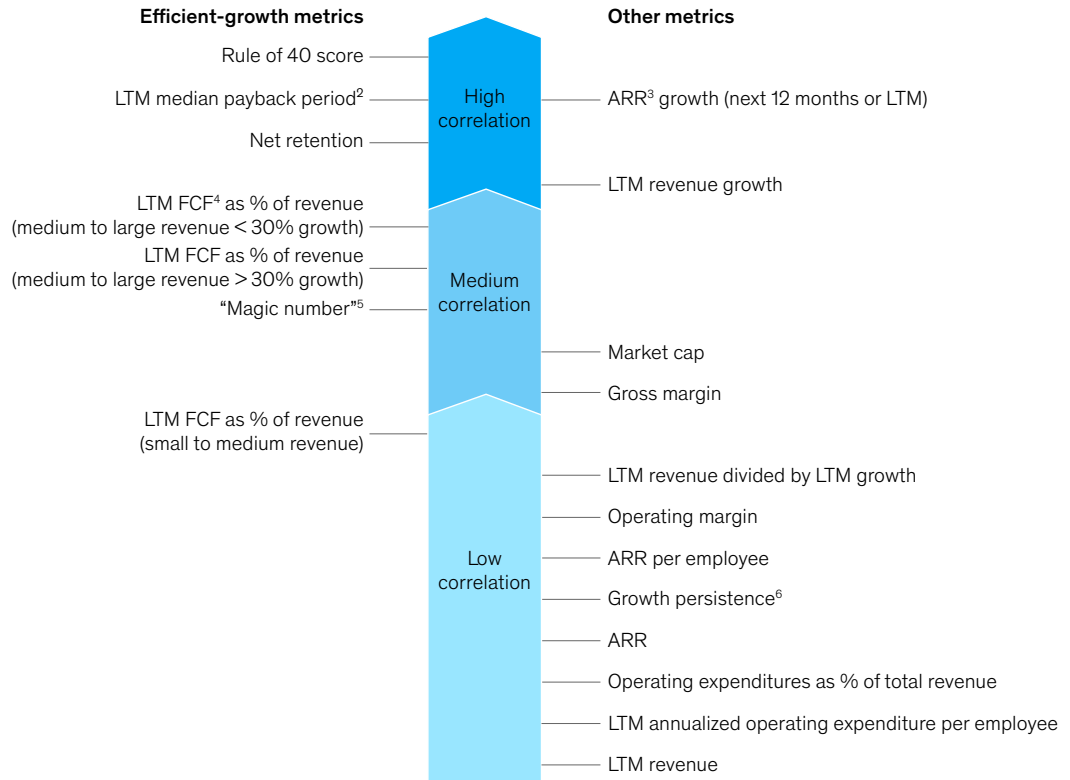
As one investor told us, “If the extent of your vision is to sell tools to solve a niche problem, then we’re

<sup>6</sup> Annual recurring revenue is the revenue that a company (often businesses that operate on a subscription-based model) expects to receive from customers on an annual basis. Free cash flow is the cash generated by a company after paying operating expenses and capital expenditures.

<sup>7</sup> “Gartner top strategic technology trends for 2022,” Gartner, October 2021.

## Enterprise value in software companies typically correlates with efficient growth metrics.

### Correlation of metrics with valuations for SaaS companies<sup>1</sup>



<sup>1</sup> SaaS = software as a service. Based on analysis across 100 software-as-a-service companies of correlation with enterprise value divided by next-12-months revenue multiple. <sup>2</sup> LTM = last 12 months. Median payback period from latest 4 quarters; payback period = 1 / (gross margin × [new annual recurring revenues in quarter / sales and marketing in previous quarter]). <sup>3</sup> Annual recurring revenue. <sup>4</sup> Free cash flow. <sup>5</sup> Net new revenue divided by spending on sales and marketing in previous quarter. <sup>6</sup> Current quarter revenue growth divided by previous year's revenue growth in same quarter.

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not excited. We are looking for founders with vision and mission to improve outcomes for big swathes of the market.” Having a bold vision—and being able to effectively articulate how it benefits the user and the broader industry—helps attract talent, investors, and customers, and allows companies to move faster as they continually course-correct toward a North Star. For example, one AEC tech company focuses on improving predictability of project outcomes and uses that simple vision to expand the total addressable market (TAM) beyond contractors and planners to

cover a far broader customer set, including project owners, banks, and insurance companies.

A bold vision usually means founders are thinking about the entire AEC tech ecosystem and figuring out ways in which their company can work with other providers to create a seamless user experience and unlock newfound value for a broader set of customers. For example, one AEC design platform expanded its core offering beyond architects and engineers to connect to product

suppliers, and thus monetize transactions for building products used in designs.

### **Achieve a great product-market fit**

Finding the right product-market fit is a key part of the investment decision-making process for investors in most industries, but AEC tech companies often do not get it right. In fact, as our survey indicates, the most common issues observed by AEC tech investors are an overfocus on engineering (rather than product and market fit) and product fragmentation (Exhibit 5).

As one AEC tech player noted, “Niche, technical design tools are often built by self-taught developers and construction professionals who built the tool to solve a specific problem or fill a gap in their workflow. As such, the very nature of those tools focuses on the tech and not the user experience.” In our discussions with start-ups and investors, three common themes emerged that can help create a better product-market fit. All three elements require strong product management capabilities.

First is focus. Because customer needs differ across segments, companies would do well to focus on one or a few specific segments, whether they are targeting architects or subcontractors or distributors. As one founder put it, “I have potential customers in manufacturing, retail, construction, and facilities management across more than ten geographies, but we have to focus, or we will achieve nothing.”

Second is feedback. As one investor told us, “Many contech [construction technology] firms are founded by industry professionals who launched their business to solve a problem, so they have huge product focus. We need to see more founders with a balanced product and market/customer focus.” One way to sharpen market focus is to build a network of customers and collaborators. Most successful players do this through their investors’ networks and beta customers, who benefit from low-cost early releases in return for investment in testing and development feedback. And a side benefit is that they can provide access to a critical mass of other customers (Exhibit 6).

Third is flexibility. Nearly every start-up and scale-up we have spoken to has seen a big shift in their product proposition because they responded to market views and kept evolving to optimize the product-market fit. For example, one start-up developed an app to measure material waste from construction sites but eventually evolved it to measure embodied carbon in materials.

### **Build a customer acquisition engine with a scalable revenue and distribution model**

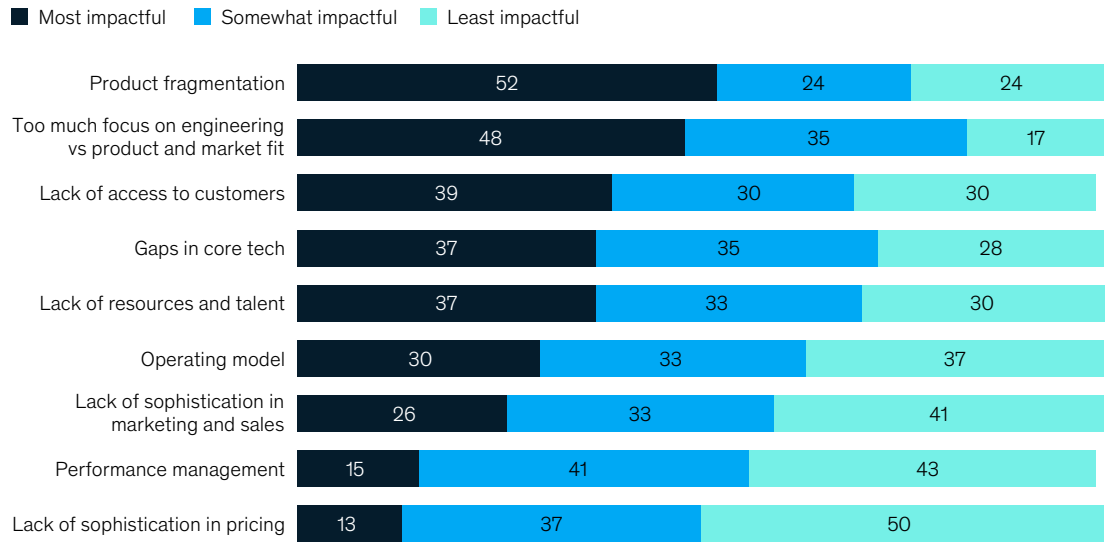
Valuations for start-ups are tied strongly with the ARR growth metric. In a fragmented market such as AEC, customer acquisition is difficult and expensive. Based on our research, leading players differentiate themselves with three moves to maximize the ARR bang for each buck spent on marketing and R&D:

- *Deliver a scalable revenue model.* As one investor said, “Some products require so much customization that the software company becomes a consultancy.” Successful businesses have a product that can be deployed with minimal customization and training (and that usually means software rather than hardware). And where customization or training is required, they invest time only in high-potential customers and often partner with independent software vendors to deliver at scale.
- *Find creative routes to market.* You’re never going to crack the market one customer at a time. Successful players use their investors and existing customers to open new routes to market. They also lock in users early. For example, one design software player gave away free copies of its software to architecture students, who then took it to their new employers. Moreover, these players have a channel strategy aligned with customer tiers, and that includes not only value-added resellers (VARs) and distributors but also low-cost remote channels (including multilingual remote inside-sales centers) and self-serve, web shop, and e-commerce.
- *Supercharge the sales team.* Successful software companies offer incentives to their

Exhibit 5

**Product fragmentation, product and market fit, and access to customers affect profitable growth in architecture, engineering, and construction tech.**

**Impact of barriers to profitable growth in AEC tech,<sup>1</sup> % of respondents**



Note: Figures may not sum to 100%, because of rounding.  
<sup>1</sup>AEC = architecture, engineering, and construction. Question: What are the most impactful barriers to profitable growth in construction tech?  
 Source: McKinsey survey of 104 AEC tech investors and operators, 2022

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direct-sales teams to cross-sell and upsell and drive key account management capabilities. One leading player with multiple brands centralized its go-to-market strategy across brands to accelerate cross-sell and upsell and capped bonuses on some established products to encourage sales of new products. The best sales organizations are underpinned by data that allows them to see the relationship between specific, often siloed, sales and marketing activities and overall growth outcomes.

**Improve net retention with customer success**

Our analysis shows that as software companies grow, the most important driver of valuation shifts from pure growth, often measured by ARR, to include the ability to generate FCF from ARR. In short, it's not enough to just have customers; you

need to earn money from them. In what is commonly referred to as the "rule of 40," the sum of percentage growth and the FCF rate should equal 40 percent or higher.<sup>8</sup>

Achieving strong FCF is in large part about optimizing the payback period—that is, how long does it take to recover your customer acquisition costs. This means acquiring new customers efficiently, retaining customers, and upselling and cross-selling to them. This is measured by net retention rate (NRR),<sup>9</sup> which requires a laser focus on customer success. Across sectors, companies with high NRRs demonstrate three common characteristics:

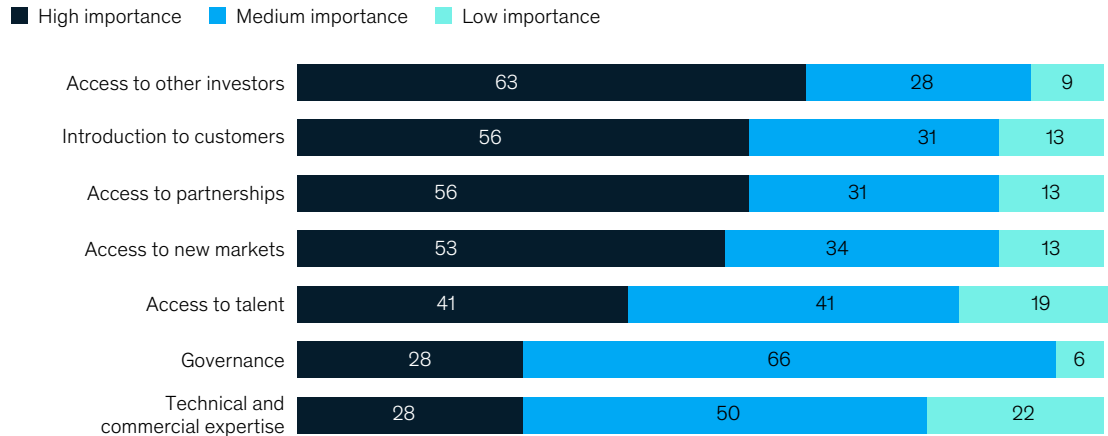
- *They know their numbers.* At the heart of customer success is a data-driven understanding of how customers obtain

<sup>8</sup> Paul Roche and Sid Tandon, "SaaS and the Rule of 40: Keys to the critical value creation metric," McKinsey, August 3, 2021.  
<sup>9</sup> Net retention rate is a metric that shows how effective a company is at driving growth in its existing customer base while keeping the churn low.

Exhibit 6

**Aside from capital, the most important thing investors bring to architecture, engineering, and construction tech companies is access to their networks.**

**Importance of investor contributions (excl capital) to AEC tech companies,<sup>1</sup> % of respondents**



Note: Figures may not sum to 100%, because of rounding.  
<sup>1</sup>AEC = architecture, engineering, and construction. Question: Apart from capital, what are the most important things that investors bring to tech companies in the sector?  
 Source: McKinsey survey of 104 AEC tech investors and operators, 2022

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value from a specific product. Maximizing NRR is a game of inches, so leaders analyze the many drivers of growth and churn (upsell, contract cancellation, additional licenses, and so on) at a customer level and respond with targeted interventions (for example, offering bundles for additional “seats” as usage reaches contract limits).

- **They set up a dedicated customer success function.** A team that can work with customers to get maximum value from the product is particularly important in AEC, where customers are less digitally mature and solutions are less well established. For example, the largest AEC technology companies have customer success teams and run conferences and training for their users. One software company hired a retired construction contractor for its customer success function to better understand customer needs.

- **They deliver customer success at low cost.** Customer success does not have to mean dedicated (and expensive) customer support. It can often be delivered at lower cost by cultivating user communities and promoting the use of online tutorials, for example. One AEC tech company gained thousands of users on zero-marketing spend by leveraging its community forums and industry networks—effectively putting its own customers to work.

**Build functional maturity as you scale**

As software companies grow beyond the start-up and scale-up stages, growth rates slow, and FCF (and hence, valuation) is increasingly driven by operational efficiency. This typically comes down to optimizing NRR as well as marketing and sales spend (which can be 50 percent or more of the revenues of typical software companies). At-scale software companies in the top quartile for valuation typically exhibit the following characteristics<sup>10</sup>:

<sup>10</sup> “SaaS and the Rule of 40,” 2021.



# As software companies grow beyond the start-up and scale-up stages, growth rates slow, and free cash flow (and hence, valuation) is increasingly driven by operational efficiency.

- *Optimize marketing and sales spend.* Leading software players allocate marketing and sales spend against future, not past, revenue opportunities to give high-growth accounts the biggest coverage. They also continuously segment customers, targeting lower-potential customers through web sales or e-commerce and inside sales while increasing spend on the highest-potential customers.
- *Continuously optimize pricing and track impact.* Leading players build customer business cases to link pricing to the value generated for customers. They also track the impact of pricing changes in near real time and optimize accordingly. Companies would also do well to make sure their payment terms are right. As one investor explained, AEC tech players often price based on a project or milestone. “This is not ARR, even though some may call it that. And because construction is often subject to delays, this means the risk attached to these revenue streams is very high, which puts off potential investors.”
- *Lean on data and automate processes.* Successful software companies leverage data, AI, and automated processes across the business in a variety of ways, including identifying leads and proactively targeting cross-sell and upsell opportunities, leveraging usage information in pricing and product decisions, and assessing developer velocity.
- *Strengthen the business-building muscle.* Tech companies of every size often reach the tip of a growth curve without a market-ready venture or offering that can pick up the slack, so their growth dips. Leading players maintain momentum by launching net-new businesses more quickly. They incubate new businesses thoughtfully, with dedicated resourcing for product development and go to market.

---

Several tailwinds are powering growth in the AEC tech industry despite the near-term challenges of the economic slowdown. To capitalize on the investment opportunities and achieve efficient growth, investors and tech companies can learn from the most successful AEC tech companies and catch the wave in this exciting industry.

**Jose Luis Blanco** and **Aditya Sanghvi** are senior partners in McKinsey's New York office, **David Rockhill** is a partner in the London office, and **Alberto Torres** is a partner in the Madrid office.

The authors wish to thank Daniele Di Mattia, Julien Gagnon, Josh Johnson, and Adam Singer for their contributions to this article.

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## Chapter 5

# Highlights from McKinsey's 2023 sector research

Amid uncertainty, companies across industries are continuing to innovate, diversify and find new investment opportunities.



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Aerospace & Defense

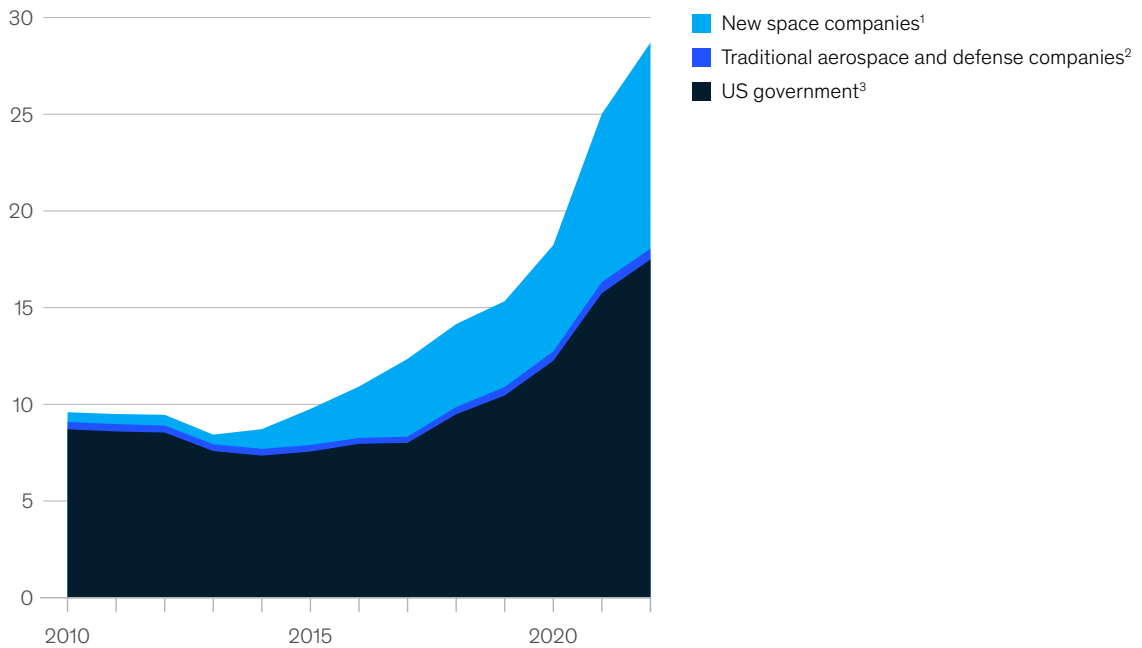
# Space: The missing element of your strategy

by Ryan Brukart, Jesse Klempner, Bob Sternfels, and Brooke Stokes

The space economy is at an inflection point. The sector is now valued at nearly half a trillion dollars and is growing at about 9 percent annually, according to McKinsey estimates. While the US government remains the primary source of funding, private companies, especially new space players, have substantially increased their investment in recent years. Private-sector funding in space-related companies topped \$10 billion in 2021—nearly a tenfold increase over the past decade (2022, despite much angst, had the second-most inflows in history). If the current momentum continues, commercial funding for space ventures could surpass government funding in the next 20 years.

## New space companies are increasingly fueling space-related R&D spending.

Space-related R&D expenditures, by source, \$ billion



<sup>1</sup>This category includes space companies founded since 2000. It assumes that most funding going into these companies is for R&D. Larger funding raises were smoothed to reflect estimated R&D spend over time. The percentage also includes estimated profit reinvested into R&D.

<sup>2</sup>Space-related R&D estimated based on percentage of estimated space-related revenues to total revenues where required. Reflects only estimated nonrecoverable R&D spend (ie, not recovered in rates).

<sup>3</sup>Based on fiscal years. Includes estimated classified space funding and reflects only estimated nonprogram office spending.

Source: Company financial statements; Crunchbase; expert interviews; Corporate Performance Analytics by McKinsey; Radar by McKinsey; McKinsey analysis



Agriculture

# Trends driving automation on the farm

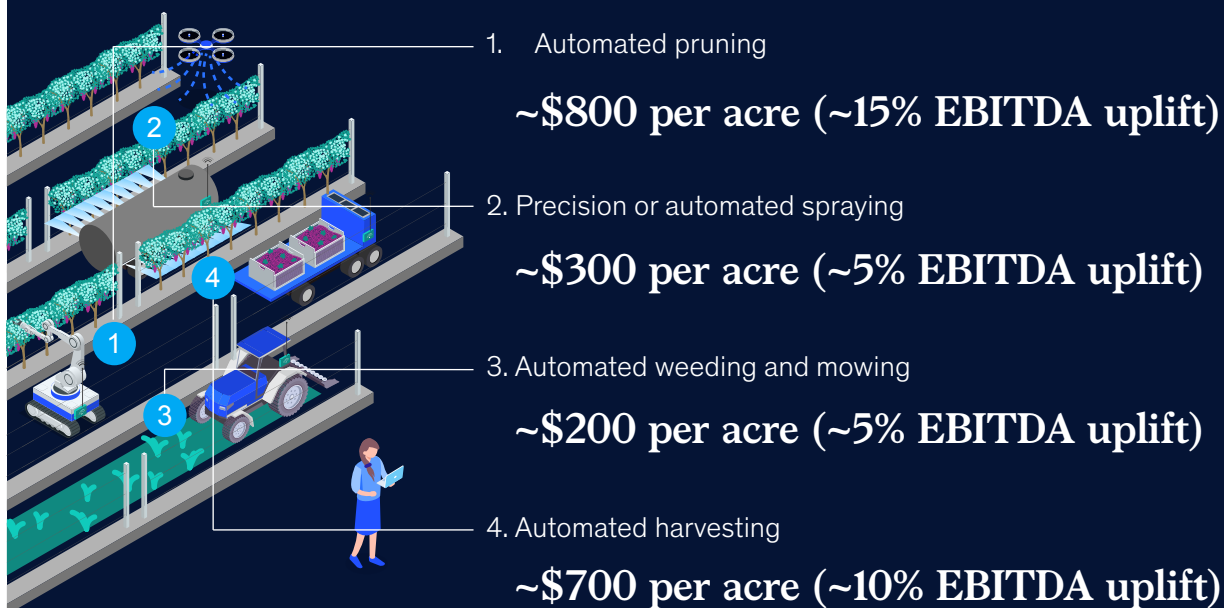
by Rob Bland, Vasanth Ganesan, Evania Hong, and Julia Kalanik

Economic pressures, labor challenges and the push toward growing practices that are more sustainable are prompting farmers to explore automation. The potential benefits are multifold. By using sensors, analytics, and robotics, farmers can make smarter decisions in the field and do more with less. With help from artificial intelligence, they can improve planning processes and better understand what inputs to apply at what times and at what rates to ensure profitable and sustainable outcomes. In vineyards, for example, automating various farming tasks can help deliver more than \$200 to \$800 per acre per year in value, doubling to quadrupling the returns on farmers' investments in the technology. The passive data collection abilities of autonomous machines have the potential to unlock a completely new set of applications, such as improving food traceability and proactive disease management.

© by muratdeniz/Getty Images

## Farm automation technologies can deliver \$200 to \$800 per acre in vineyards.

Value delivered from farm automation use cases driven by yield uplift and cost savings (CA vineyards)



Source: Jeremy Murdock and Daniel A. Sumner, 2021 sample costs to establish a vineyard and produce winegrapes: Chardonnay Variety: Livermore Valley—Alameda County, University of California, Davis campus, 2021; McKinsey analysis





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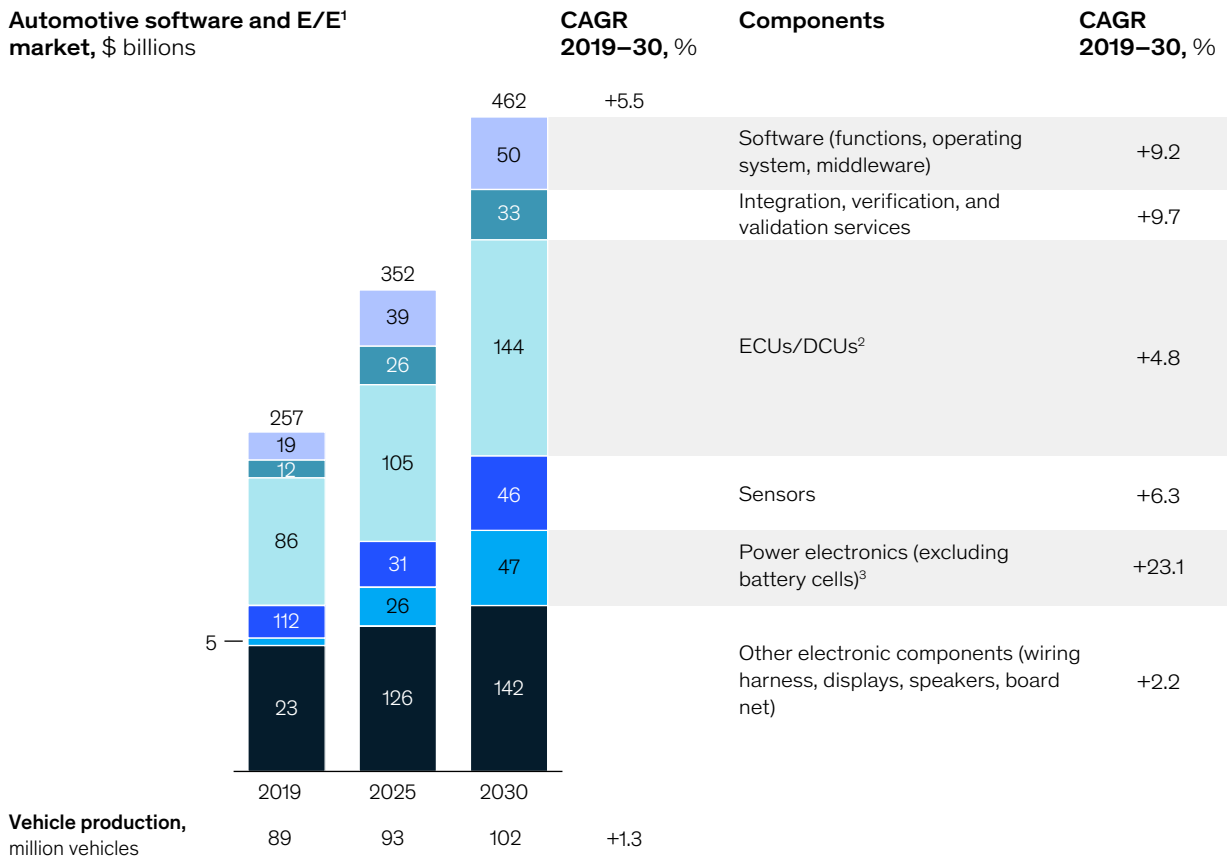
Automotive & Assembly

# Key themes shaping automotive software and electronics through 2030

by Ondrej Burkacky, Johannes Deichmann, Michael Guggenheimer, and Martin Kellner

Growth in the market for automotive software and electronics has been supercharged, buoyed by trends such as autonomous driving, connected vehicles, powertrain electrification, and shared mobility. By 2030, the market is expected to reach \$468 billion in size, representing a 7.1 percent CAGR from 2019 to 2030, according to McKinsey. The market for electronic control units and domain control units will be the largest driver of this growth, with estimated sales of \$147 billion by 2030. Meanwhile, power electronics is projected to be the fastest-growing subsector, with electric-vehicle adoption fueling a 23 percent CAGR during the same period.

**The automotive software and electronics market is expected to grow at 5.5 percent per year through 2030.**



Note: This is a forecast for light vehicles, including passenger cars and light commercial vehicles. Figures may not sum to 100%, because of rounding.  
<sup>1</sup>Electrical and electronic components.  
<sup>2</sup>Electronic control units and domain control units. Hardware only.  
<sup>3</sup>Includes onboard charger, DC/DC converter, and high-voltage inverter.  
 Source: McKinsey Center for Future Mobility Current Trajectory Scenario



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Chemicals

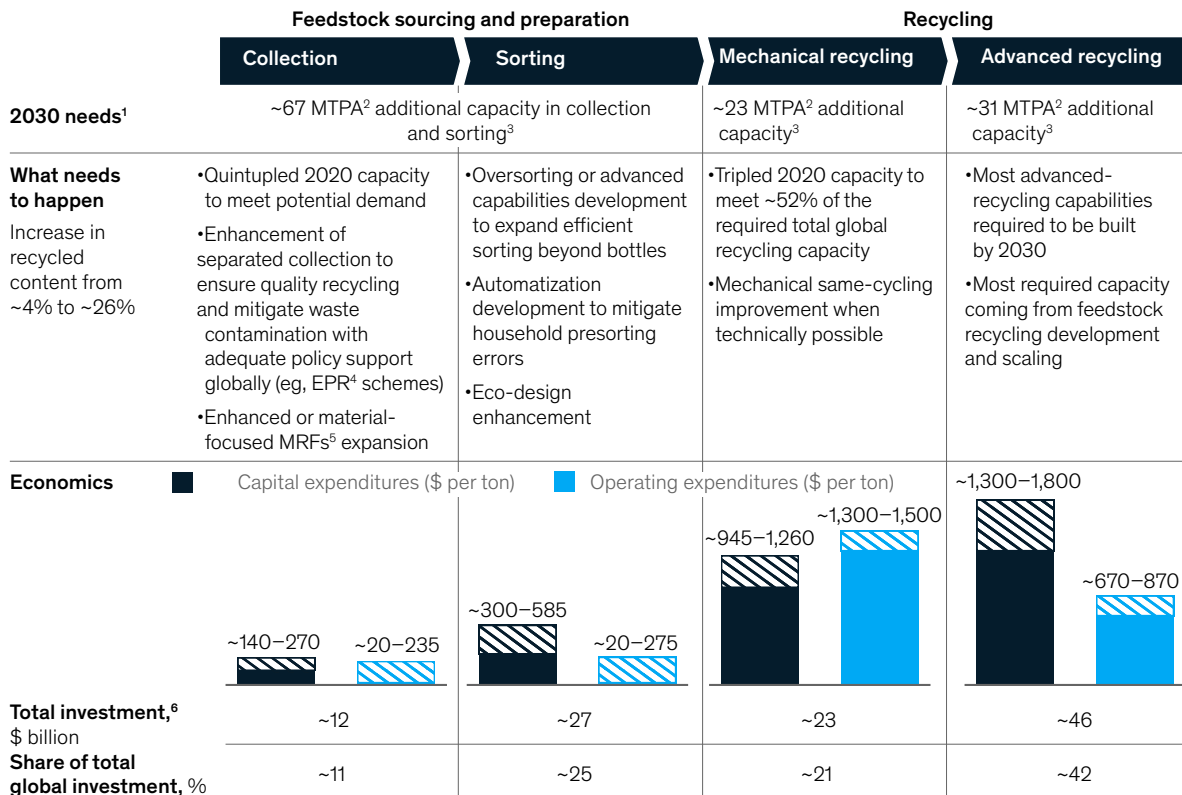
# A unique moment in time: Scaling plastics circularity

by Wenting Gao, Mikhail Kirilyuk, Rupa Ramamurthi, and Jeremy Wallach

The plastic recycling industry is on the verge of a transformation, following four to five years of sustained green premiums and attractive margins on the back of increased demand, changing regulations, and improved brand-owner commitments. More investment is necessary to ensure continued progress across the plastics value chain. McKinsey’s research shows that achieving 20 to 30 percent of recycled content for plastic packaging by 2030 globally could require \$100 billion of cumulative investment across collection, sortation, and both mechanical- and advanced-recycling technologies.

## Global demand for recycled plastics will likely require investment of about \$100 billion by 2030.

Global overview (packaging focus)



<sup>1</sup>Incremental needed capacity vs 2020.  
<sup>2</sup>Million metric tons per annum.  
<sup>3</sup>Input capacity.  
<sup>4</sup>Extended producer schemes.  
<sup>5</sup>Material recovery facilities.  
<sup>6</sup>Total capital expenditures needed by 2030.  
 Source: McKinsey’s CI Circular



Consumer Packaged Goods

# Cracking the growth code in the beauty market

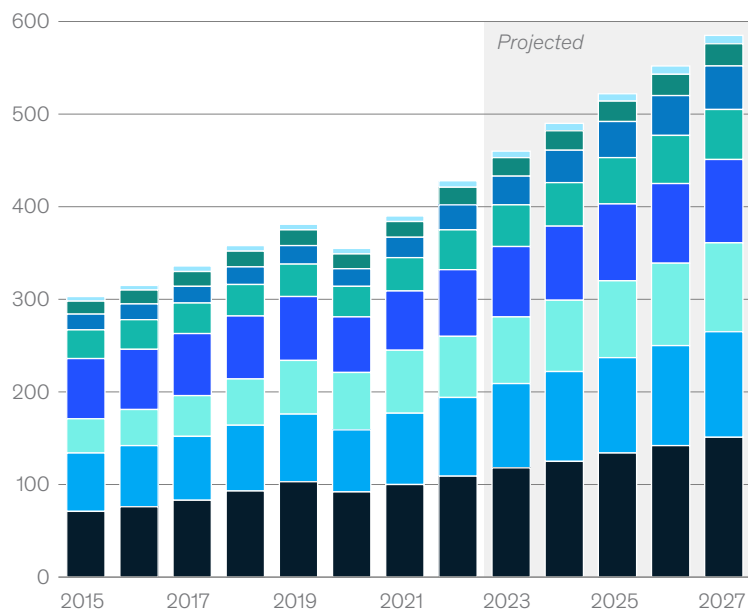
by Achim Berg, Sara Hudson, Kristi Klitsch Weaver, Megan Lesko Pacchia, and Imran Amed

Despite a turbulent macroeconomic environment, the beauty industry—defined as skin care, fragrance, makeup, and hair care—is still on an upward trajectory. Estimates suggest that the market could reach approximately \$580 billion by 2027. And China and the United States are on track to remain the world’s two largest beauty markets, reaching estimated sizes of \$96 billion and \$114 billion, respectively. To capitalize on the growth potential in these markets, brands will need to diversify geographically and tailor their strategies for each region.

© Anastasiia Krivenok/Getty Images

## Asia and North America are forecast to stay the two biggest beauty markets.

Global beauty market retail sales, by region, \$ billion



Year-over-year growth, %

	2015–19	2019–22	2022–27 projected
Total	6	4	6
Australasia	6	1	6
Eastern Europe	6	3	4
Africa and Middle East	5	11	12
Latin America	3	7	5
Western Europe	2	2	4
China	12	5	8
North America	4	5	6
Asia-Pacific <sup>1</sup>	10	2	7

<sup>1</sup>Excluding Australia, China, and New Zealand.  
Source: Euromonitor; McKinsey analysis; McKinsey Global Institute analysis



Education

# Higher ed is consolidating, transforming the sector

by Jake Bryant, Ryan Golden, and Ian Jefferson

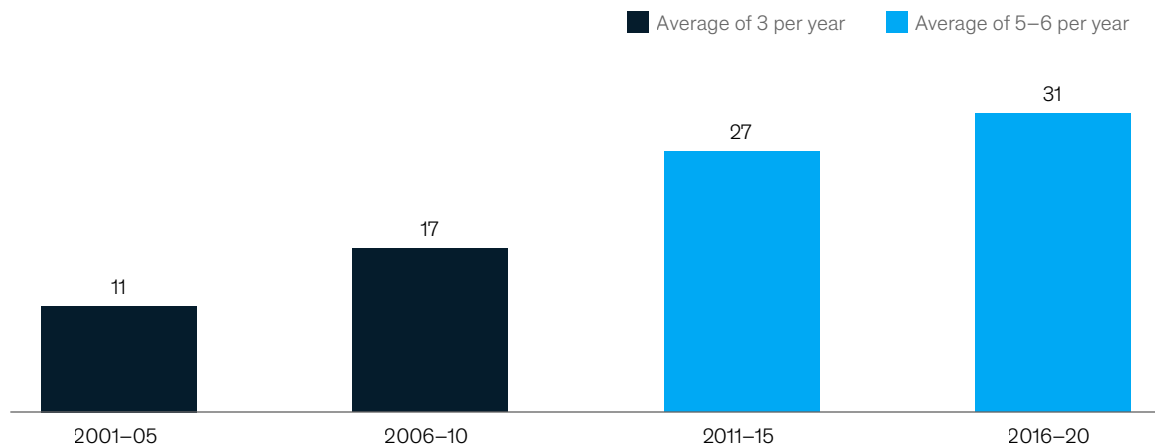
Higher education in the United States is facing enrollment challenges and financial strain. To address these challenges, a growing number of institutions are entering into partnerships, joint ventures, mergers and acquisitions, and other alliances. The number of M&A transactions in higher education increased threefold from 11 in 2001 to 2005 to 31 in 2016 to 2020. To ensure that these ventures deliver on their strategy and value creation objectives, institutions should get clear about both their starting positions and desired end states; assess and conduct due diligence on potential partners; and carefully plan and implement the infrastructure required to achieve near-term and longer-term goals postmerger.



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## M&A activity in higher education has almost doubled in recent years.

Number of mergers and acquisitions in higher education<sup>1</sup>



<sup>1</sup>Includes private and public (both not-for-profit and for-profit) 4-year higher-education institutions in US. Source: Ricardo Azziz et al., *Strategic Mergers in Higher Education*, Baltimore, MD: Johns Hopkins University Press, 2019; Integrated Postsecondary Education Data System



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Electric Power & Natural Gas

# Winning the M&A race for renewables developers

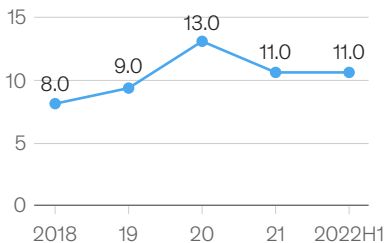
by Floris Busscher, Nadine Janecke, Florian Kühn, Boris Reznicek, Christina Schmidhuber, and Raffael Winter

Everyone wants to get in on the renewables trend: as global capacity of renewable-energy sources increases rapidly in the effort to decarbonize power generation, acquisitions of renewables developers are on the rise. There have been at least 175 global acquisitions of renewables developers since 2018. The average deal value and renewable developer multiples have also stayed high, despite market uncertainty. To create sustained value through such transactions, acquirers could create an M&A blueprint that denotes the major themes underlying their corporate or business unit strategy and provides criteria associated with those themes, as well as guidance for when screening potential targets.

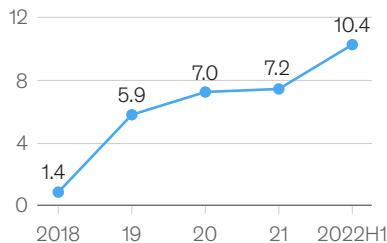
## Developers of global renewable-energy resources have increased their M&A activity in recent years even as multiples have stayed high.

Acquisitions of wind and solar developers<sup>1</sup>

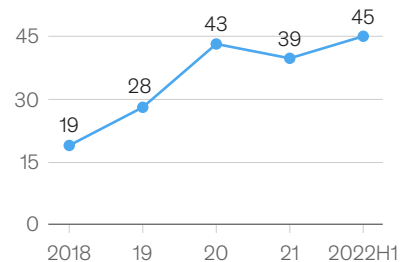
EV/EBITDA,<sup>2</sup>



Deal value, \$ billion<sup>3</sup>



Number of deals



<sup>1</sup>According to data from Dealogic, filtering for acquisitions of developers for wind or solar assets.

<sup>2</sup>Enterprise value to EBITDA multiple.

<sup>3</sup>Deal value disclosed for 47% of deals in 2018; 34% in 2019; 49% in 2020; 41% in 2021; and 60% in H1 2022.

Source: Dealogic

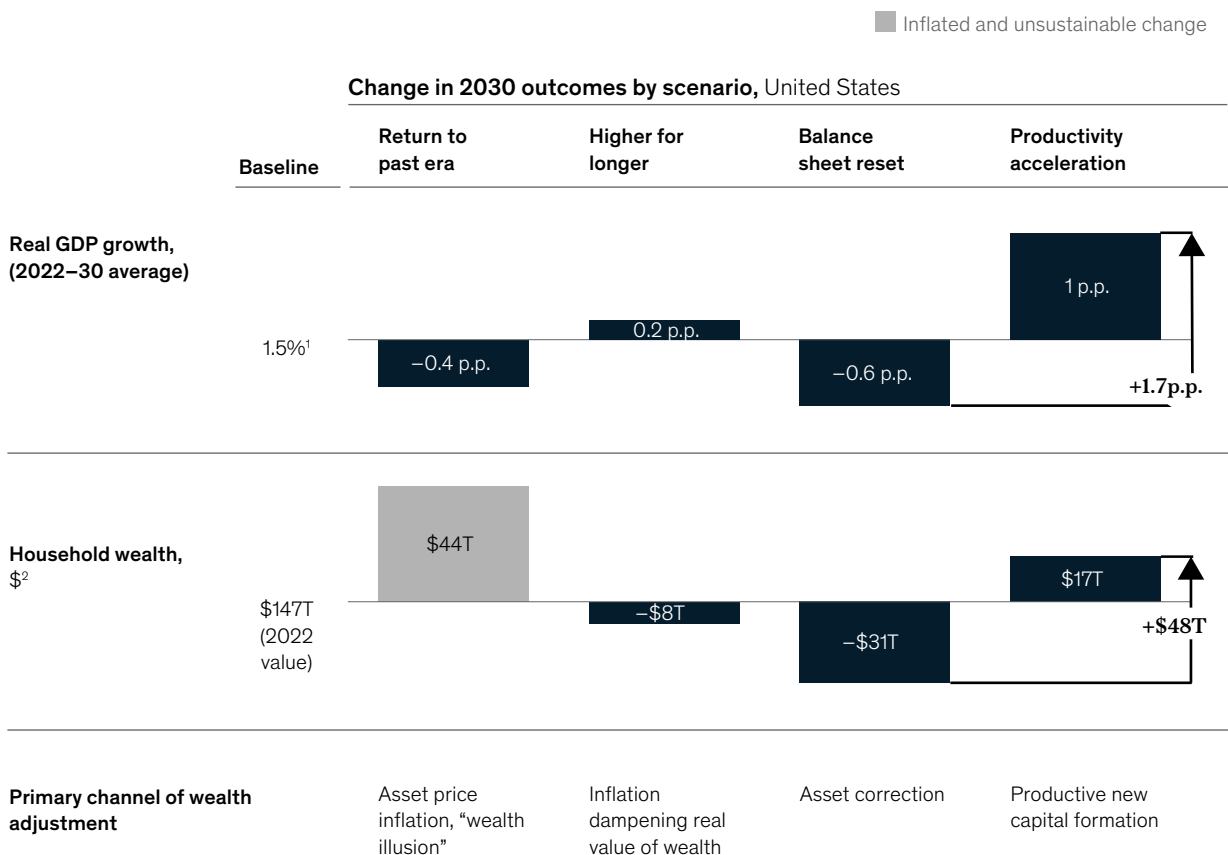
# The future of wealth and growth hangs in the balance

by Jan Mischke, Olivia White, Eckart Windhagen, Jonathan Woetzel, Michael Birshan, Sven Smit, Arvind Govindarajan, and Szabolcs Kemeny

Global economic instability, banking sector volatility, and geopolitical tensions are raising questions about the future of wealth and economic growth. The economic, banking, and investment landscape of the next ten years may look very different from that of the past 20 years. According to research conducted by the McKinsey Global Institute, there could be four potential scenarios in the future: return to a past era, higher for longer, a balance sheet reset, and productivity acceleration. And the impact of each scenario on the economic output and balance sheet for each country will differ. In the United States, for example, a balance sheet reset would lower annual growth by 1.7 percentage points, compared with an accelerated productivity scenario.

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## GDP growth varies by 1.7 percentage points and household wealth by \$48 trillion across scenarios in the United States.



<sup>1</sup>All figures in terms of 2022 dollars. Average forecasted growth over 2022–30 by Federal Reserve according to FOMC March 2023 projections.

<sup>2</sup>All figures in terms of 2022 dollars.

Source: Federal Reserve; MGI Global Balance Sheet (GBS) model; McKinsey Global Institute analysis



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Healthcare

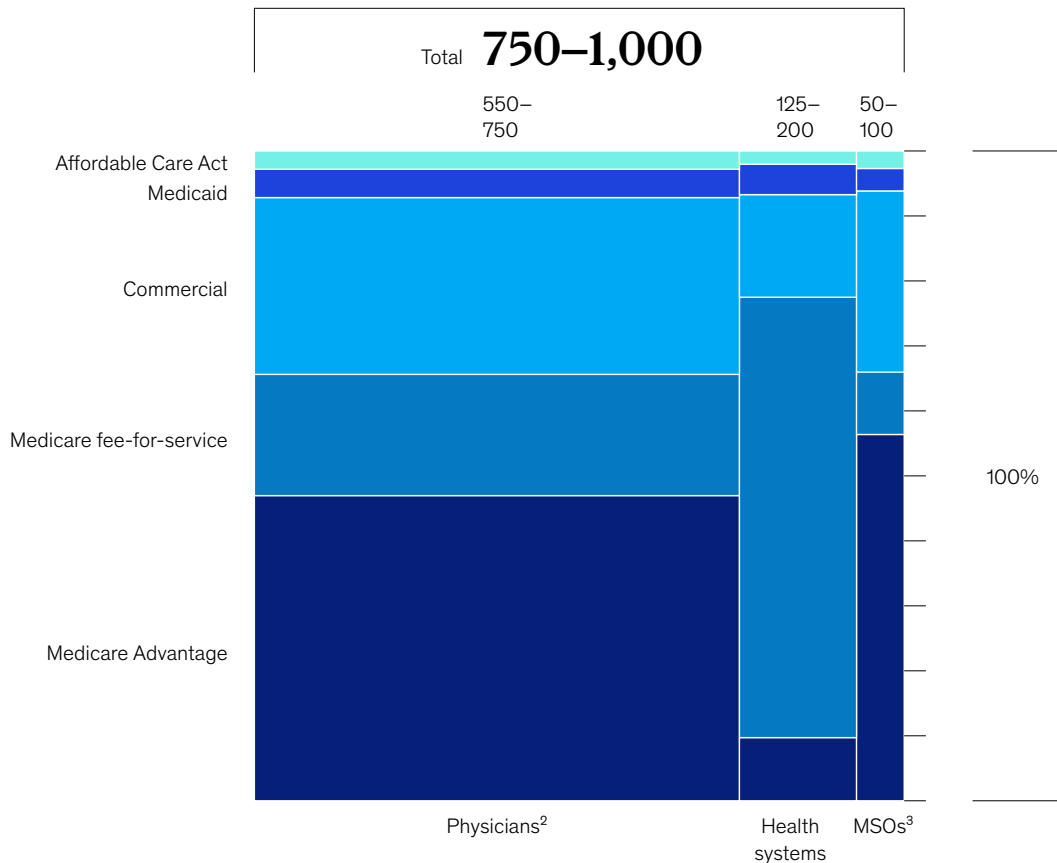
# Investing in the new era of value-based care

by Zahy Abou-Atme, Rob Alterman, Gunjan Khanna, and Edward Levine

Investors are increasingly interested in healthcare providers that specialize in value-based care. The flow of private capital to value-based-care companies grew more than fourfold from 2019 to 2021, while new hospital construction (a proxy for investment in legacy-care delivery models) held flat, according to estimates. If this momentum continues, McKinsey projects that value-based care could create \$1 trillion in aggregate enterprise value for payers, providers, and investors across all lines of business five years from now.

## Total valuations of value-based care assets could reach \$1 trillion.

2027 enterprise value of the margin from value-based care adoption,<sup>1</sup> \$ billion



<sup>1</sup>Assumes ~160 million lives in value-based care models accounting for \$1.6 trillion–1.7 trillion in medical spending, with medical-cost savings ranging from 3–20% based on level of risk, of which 50% is realized as profit margin with a 12–15x valuation multiple applied.

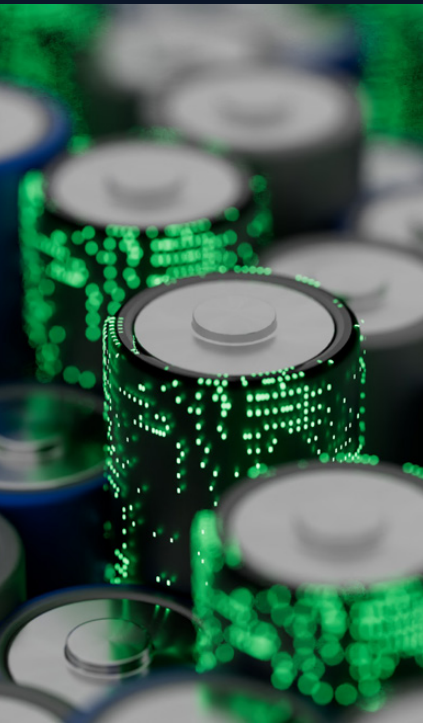
<sup>2</sup>Primary-care providers and specialty providers.

<sup>3</sup>Management services organizations and technology.

# Battery recycling takes the driver's seat

by *Andreas Breiter, Thomas Schuldt, Martin Linder, Giulia Siccardo, and Nikola Vekić*

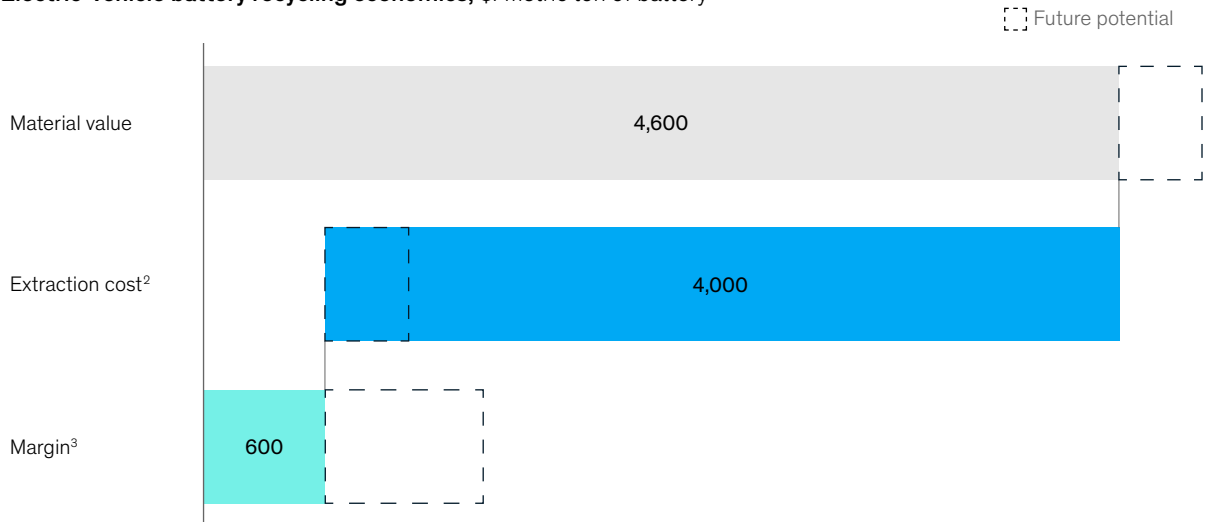
The rapid increase in electric mobility globally has put the spotlight on the market for battery recycling. Across the battery recycling value chain, from collection to metal recovery, revenues are expected to grow to more than \$95 billion a year by 2040 globally, predominantly driven by the price of the recovered metals, expected battery-cell-chemistry adoption, and regionalization of supply chains. The monetary value generated per metric ton of battery material could approach approximately \$600 by as early as 2025. Indeed, the growth and profitability of the EV battery recycling sector has the potential to make or break the pace of the vital transition from an internal-combustion world to an electric one.



© Just\_Super/Getty Images

**The monetary value generated per ton of battery recycling material could approach \$600 by 2025.**

Electric-vehicle battery recycling economics, \$/metric ton of battery<sup>1</sup>



<sup>1</sup>Based on mechanical pre-treatment and hydrometallurgical processing in a hub and spoke logistical set up. Indicative as of Q1 2023.

<sup>2</sup>Excluding costs of purchase for end-of-life (EOL) batteries (eg, NMC); considering closed-loop recycling (meaning every battery that reaches its 1st or 2nd EOL is being recycled); extraction cost for production scrap is on average ~20–25% lower.

<sup>3</sup>Average margin expected for a 55:45 share of nickel- or cobalt-based and nickel- or cobalt-free cathode chemistries on the market at 60–80% plant utilization; recovery rates ranging from 53 to 98% depending on metal; 10% margin for LFP batteries estimated, based on a cost-plus pricing model typically adopted in tolling; note that numbers are rounded.

Source: McKinsey Battery Insights





# Five ways biopharma companies can navigate the deal landscape

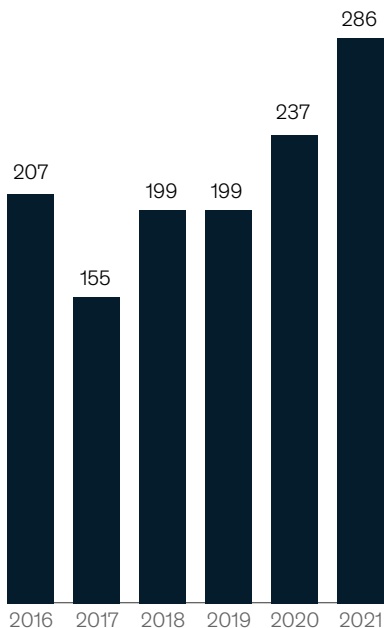
by Jan Ascher, Bihe Chen, Corina Curschellas, Anna Mattsson, and Ari Perl

The biopharma industry is witnessing an uptick in mergers, acquisitions, and other partnerships. The number of biopharma M&A deals increased to 286 in 2021 from 237 in the prior year, while deal value has held relatively stable since 2016 (except in 2019). The type of deals drawing investors' attention is also changing, such as more partnerships in therapeutic areas, deals focused on digital assets, and localized transactions around the globe, particularly in emerging markets. Companies that recognize the new opportunities in this dealmaking landscape and pursue them programmatically through a minimum of two small or midsize deals a year with a market capitalization of 20 to 30 percent can strengthen their portfolios with accelerated growth.

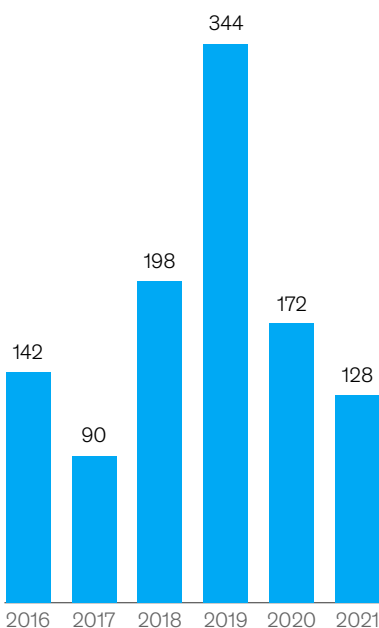
© tdub303/ Getty Images

## Biopharma mergers and acquisitions activity continues to increase, but so have other deal types.

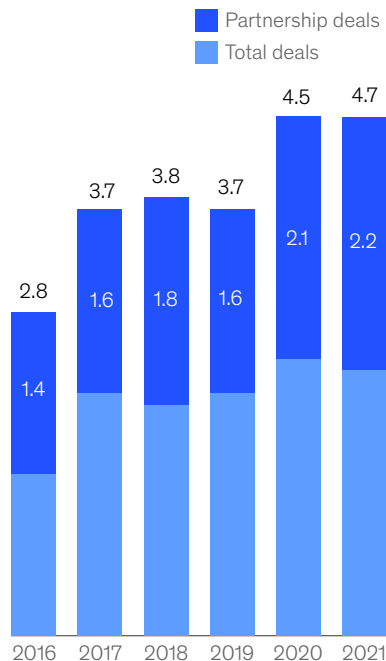
Number of biopharma M&A deals



Total biopharma M&A deal value, \$ billion



Number of biopharma deals by type, thousands



Source: McKinsey analysis of S&P Global Market Intelligence data (includes deals above \$25 million only)





# Maximizing synergies from oil and gas mergers

by Jeremy Brown, Tom Grace, and Steve Miller

A wave of consolidation is coming in the oil and gas sector, driven in part by record cash flows of exploration and production companies. The question now is how these companies will maximize value from M&A. Since 2016, deals greater than \$1 billion account for the largest portion of the total transaction volume in oil and gas—but many of these have struggled to create excess total return for shareholders. To boost the odds of success, companies could target operating and production synergies, in addition to focusing on general and administrative cost reductions.

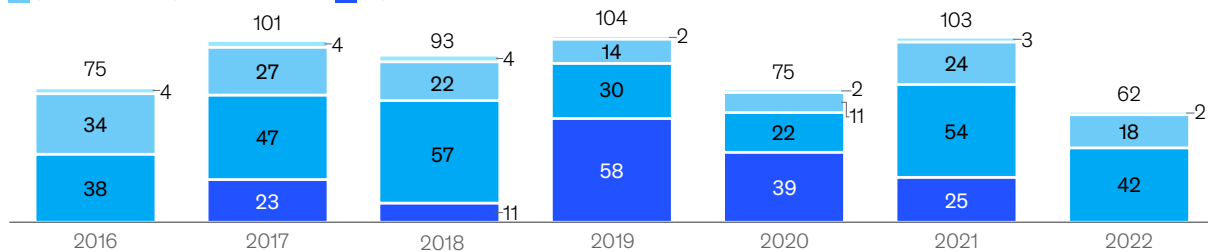
© ImagineGolf/Getty Images

**Although most deals were less than \$1 billion in size, deals greater than \$1 billion accounted for the largest portion of transaction value since 2016.**

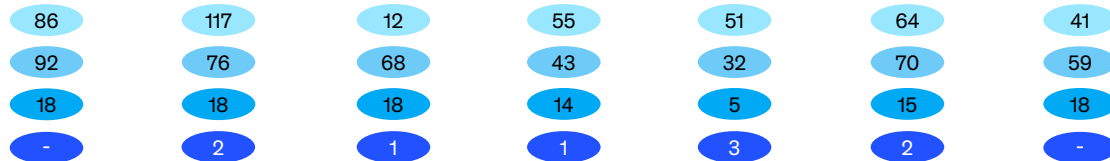
Global total upstream transaction value by deal size,<sup>1</sup> \$ billion

Deal size

■ \$10 million to \$100 million     ■ \$1 billion to \$10 billion  
■ \$100 million to \$1 billion     ■ > \$10 billion



Number of deals



<sup>1</sup>Includes global upstream transactions involving 100 percent ownership stake. Includes only exploration and production company transactions; excludes oil field service and equipment, drilling, midstream, or downstream transactions. Data as of January 2023. Source: S&P Global



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Retail

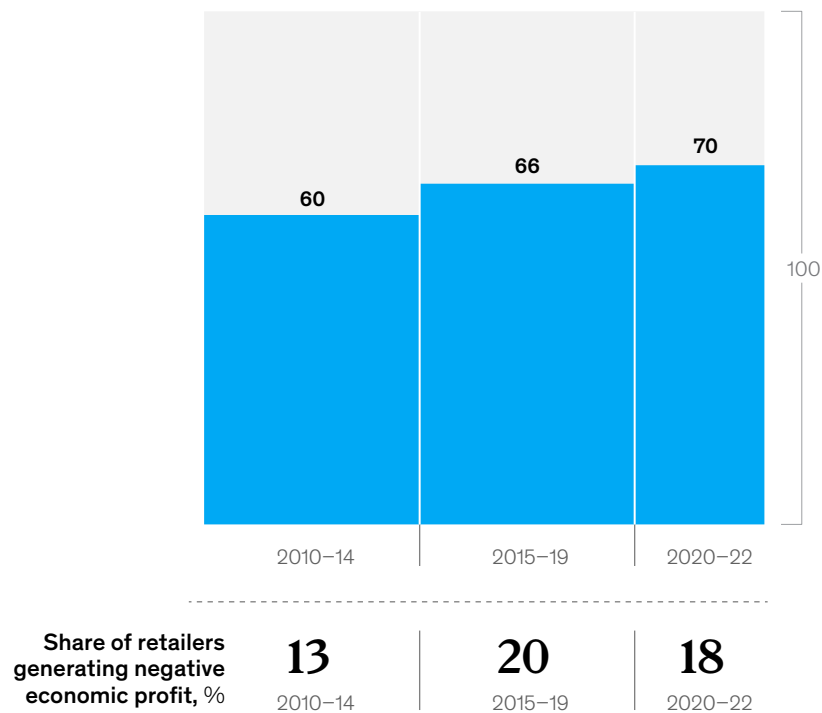
# Retail reset: A new playbook for retail leaders

by Steven Begley, Becca Coggins, Carson Green, Jad Hamdan, Dymfke Kuijpers, Franck Laizet

Retail is becoming a winner-take-most industry. Nearly one in five retailers have posted negative economic profit since 2015, according to McKinsey analyses. While the retail sector has created aggregate value through the years, the gap between winners and losers has widened: the top 10 percent of publicly traded retailers account for 70 percent of the sector's economic profit. To win in these disruptive times, when consumers are increasingly shopping across channels, showing little loyalty, and expecting fast shipping and sustainable products, retailers would do well to reexamine their focus areas and reinvent their relationships with customers.

**The top decile of retailers creates 70 percent of the value in the sector.**

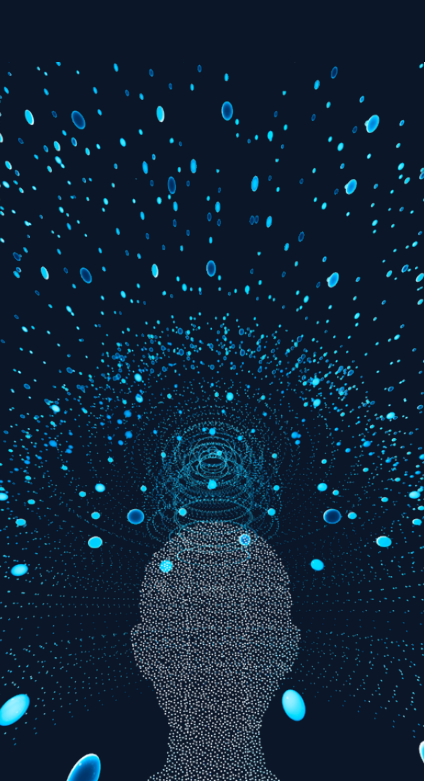
Share of sector economic profit created by top decile of retailers, %



# Technology trends to watch in 2023 and beyond

by Michael Chui, Mena Issler, Roger Roberts, Lareina Yee

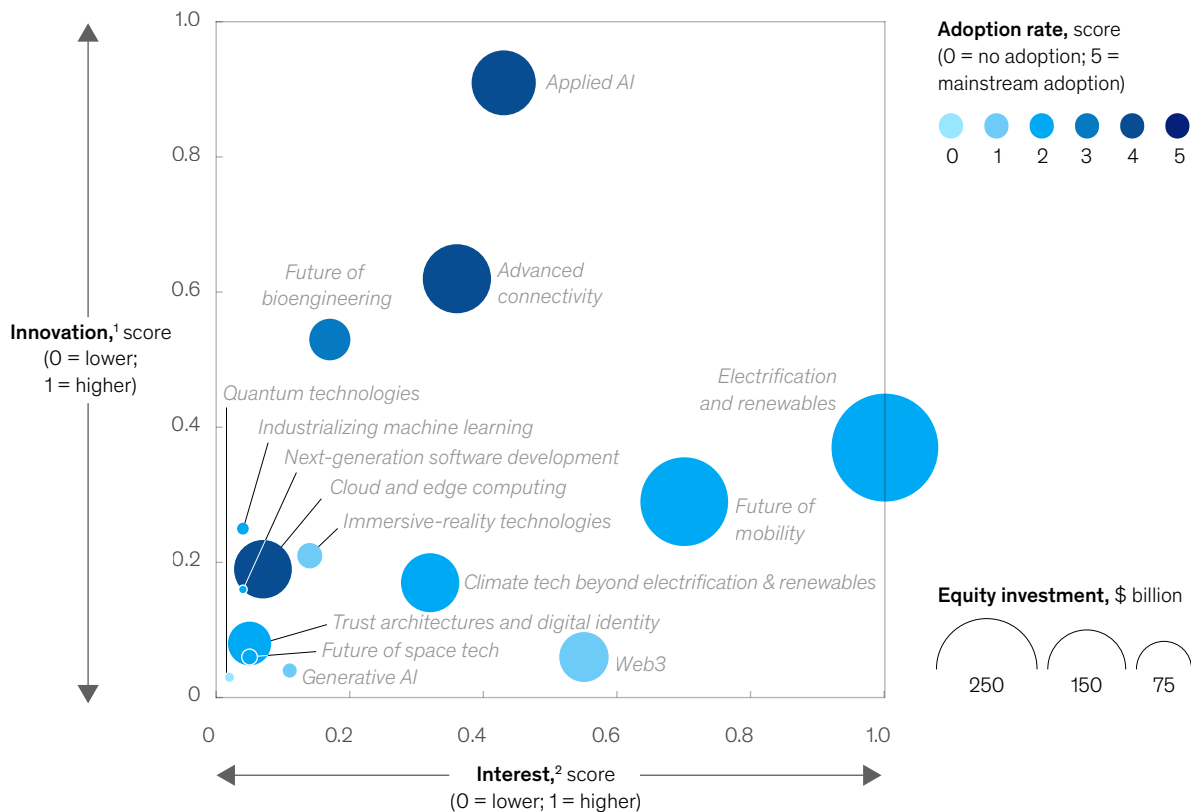
2023 has seen a resurgence of enthusiasm in technology’s potential to catalyze progress in business and society. According to research by the McKinsey Technology Council, many advanced technologies are on the forefront of innovation and garnering significant public interest and investment. Applied AI, for example, recorded the council’s highest innovation score and ranked in the top five investments among all 15 tech trends analyzed in this research. Meanwhile, there is also heightened interest and investment in mobility technologies (including electric vehicles and autonomous driving) as well as electrification and renewables (including solar-, wind-, and hydro-power and nuclear energy).



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**Of the 15 trends, some are experiencing accelerated innovation, investment and interest.**

**Innovation, interest, investment, and adoption, by technology trend, 2022**



Note: Innovation and interest scores for the 15 trends are relative to one another. All trends exhibit high levels of innovation and interest compared with other topics and are also attracting significant investment.

<sup>1</sup>The innovation score combines the 0–1 scores for patents and research, which are relative to the trends studied. The patents score is based on a measure of patent filings, and the research score is based on a measure of research publications.

<sup>2</sup>The interest score combines the 0–1 scores for news and searches, which are relative to the trends studied. The news score is based on a measure of news publications, and the searches score is based on a measure of search engine queries.



# Travel start-ups: Disruption from within

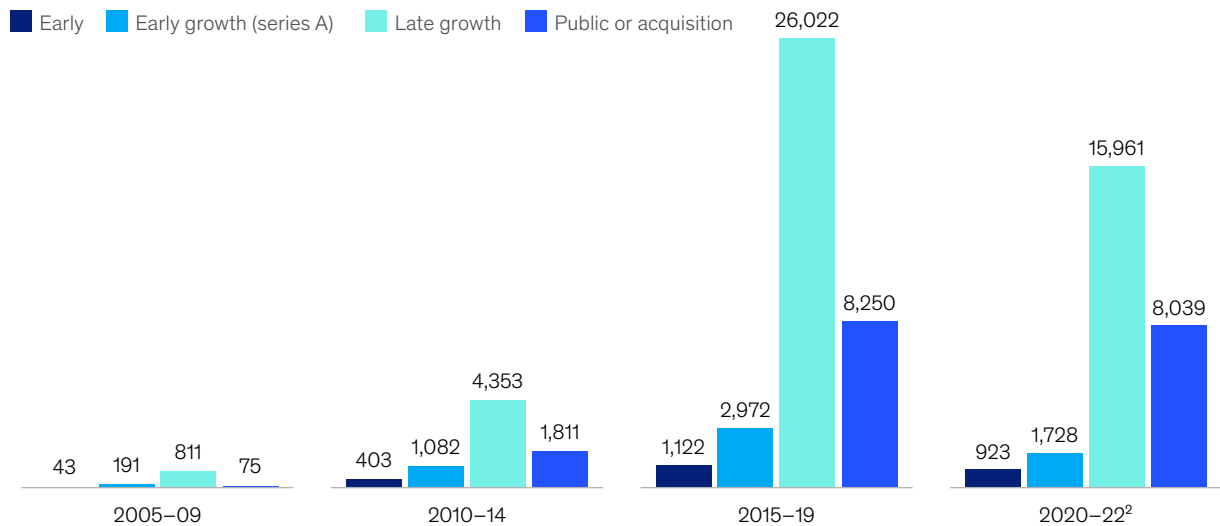
by Giuseppe Genovese, Evgeni Kochman, Vik Krishnan, and Nina Wittkamp

Investors are showing greater interest in travel start-ups, which could drive further innovation as well as development of technology and core processes in the industry. More than \$27 billion worth of investments were funneled into travel companies between 2020 and 2022. Average funding per round has also increased over the past decade, from \$4 million in 2010 to \$20 million in 2022. And investors are gravitating toward backing category leaders that have reached scale: the majority of funding across sectors went to companies in the late-growth stage over the past two years.

© Klaus Vedfelt/Getty Images

**Most funding is concentrated on growth rounds, with an increasing trend toward public and acquisition rounds.**

Historical investments in travel and tourism by round type,<sup>1</sup> \$ million



<sup>1</sup>Excluding convertible notes, undisclosed, corporate and non-equity assistance rounds.

<sup>2</sup>YTD: Data available until November 2022.

Source: Phocuswright

## Chapter 6

# Investing in sustainable, inclusive growth

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with Marie Lam-Frendo



# A guide to investing in Black economic mobility

Large segments of the Black population in the United States are underserved on a range of socioeconomic dimensions. Here's how impact investors can help close that gap.

*by Shelley Stewart III*





**Forty percent of Black American** households don't have high-speed, fixed broadband. That digital divide is just one of eight investment opportunities that, according to recent McKinsey research, have the highest potential to move the needle on Black economic mobility. The others are affordable housing, pre-K–12 education, health equity, financial inclusion, business ownership, workforce training and job attainment, and public infrastructure. In this interview, McKinsey senior partner Shelley Stewart III speaks with editorial director Roberta Fusaro about how impact investors can help close the digital divide, create more financial inclusion, and achieve equity in healthcare for Black Americans.

### Financial inclusion occlusion

**McKinsey:** Black economic mobility is why we're here today. Our recent report identified eight areas with the best potential to improve it while also offering investors favorable market returns. We don't have enough time to discuss all the areas, so today we'll focus on three: financial inclusion, health equity, and the digital divide. But before we get into all that—with the rise of impact investing, would you say now is a particularly opportune time to reach out to investors?

**Shelley Stewart:** I think that's right. What happened to the Black community and other underserved communities during the pandemic, as well as some of the social-justice movements in the wake of the murder of George Floyd and countless others, really brought this conversation of economic mobility into sharper focus for folks who may not have been spending as much time thinking about it. You see it proliferating throughout the economy, throughout sectors. You see it in the public sector, the social sector, and in the private sector, including the investment community.

**McKinsey:** I want to focus first on financial inclusion. There is an 80 percent wealth gap between Black and White Americans. What are the reasons for this disparity?

**Shelley Stewart:** Sometimes people assume that the lack of involvement in the financial-services

sector is just a symptom of a lack of resourcing in the Black community. It's important to think of it both as a symptom and as a cause. Many of the traditional barriers to Black Americans in the banking sector have led to a historical distrust, as a function of interactions over time, that includes being excluded or interactions that have been less than positive.

There is another point just about access, particularly in a kind of analog and brick-and-mortar world. There's this notion of banking deserts and not being proximate to actual branch banking. This creates an actual physical hurdle to convenience and access. And the other things I would cite are the products and the offerings. By virtue of having smaller incomes and lower or no starting wealth, some of the products are just cumbersome and not appropriate with the form factor today.

So it's just not working for swaths of the population. And that means that people are not saving. They're not able to access their checks in ways that are low cost, like direct deposit and then taking your money directly out of your bank. You don't have to go to a check-cashing place that might take a larger percentage of that to help you or bridge through a payday loan. That creates challenges, and that's where the private markets come into play.

### Financial impact investing

**McKinsey:** To that point, what can investors do? How can folks invest in a way that will make the greatest impact?

**Shelley Stewart:** I have a few thoughts about where the opportunities are. The first is about trust. The lack of trust in existing institutions creates a clear opportunity for new entrants, nonincumbents, to enter the arena and develop a compelling value proposition and loyalty.

The second point is about access. There's the brick-and-mortar point that I made, but as we think more about the role of digital, and the dramatic disruption that we're seeing within the financial-services sector, that creates real investment opportunities for people to develop platforms across banking,

credit products, and investing products that are easily accessible on someone's device.

And that creates private-capital opportunities for investors across a number of different areas. And you've seen capital flowing, particularly in the start-up realm, around some of these, but also in some later-stage companies.

And then the last point is, it's not just about access to products—it's also about how digital and some new and innovative ways of approaching things, like credit scoring, create opportunities for new products and services that didn't previously exist. How do we use this opportunity to develop offerings better suited for people with some of the income and wealth-starting constraints the Black population has?

### Thinking out of the box

**McKinsey:** Are there examples of the progress we're making in this area?

**Shelley Stewart:** Yes, I think there are. I think you're seeing more and more digital banks going after this underbanked or unbanked segment of the population. And if done well, the operating model allows you to have a fee structure that works better for this group because you don't have all of the fixed overhead and ongoing costs.

I think you've also seen on the investing side some apps that offer simple investing. I'm not talking about complex things. That's a story for another day, because I think there are a lot of changes that are also going on that are not appropriate. We're always mindful of that, particularly when you're talking about financial services, that there's this delicate balance between predatory and constructive.

But you've seen some stock investing in other apps that lower the barriers on whether you can buy one share or partial shares, and it doesn't cost that much to transact. So I think there's some innovation going on.

And then on the mortgage side, you've seen some innovative things from what I'll call nonincumbents—and even from some of the incumbents—like requiring

lower down payments and trying to get to this idea of, "How do I tailor the product so it's fit for purpose?"

I think you'll continue to see investment opportunities in and around that realm, whether it's mortgage products or even developing innovative ways to better assess credit. And if you can do that, and if you can price credit transparently, that's a business opportunity. And I think people recognize that, and you're starting to see capital flow.

### Not everyone has access to healthcare

**McKinsey:** Yes, the more success that you see in certain areas, with certain products, it sort of engenders more and more investment.

I want to switch to the health equity topic. Again, I'm looking at the report, looking at figures, and we see in those figures that roughly three million more Black Americans would be alive today if we had closed the disparities in healthcare between Black and White Americans. What are some of the reasons why these gaps exist?

**Shelley Stewart:** I think almost every discussion about economic mobility and disparity should start with health. If you don't have health at the foundation, then you can't really participate in the economy in a meaningful way.

There are a lot of systemic reasons for why we see some disparate outcomes for certain populations. I'll just give a few thoughts on some of the challenges that surfaced in a lot of the work that we look at. The first will sound familiar, but it's about access. And just like you have financial-service or banking deserts, you've got healthcare deserts.

Not being proximate to care is a challenge. People are living busy, busy lives. I think sometimes we conflate income with how hard people are working, and that's an incorrect conflation. You have people who are working two, three, and four jobs. So if access to care is not proximate in the context of them working many jobs and taking care of their families, then it is a real challenge.

The second one is a spillover from the labor market challenges that many Black Americans have, whether it be the sectors that they're employed in or the types of jobs they have, and what that means in a market where much of the insurance is a function of your job. That's the model that is largely in place. And if Black Americans are not participating the same way that other groups are in the workforce, and in jobs that actually confer these benefits, then they're going to be underinsured.

And that has huge implications for the type of care you get. It's a double whammy because the cost of healthcare when the need for it becomes acute—because you don't have the access to preventative care and because you're not insured—is higher.

If you combine the lack of access with the insurance coverage issues, and then you overlay what we know shows up as bias—you've seen some of the recent stories about the mortality rates of Black women who are pregnant compared with other segments of the population, even when you adjust for education level, and it's staggering. If you take those things all together, that presents a real challenge, but it also presents a real opportunity.

### **Addressing inequities in healthcare**

**McKinsey:** I think there was something also in the report that talked about how healthcare providers were prescribing pain medication differently based on their own racial bias. How can investors help move the needle in this regard?

**Shelley Stewart:** The investor community alone won't solve this one, but that's the spirit of this whole discussion. It's going to take the private sector, private capital, social sector, and public sector coming together. I do think there are a few opportunities here. One of the big social determinants of health outcomes, way upstream, is food and nutrition. When people think about health, they don't always go there, but this is a place where we should start.

We know that if you're Black, you're significantly more likely to live in a food desert, which is a USDA-designated census tract that does not have what is

deemed to be adequate access to fresh food. So how do we think about investing in these communities in the food supply chain, if you will, to bring healthier and better alternatives to these communities? And by the way, we spent a long time surveying thousands of Black consumers. Their preferences for healthy, organic foods are stronger than other consumers, on average.

The demand is there. So how do we find ways to invest in businesses and business models that can bring that healthy and nutritious food to these communities? That's one idea. I think a second one, as we think about our healthcare system broadly, is how are we investing in ensuring that when you do things like develop molecules and drugs, or when you're training physicians and caregivers, how do we make sure that we are injecting this idea of diversity of patients all throughout that journey? And I think that represents an opportunity for investors who ask, "What are the business models, and training programs, and things that we can overlay inside of the system to help accomplish that?"

Even more extreme, if you think about life sciences companies that develop molecules and drugs, one opportunity for exploration that we've talked about is there are certain drugs and conditions that are more prevalent in Black populations.

That's an opportunity to go nurture some drug or molecule that might be underinvested in if you took a more generic or broader lens. How are we finding these niche opportunities to capitalize things that will disproportionately help certain communities that have maybe been undersupported in the past?

That's the second thing I would say. And the third thing is, we start to merge the digital concept with the health to get to digital health. And that helps to bridge some of the access gaps that we've been discussing, right?

Also, how do we invest in digital capabilities to get to people in a different way, to help bridge some of those legacy issues, and at the same time invest in brick and mortar in these communities, from a health-provider perspective?

You've seen some models pop up, some of these smaller-format, fully integrated internal medicine or specialist health options. And they're starting to show up more and more, particularly in urban markets. I truly believe that's an investment opportunity, and you've seen some of them be incredibly successful.

### **The digital divide**

**McKinsey:** Shelley, you're doing my work by leading us into this next section on the digital divide. One of the areas where we see a significant lack of access is high-speed, fixed broadband. Looking at one of the statistics from the report, approximately 40 percent of Black American households, as opposed to 28 percent of White American households, don't have high-speed, fixed broadband. What's preventing Black Americans from gaining this access?

**Shelley Stewart:** I think about broadband infrastructure in general as an enabler to address a lot of the other challenges, and I think there's been a sharp focus on this recently. The administration in Washington has talked a lot about this issue. There are a number of noted philanthropists who have identified this as a core issue and a passion of theirs to address.

At the core, there are a few challenges, and they differ by type of geography. One is the physical infrastructure itself. Also, you need real capital in the ground if you're going to unlock it for folks. There's capital showing up with some of the recent bills that have been passed. And how do we make

sure that capital gets to the places where it's needed most? And are the services affordable? Can folks consume those services in a way that is not overly burdensome relative to rent and the basic necessities of living? This is an opportunity but also another cost bucket.

The third piece is, once you've got [the services], then what device do you need to consume the whatever it is you're trying to do, whether it unlocks not just financial services and healthcare but also educational opportunities? Do you have a device, a tablet, a computer that really allows you to engage beyond just your iPhone? And by the way, phones are great, but that form factor is not necessarily always conducive to all of the great use cases that we have to leverage digital for a real enabler for education, health, and financial services. So we also have to address the devices issue that sometimes gets lost in this discussion.

### **Where should impact investors start?**

**McKinsey:** This report sets out a road map for investors and says, "Here are the eight highest-potential areas." How can investors prioritize?

**Shelley Stewart:** We don't have all the answers, and by no means is the research piece meant to be an exhaustive guide. It's meant to be a starting point for where we have identified existing sustainable business models and marry that to where we've identified interventions that we know will improve outcomes for people.

**'If you don't have health at the foundation, then you can't really participate in the economy in a meaningful way.'**

—Shelley Stewart

Those are the areas we identify as investors start to think, “How do we operationalize that?” What are the issues and areas that you’re most passionate about driving different outcomes? And then, how does that lead you down the road to, say, “I’m going to focus on the digital divide, or I’m going to focus on affordable housing, or I’m going to focus on banking.”

I think it really is trying to marry that view with your core competencies and your professional networks, or even maybe where you think your limited partners, the folks that are providing the capital to you, where they may have interests. Part of this is also to skate to where the puck is going.

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What our aspiration is in putting this out is that we will learn from the field. We hope that there’ll be five, ten, 15 more business models that emerge in each of these eight areas that are sustainable and that do good along the way. That’s really the hope.

**McKinsey:** Shelley, this has been a great discussion. And we’ve only just touched the surface. Let me remind everyone that they can visit us at [McKinsey.com](https://www.mckinsey.com) to get the full report, *A guide to impact investing in Black economic mobility*. Shelley, thanks so much for joining us today.

**Shelley Stewart:** Thank you very much for having me.



# Mitigating climate change with venture capital: A conversation with Wavemaker Impact's Steve Melhuish

The founding partner of a Southeast Asian venture capital fund explains his company's global ambitions to create economic opportunity, promote sustainability, and reduce carbon emissions.

*by Tomas Laboutka*





**Human activity began altering the climate** in the mid-19th century, when the industrial revolution began unleashing unprecedented amounts of carbon into the atmosphere. But an innovative new venture capital (VC) climate tech venture builder is trying to mitigate some of the ensuing catastrophic climate change with a laudable and lofty goal: reducing 10 percent of global carbon emissions by 2035. Wavemaker Impact plans to reach this goal by funding what it calls 100x100 companies, sustainability start-ups able to mitigate 100 metric megatons of emissions in ten years while generating \$100 million in revenue. In this interview, Wavemaker Impact founding partner Steve Melhuish and McKinsey's Tomas Laboutka discuss the genesis of the venture, why it chose Southeast Asia as the first of 15 global hubs, and why business model innovation is sometimes more important than technological innovation.

**McKinsey:** Today, we share a conversation with Steve Melhuish. Steve is an entrepreneur who has built companies in Europe and Asia and is cofounder of PropertyGuru, a property technology unicorn listed on the New York Stock Exchange. Over the past four years, Steve has focused on climate and social impact, investing in and helping over 25 green-tech start-ups. He also cofounded Wavemaker Impact, a climate tech venture build fund, which is cofounding and building a portfolio of 100x100 companies, each with the potential to generate \$100 million in revenue and abate 100 megatons of greenhouse gas emissions over a ten-year period. Steve, great to have you here.

**Steve Melhuish:** Great to be here. Thanks for having me.

**McKinsey:** Let me jump in straight away. Why does climate sustainability matter from an investor's perspective, and when do you expect we'll move past all the greenwashing and see a fundamental shift to differentiation and real value capture?

**Steve Melhuish:** I think we're already seeing it. Clearly, there are some elements of the industry where greenwashing is still rife. But the businesses I see investing in the region are fast-growing, delivering not only sustainable outcomes but also

profitable economic outcomes. We're seeing VC players moving into that space, as well as established climate and sustainability investors.

It feels like in the past 12 months or so, the economy has finally woken up to this green transition and the investment that's going to be required to support it. In Southeast Asia alone, it will require a \$2.7 trillion investment, so I'm seeing a move in the right direction.

**McKinsey:** That's really encouraging, and congratulations for the portfolio being able to raise funds in this climate.

**Steve Melhuish:** Everyone talks about the so-called funding winter, but we haven't seen evidence of that yet. Investors seem to be increasingly focused on the sustainability space, which is encouraging.

**McKinsey:** What does that look like in this region? There's a disproportionate correlation between the impact of the climate crisis and how much money we've historically seen going into Southeast Asia. We both know how many cities are predicted to be under water by 2030 or 2050, and yet, the percentage of the capital allocation is not matching the requirements. How are the tides shifting in Southeast Asia?

**Steve Melhuish:** The region where we operate here in Southeast Asia is home to about 600 million people. You've got population growth, you've got urbanization taking place, and you've got lots of people getting electricity, air conditioning, and two-, three-, or four-wheeled motorized vehicles for the first time.

You also see a large increase in emissions per head, particularly in emerging markets, moving from about two tons per head to a more developed-economy level of ten tons per head. That all adds up to this double whammy taking place in a region that's home to about a third of global carbon sinks, like rainforests, which are being rapidly depleted.

So we have an urgent need to reduce emissions. In Europe, you have this very strong regulatory pressure from the top down and a very strong consumer pressure from the bottom up. In the United States, you have a very strong capital movement into this

space, but in Southeast Asia, we're still at day one. What you do in that case is focus less on talking about climate change and sustainability to investors and more about the value of delivering from an economic point of view.

The businesses we and others are investing in are delivering material economic impact to their customers. It's the inverse of the green premium. This is a green discount. This is delivering economic value while either increasing revenue or reducing cost, improving the bottom line, or sometimes both. And without achieving that material economic benefit, we're not going to get adoption.

The challenge, and therefore the opportunity, for investors and companies in this space is, if you're addressing and delivering a strong economic benefit to your customers—which just happens to result in lower emissions—then you're going to get faster adoption. And that's how companies in the region are predominantly approaching the problem.

**McKinsey:** This is a very interesting approach. You're getting ahead of the policies and consumer adoption and driving with value first. You're building real businesses that are delivering clear value to the target customers or, in the case of B2B, their partners. And for the cherry on top, they also are solving a real problem with the climate crisis and any other sustainability issue.

**Steve Melhuish:** Absolutely. If you think about it, a lot of the climate tech investing is going into moonshots and big science and engineering projects that will require large-scale infrastructure, whether it's carbon-capture technologies, hydrogen, or new nuclear science. It will take decades to roll out and scale some of these brand-new transformational technologies.

What do you do in the meantime? You have all the technology you need to reduce emissions by 50 percent already. The challenge is figuring out why some of these technologies are not being adopted. And that boils down to the business model and understanding the pain points of customers. If you've got a cleaner and cheaper alternative, then adoption should happen.

We spend a lot of time trying to validate opportunities where we can deliver these economic benefits using existing technology. It's more about business model innovation. If you approach a farmer who's earning \$100 and say, "We can deliver something that is not only cleaner for you but will also deliver 30 to 50 percent extra income," that accelerates adoption.

**McKinsey:** Quite fascinating—business model innovation instead of tech innovation. You have invested in over 25 angel rounds for sustainability and climate-combating companies. Then you said, "I want to scale this. I want to pursue this vision to drive business model innovation with a clear purpose." Can you share a bit more about the philosophy behind that?

**Steve Melhuish:** We started Wavemaker Impact about 15 months ago. The ambition for Wavemaker Impact is to mitigate 10 percent of global greenhouse gas emissions by 2035. It's a very ambitious goal. To put things in perspective, Singapore alone is going to be peaking at around 50 to 60 megatons, so the goal is about a hundred times a Singapore, which is not a trivial amount.

We're starting in Southeast Asia and focusing on building what we call 100x100 companies. A 100x100 company is a company or venture we believe can mitigate 100 megatons of emissions, typically over a ten-year period, and generate \$100 million in revenue. If we can build 50 of these companies, we will achieve the goal of five gigatons.

We plan to do this across 15 different hubs, the first of which is Southeast Asia. The reason we started in Southeast Asia is it's one of the fastest-growing regions in terms of climate change. It's also massively underserved and only attracts about 2 percent of the total climate tech funding today. So there's a huge underserved opportunity to build some of these companies and get them rolled out and scaling across the region rapidly.

Within the first 15 months, we're now on to our sixth venture. Not surprisingly, given the emissions map of Southeast Asia—where 50 percent of the emissions come from food, agriculture, and land use—five of the six ventures are in that space, while one is in the renewable energy space. The plan is to get to 16 or 17 before we move on to the next region, and eventually build out to 15 hubs and ultimately get to 50 of these companies delivering 100x100 at scale.

**McKinsey:** Wow, you're talking about moonshots in a different and very pragmatic way. This is actually a fairly ambitious but also a very clear plan on how you're trying to tackle various operational targets by 2035. What's quite interesting is that you're ultimately doing venture building at scale, which quite a lot of our audience is very curious about. In terms of tapping into this new business model innovation, you have a bunch of ideas you're investing in that will hopefully reach product-market fit. How do you go beyond scaling and actively help the portfolio move beyond that?

**Steve Melhuish:** That's a really good question. The approach we take is to first go where the emissions are, and if we want to have a big impact, we need to be going after a large amount of carbon. When we think about an addressable market, we think about it from a two-lens perspective—the usual economic opportunity perspective and the carbon impact perspective.

We identified about 50 areas just in Southeast Asia where we believe we could build 100x100 companies. One example is methane from rice production, which generates about 700 megatons of CO<sub>2</sub> equivalent, making it the third-largest generator of methane in Southeast Asia. We've identified it as a potential carbon opportunity, but we obviously have to determine whether we can build an economic and highly scalable business. That's the process we're going through now, running some experiments and seeing what works in different markets such as Indonesia, Vietnam, or India. We spend a lot of time thinking about validation.

We typically identify experienced entrepreneurs who have already built one, two, or three companies. They've got the battle scars, know how to scale

companies, and know how to do fundraising. They also know how to build organizations from one to a few hundred people, and how to grow from one market to multiple markets. What they don't know, and what they want help with, is identifying the biggest and best sustainability or climate opportunity to focus their efforts on.

We then assign a team of three people and work with the entrepreneur for five to six months, testing and validating the area and opportunity and speaking with 100 to 200 customers to see whether this could become a 100x100 company. By the end of that process, we've got a minimum viable product and letters of intent or memorandums of understanding from customers willing to spend money on this solution when it becomes commercially available. Only at that point do we actually put money in.

We try to accelerate and derisk the opportunity by spending five to six months just validating. And once we've decided to invest, we'll typically put in \$650,000 as pre-seed money. Then we work intensively for the next 18 months to help scale that company, working very closely with the founders. The founders own a large percentage of the business, typically 70 percent or more of the company, so they're highly motivated to build.

That's a little bit different from how a corporate venture would work, but these should be venture-backable companies that normal VCs or climate tech investors will invest in during that first 18 months of scaling. For all intents and purposes, they will look like normal venture companies. For example, the first one we invested in and started building is approaching 2,000 farmers, is already on track for about \$4 million in revenue, and is looking at \$10 million in revenue next year. That's not bad for a two-year-old business. We continue to refine and polish our model, but that's the approach we're taking.

Unlike a more traditional VC who looks at deal flow from an investment point of view, we look at deal flow through a number of lenses. First, can we identify these 100x100 company opportunities? We also look at deal flow in terms of founders and spend a lot of time talking to founders and building relationships with them. In many cases, they're exiting their companies on an earn-

out or thinking about what's next. So we continue those conversations until they're ready to dive in.

This year, we'll do six ventures, and probably another six ventures next year. It's not high-volume "spray and pray." It's very much a deliberate approach, with one entrepreneur and three venture builders working together intensely for those first six months.

**McKinsey:** That is a lot to unpack, and you shared some incredible nuggets. Let me try to summarize what I heard. One, you do quite a bit of legwork, so this is not a VC with a passive funnel. You're actually creating the opportunities with heavy research, derisking the investment, and working with the founders. If they're getting across the line, they get support from you for the next 18 months, and off they go to scale. These companies have to be fundable, and you give sufficient incentives to the founders. So you're derisking and encouraging experienced entrepreneurs to participate with a significant upside—very interesting from a venture-building perspective.

I want to go deeper into this funnel you touched on. You're looking for serial entrepreneurs who know what they're doing but may not be clear on what to do in the climate space. Can you summarize some of the lessons learned in attracting this distinctly unique talent?

**Steve Melhuish:** It was my single biggest concern when we started this 15 months ago. We had a supposition that there are enough opportunities to build these 100x100 companies, which we verified. We also assumed investors would be interested, because it's quite a new space. It's climate tech, it's Southeast Asia, it's venture building, and it's effectively a first-time fund. But we're now double over our initial target and are going to close ahead of that. So investor appetite has been very strong.

But are there sufficient experienced founders in the region who have built and exited companies? When you look at the data, there are roughly 150 exits a year in Southeast Asia. Of course, not all are successful. But there are an increasing number of founders who have relocated or built their businesses in Southeast Asia, maybe from Europe or the United States or farther afield. On our first call for entrepreneurs, we

had about 200 founders apply, and we chose one. The second time, we had around 160, and again, we chose one.

We've been leveraging not only our networks but also the portfolios' networks for suggestions. We've been holding events in Indonesia, Vietnam, the Philippines, and other markets as well, just to raise the flag and share a little bit more about Wavemaker Impact. So it's not been an area we've struggled with, and we have met some super-talented people.

Sometimes the timing doesn't work, because they're in the process of exiting, or there's an earn-out, or they want to take a little bit of time off before diving straight back in again. It's not like you're hiring someone for a job right now. We might be speaking to somebody today who we're keeping warm for the end of next year, because they may just not be ready or they may just want to take some time off.

We are increasingly widening the net in terms of both geography and encouraging more women founders in this space, because that's been one area of surprise. When I first started looking at sustainability four or five years ago, I was surprised to see there were so many women leaders, like chief sustainability officers or sustainability managers. But when it came to tech and start-ups, it was still very heavily male-dominated. So we're doing work around how to encourage more women to move into this space, holding events and collaborating with other organizations.

**McKinsey:** This is very commendable, and again, so many nuggets to unpack. It almost sounds like you're building product–talent fit within your own venture, tapping into multiple ways to find talent. You have events, you're looking into your own portfolio, and you're trying to increase the pie by attempting to bring in more female founders. Then you're thinking about the long run by creating what I imagine is basically a backlog of founders. You're trying to hit that product talent fit, so to speak, and it sounds like you're getting there.

**Steve Melhuish:** Hopefully, yes. I think we're constantly learning and building that pipeline. The team is now 15 people, and many of those have

joined us from other venture builders or management consultancies or are founders in their own right. But in many, if not the majority of, cases, they've joined us with a bit of a salary cut and are highly mission-aligned, because they want to make a difference in this space. I'm optimistic, given the response we're seeing. I feel like we're on the cusp of this green transition and people wanting to play a role in making the world a better place.

**McKinsey:** Congratulations, Steve. It's been tremendously insightful and inspiring to hear all the lessons you've learned building this new venture,

from the aspiration, the ROI, and moving from greenwashing to value capture right away. Then there's the focus on Southeast Asia, where you can carve out a unique position, all the creative opportunities, the specific and practical tips on building a large pipeline of ideas to invest in, and how you're finding the right entrepreneurial talent. It's been a real pleasure to have you on the show.

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# Climate investing: Continuing breakout growth through uncertain times

Investments in climate technology are still increasing, defying the headwinds that affected most capital markets. We identify eight factors for deploying capital in this resilient space.

*This article is a collaborative effort by Fredrik Dahlqvist, Sean Kane, Lisa Leinert, Maximilian Moosburger, and Anders Rasmussen, representing views from McKinsey's Global Energy and Materials, Private Equity and Principal Investors, and Sustainability Practices.*





**Climate-related investment** increased significantly in 2022, defying the considerable geopolitical and macroeconomic headwinds that roiled most global capital markets. Due in part to the policies of the United States and Europe aimed at zeroing out emissions by 2050, that growth seems on track to continue this year, even though the global economic context remains challenging. In this article, we outline a framework that could allow investors to succeed in this turbulent environment by ensuring that investment targets are not only well positioned to leverage a wide range of climate tailwinds but are also able to deliver on critical business fundamentals. We offer a review of climate-investing trends in the face of recent market volatility and identify eight factors that investors and leaders can consider when looking to deploy capital productively.

In 2022, Russia's invasion of Ukraine, the resulting energy crisis in Europe, turmoil in the global economy, and a slowdown in markets all generated concern that a three-year period of growth in climate technology investment was ending.<sup>1</sup> That downturn hasn't materialized, as measured by investment in the area. Instead, climate-related private-market investment far outpaced the broader market in 2022 as measured by deal activity, the amount of capital deployed, and capital flows into dedicated funds.

The momentum seems poised to continue in 2023 as governments, corporations, and investors increasingly accelerate the deployment of climate technologies, which offer the potential to promote energy security, affordability, and sustainability objectives. European nations, for example, are speeding up their long-term plans for local renewables, even as many seek to offset cuts in Russian energy imports by boosting supplies of gas, coal, and oil in the shorter term.<sup>2</sup>

Climate technology is getting a further boost from unprecedented government programs in the United States and Europe that will unleash a flood of capital to meet the challenge of achieving net-zero emission commitments by 2050. The US Inflation Reduction Act (IRA), passed last year, allocates more than \$370 billion in funding to mitigate climate change, while the EU Green Deal could potentially dedicate more than €1 trillion in public and private funds to the fight. Together, these measures may open up more opportunities for investors in a market that McKinsey estimates could reach \$9 trillion to \$12 trillion in annual investment by 2030.

### **Breakout growth**

Climate investing experienced a period of breakout growth in capital formation over the past four years. From 2019 until the end of 2022, private-market

## **Climate-related private-market investment far outpaced the broader market in 2022 as measured by deal activity, the amount of capital deployed, and capital flows into dedicated funds.**

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<sup>1</sup> "UN chief warns against 'sleepwalking to climate catastrophe,'" UN News, March 21, 2022.

<sup>2</sup> "The energy transition: A region-by-region agenda for near-term action," McKinsey, December 15, 2022.

equity investors launched more than 330 new sustainability; environmental, social, and governance (ESG); and impact funds. The cumulative assets under management in these funds grew threefold, from \$90 billion to more than \$270 billion (Exhibit 1). Furthermore, those figures do not include the significant amount of capital earmarked for climate opportunities in corporate capital budgets, public-equity investment vehicles, and credit funds.

Climate-focused capital has been deployed rapidly. The global volume of climate-oriented equity transactions in private markets—equity investments, from pre-seed to buyout, in energy transition technologies and other climate solutions—increased more than 2.5 times, from about \$75 billion in 2019 to about \$196 billion in 2022, according to PitchBook, a database of

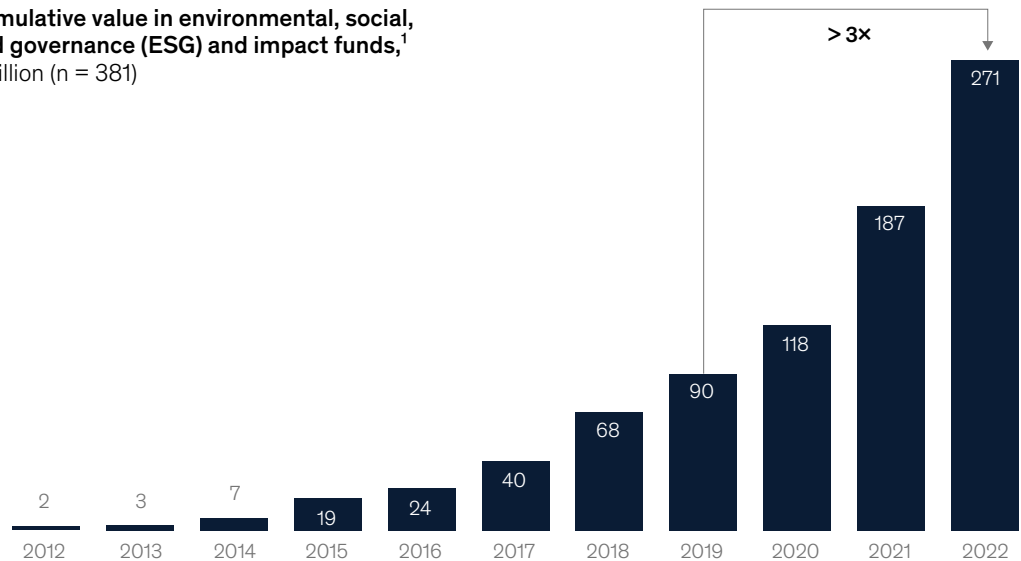
private-market deals (Exhibit 2).<sup>3</sup> That represents average annual growth of about 40 percent. In 2021, investment reached \$183 billion, an increase of almost 90 percent from the previous year. From 2021 to 2022, the level of investments grew by nearly 7 percent. That kind of performance contrasts sharply with the overall private-market equity deal volume, which declined by roughly 24 percent from its 2021 levels.

Climate-oriented equity investments in private markets have been spread across a range of subsectors (Exhibit 3). Power was the biggest recipient, taking in about 50 percent of the deployed capital from 2019 to 2022 as investment more than doubled, from \$40 billion to \$100 billion, benefiting from the continued momentum in large-scale renewables. Transportation came in second: investment increased by 370 percent during that

Exhibit 1

**Cumulative capital raised for funds related to environmental, social, and governance efforts tripled between 2019 and 2022 to about \$270 billion.**

**Cumulative value in environmental, social, and governance (ESG) and impact funds,<sup>1</sup>**  
 \$ billion (n = 381)



<sup>1</sup>Cumulative final closed size in ESG, climate, Sustainable Finance Disclosure Regulation, and impact buyout or infra funds where fund size has been disclosed. Source: PitchBook; McKinsey analysis

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period, from \$6 billion to \$30 billion, driven by the increasing adoption of electric vehicles (EVs). Hydrogen and carbon management—two prominent emerging fields—each represented only 3 percent of total climate-focused private-market equity investments in 2022. Nonetheless, they recorded the most significant growth in investment inflows since 2019: 460 percent for hydrogen (from less than \$1 billion to \$5 billion) and 1,400 percent for carbon (from less than \$500 million to \$7 billion) in addition to the significant corporate investments in these fields.

This inflow of capital has rapidly increased valuations (Exhibit 4). The median valuation-to-revenue multiple of climate-oriented equity transactions in private markets increased from about three in 2019 to about nine in 2022 for private equity deals and from about ten to about 22 for

venture capital deals. Competition for climate-focused assets from corporate capital has put further upward pressure on valuations: some energy companies are tapping their vast cash reserves to acquire growth assets in the climate solution field—for example, BP America’s purchase of the renewable-natural-gas (RNG) provider Archaea Energy for about \$4.1 billion and Chevron’s acquisition of the renewable-fuels player Renewable Energy Group for nearly \$3.2 billion.

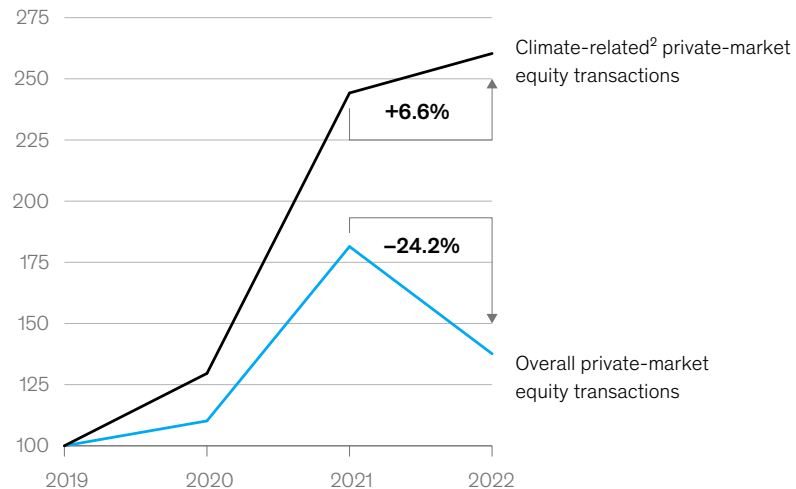
### Weathering the downturn

The 2022 performance of private-market investments in climate technologies defied powerful macroeconomic and geopolitical headwinds that sent most global capital markets into considerable turmoil. In 2023, climate investing continues to face headwinds that have

Exhibit 2

## Climate-related private-market equity investments have grown significantly despite a slowdown in the broader market.

Private-market equity deal volume,<sup>1</sup> index (100 = 2019)



<sup>1</sup>Includes completed buyout and leveraged buyout, growth and expansion, private investment in public equity, add-on, accelerator, angel, seed, early-stage venture capital, later-stage venture capital, grants, and infrastructure investments.

<sup>2</sup>Includes subsegments: transport, buildings, power, water, agriculture and land use, consumer, oil and gas decarbonization and sustainable fuels, hydrogen, waste, industrial decarbonization, and carbon management.  
Source: PitchBook; McKinsey analysis

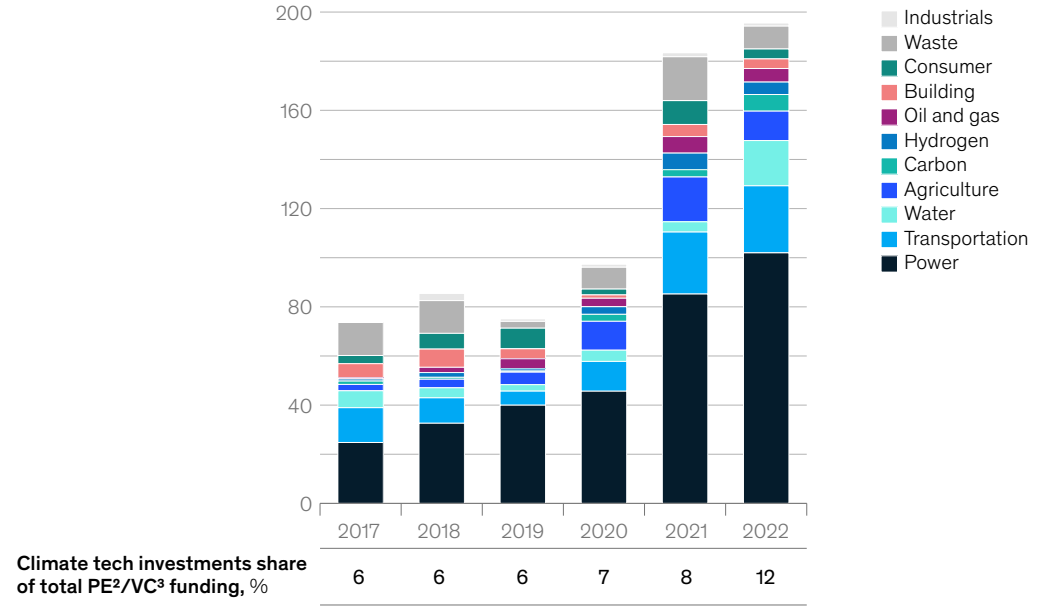
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<sup>3</sup> PitchBook, accessed December 15, 2022.

Exhibit 3

**Climate-related private-market equity investments reached \$196 billion in 2022, a nearly threefold increase from 2019.**

Climate-related private-market equity investments,<sup>1</sup> by sector, \$ billion



<sup>1</sup>Includes equity value of completed buyout and leveraged buyout, growth and expansion, private investment in public equity, add-on, accelerator, angel, seed, early-stage venture capital, later-stage venture capital, grants, and infrastructure investments; includes subsegments: transport, buildings, power, water, agriculture and land use, consumer, oil and gas decarbonization and sustainable fuels, hydrogen, waste, industrial decarbonization, and carbon management.  
<sup>2</sup>Private equity.  
<sup>3</sup>Venture capital.  
 Source: PitchBook; McKinsey analysis

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depressed both investor sentiment and the general economic outlook, slowing down capital markets across sectors and regions:

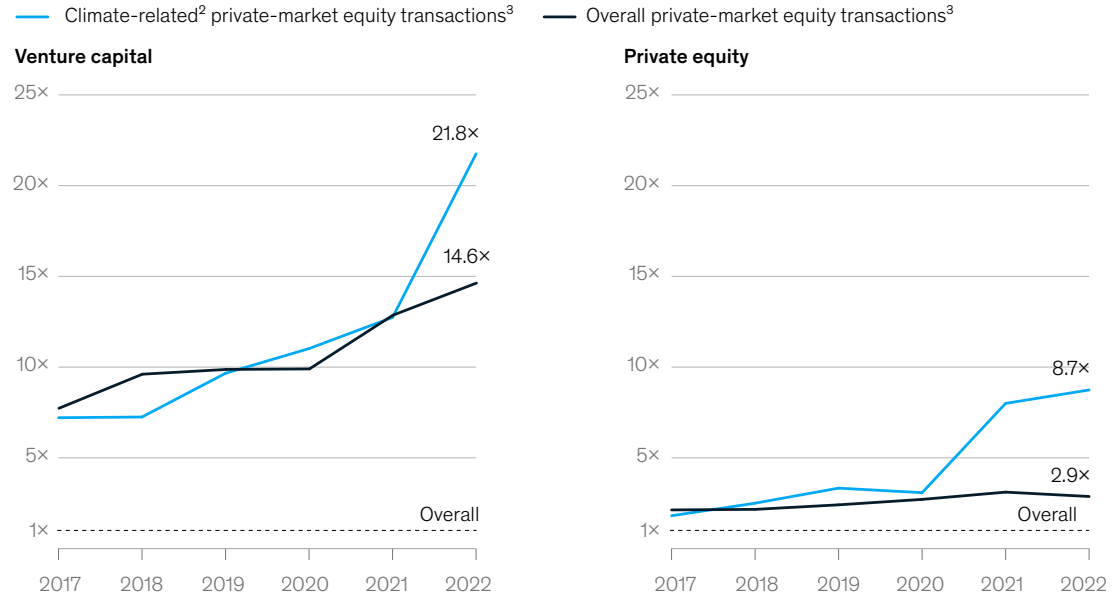
1. **High inflation**—driven by a strong labor market, pent-up demand for services, and high government spending during the COVID-19 pandemic—has sparked a cost-of-living crisis around the world.
2. **Elevated interest rates** to fight inflation have increased the cost of financing capital-intensive assets and projects while discounting the value of future cash flows for earlier-stage and growth companies. This is particularly salient for the lifetime economics of climate solutions, which
3. **Supply chain constraints and labor shortages** as economies emerge from the pandemic are increasing the cost of building and operating assets.
4. **An acute focus on energy security** has overshadowed the push for sustainability as governments and companies, particularly in Europe, seek supplies of gas, coal, and, to a lesser extent, oil to ensure sufficient reserves for this winter and next.

often involve replacing ongoing operating expenses such as fuel with upfront capital expenditures—the deployment of solar- and wind-generation assets, for example.

Exhibit 4

**Expansion of valuation multiples for climate-related private-market equity transactions has outpaced the broader market.**

**Median valuation, by type,<sup>1</sup> multiple of overall average**



<sup>1</sup>Valuation/revenue multiple; valuation defined as cumulative equity fundraising value.  
<sup>2</sup>Includes subsegments: transport, buildings, power, water, agriculture and land use, consumer, oil and gas decarbonization and sustainable fuels, hydrogen, waste, industrial decarbonization, and carbon management.  
<sup>3</sup>Includes completed buyout and leveraged buyout, growth and expansion, private investment in public equity, add-on, accelerator, angel, seed, early-stage venture capital, later-stage venture capital, grants, and infrastructure investments.  
 Source: PitchBook; McKinsey analysis

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**The difference this time**

Still, climate investing is well positioned to continue along its growth trajectory in this turbulent environment. The reason is a number of persistent, sector-specific tailwinds that have supported the recent rally and provide a stable, resilient foundation.

**1. Clear demand signals, particularly in the context of the energy crisis**

In reaction to the ongoing energy crisis, many countries have maintained—and in some cases

increased—their short-term reliance on fossil fuels.<sup>4</sup> Yet public and private entities alike have made comprehensive commitments to reduce greenhouse-gas emissions across industries and technologies. The number of companies pledging to set science-based targets, for instance, has increased more than fourfold over the past two years alone, reaching almost 2,000 in 2022. As of November 2022, around 140 countries had proposed or set net-zero targets that cover almost 90 percent of global emissions. In addition, 111 nations have made commitments to reduce

<sup>4</sup>“CAT net zero target evaluations,” Climate Action Tracker, accessed March 2, 2023.

methane emissions as part of the pledge launched by the United States and the European Union at COP26 in November 2021.<sup>5</sup> The signatories, which account for 45 percent of global human-caused methane emissions, have committed to collectively reduce the emissions by at least 30 percent below 2020 levels by 2030.

Today's pledges build on and go beyond the demand commitments that have supported early adoption of renewables—for example, the feed-in tariffs that supported solar and wind in the late 2000s and early 2010s. Multiyear offtake agreements for renewable fuels, low-carbon materials, and key input materials serve as indicators of sustained demand for climate and decarbonization technologies in the future. Furthermore, the energy crisis has highlighted the imperative of diversifying the energy supply base. Consequently, climate solutions—particularly in the power sector—have been rolled out in an accelerated fashion. In the United States alone, the demand for clean energy through corporate power purchase agreements has increased eightfold since 2015, to almost 20 gigawatts.<sup>6</sup>

## 2. Policy support and regulation

Governments, including in major economies, have taken significant legislative and regulatory action to support their climate and energy transition priorities. Since 2019, for example, the European Union's Green Deal (2019), Fit for 55 (2021), and RePowerEU (2022) programs have progressively raised the target for emission reductions by member states. As part of these initiatives, the European Union has also expanded the coverage of its Emission Trading System (ETS) to incorporate new sectors, such as maritime and aviation. Most recently, the European Commission released in

2023 the Green Deal Industrial Plan, which includes incentives for domestic production and cleantech.<sup>7</sup>

In the United States, the Inflation Reduction Act (IRA) will deploy \$370 billion in tax credits and other subsidies toward new energy solutions. In 2021, China introduced an emissions-trading system that covers carbon emissions from power plants. Since then, its carbon market has become the world's largest: three times the size of the European Union's.<sup>8</sup> Government actions—whether in the form of mandates (such as emissions reductions), subsidies (such as investment or production tax credits), or market design (such as carbon pricing)—continue to be major catalysts for climate solutions.

## 3. A decline in green premiums for climate solutions

Several mature climate solutions, such as utility-scale solar or wind, have already achieved cost parity—or discounts—compared with fossil-based alternatives. Consequently, they can access large value pools. Solutions in earlier stages of development, such as grid-scale storage or hydrogen, still command green premiums. However, these have declined over the past several years, a trend that is set to continue with accelerating deployment. As an example, while the cost of clean hydrogen has increased recently—largely spurred by construction costs—McKinsey analysis suggests significant cost reductions through the 2030s that will eventually result in cost parity between green hydrogen (produced using renewable power) and gray hydrogen (produced using natural gas), especially in countries with abundant low-cost renewables, such as Australia, Chile, and China.<sup>9</sup> Similarly, our modeling shows that the total cost of ownership (TCO) for medium- and heavy-duty battery EVs will be lower than the TCOs for their internal-combustion-engine (ICE) counterparts as soon as 2025.<sup>10</sup>

<sup>5</sup> Ibid.

<sup>6</sup> BloombergNEF; Center on Global Energy Policy at Columbia University; Science Based Targets initiative.

<sup>7</sup> "The Green Deal Industrial Plan: Putting Europe's net-zero industry in the lead," European Commission, February 1, 2023.

<sup>8</sup> "The energy transition," December 15, 2022.

<sup>9</sup> Bernd Heid, Alma Sator, Maurits Waardenburg, and Markus Wilthaner, "Five charts on hydrogen's role in a net-zero future," McKinsey, October 25, 2022.

<sup>10</sup> Saral Chauhan, Malte Hans, Moritz Rittstiegl, and Saleem Zafar, "Why the economics of electrification make this decarbonization transition different," McKinsey, January 30, 2023.



#### **4. Alignment in the capital markets and the financial system**

Despite recent market upheavals, the financial system broadly—and asset owners in particular—remain aligned around financing the energy transition. Most prominently, more than 450 financial institutions belonging to the Glasgow Financial Alliance for Net Zero have pledged about \$130 trillion toward net-zero goals. The largest and most sophisticated investors in energy, industrials, and infrastructure are all turning their attention to investment opportunities across a range of climate technologies, and in many cases, they are launching dedicated vehicles to pursue these investment opportunities. Investors and lenders have shown the ability to decrease the cost of capital for climate technologies as they mature, such as in utility-scale wind and solar projects, and now will need to work through similar journeys on the next horizon of technologies.

#### **5. Coalition building and the emergence of ecosystems**

The deployment of climate technologies at scale often requires systemic change across entire value chains. The World Economic Forum's Clean Skies of Tomorrow initiative, for instance, aims to enable airlines to make and fulfill commitments to sustainable aviation fuel. Cross-sector collaboration and standard setting are also required: for example, the Voluntary Carbon Markets Integrity Initiative aims to create a common code to inform the purchases of corporations and guide their claims for carbon credits. Such initiatives create transparency and promote the pooling of risk and investments, thereby helping to achieve step changes in decarbonization within and across sectors.

### **Doing good deals well**

Although these climate-focused tailwinds are set to persist, our analysis shows that the landscape for investors in the sector is likely to remain as complex as it was in 2022, given the more challenging macroeconomic outlook. To succeed in this environment, investors will need to exercise great caution to ensure that acquisition targets are not

only well positioned to capture the tailwinds but also insulated from macro headwinds.

We offer a framework for identifying such investment opportunities below. Specifically, we've developed eight factors, across two categories, that investors can apply to assess climate-focused deals. The first four factors are fundamental dealmakers or deal breakers, and the last four are emerging priorities that we expect to become table stakes for sophisticated investors.

#### **Dealmakers or deal breakers**

The first four factors are demonstrated technology and operational performance, a clear path to cost competitiveness, the ability to secure captive demand, and a leadership track record and the ability to attract talent.

***Demonstrated technology and operational performance.*** Emerging technologies need a credible fact base to support any claims that the market needs the solution they offer (increased energy density for battery technology, for example, or decreased thermal and water requirements for direct-air carbon capture). Investors will want to seek as much proximity to real-world conditions as possible (for example, the ability to replicate yield performance via continuous manufacturing rather than one-off production in the lab). Investors will also prefer objective third-party verified results over in-house tests. To attract later-stage private equity capital, the path to commercial-scale production and adoption should be clear, if not yet proven.

These technologies should also demonstrate a practical path toward hitting performance and cost thresholds, as well as a foundation for appropriately calculating risks in their go-forward road map, leveraging insights from the deployment of earlier projects and from analogous journeys of other technologies: for example, 99 green-hydrogen projects have been launched and are now operational in the United States, the European Union, the United Kingdom, and China. The projects have helped to demonstrate the technical and economic feasibility of at-scale electrolysis. The technology is now set to scale up

rapidly: according to the Hydrogen Council, the industry had announced 680 large-scale clean-hydrogen project proposals as of the end of May 2022, an increase of more than 160 since November 2021.<sup>11</sup> Of these projects, 61 are gigascale (more than 1 gigawatt of electrolysis for renewable or more than 200,000 metric tons a year of low-carbon hydrogen supply).

***A clear path to cost competitiveness.*** Any solution should have a viable path to achieving a cost advantage (or a durable premium position in the market) compared with incumbent offerings and alternative disruptors. The key factors for achieving a cost advantage include an accelerated learning rate, economies of scale, and design improvements. New mass-market EVs, for example, have a TCO advantage over ICE vehicles in several markets. Our research estimates that in China, heavy-duty fuel cell EVs will achieve cost parity with incumbent ICE vehicles—or even discounts—by 2025 to 2030 because of low-cost renewable power and cheap hydrogen electrolyzers.<sup>12</sup>

***The ability to secure captive demand.*** A solution should meet a near-term need for customers to make them willing to buy it or to make offtake commitments. RNG developers, for example, are securing purchase agreements for over five (and often ten to 15) years for fuel production and the issuance of associated credits. That strong demand signal has catalyzed a growing number of partnerships in RNG. These include oil and gas companies willing to co-invest in assets and infrastructure alongside private capital to support the scaling of local waste- and agriculture-based producers and to secure preferential access to future supplies of fuel and credits. In the voluntary carbon markets—carbon removal, in particular—Frontier Climate has secured advanced purchase commitments from a number of corporations to accelerate project development and improve access to capital for innovators. A similar trend is manifesting itself in the liquid-clean-fuel sector: project developers for power-to-liquid fuels (for instance, e-methanol to decarbonize the shipping industry) identify and lock in

offtake well before they design the first project. Understanding and leveraging downstream decarbonization needs and commitments are often crucial to secure this demand.

***A leadership track record and the ability to attract talent.*** The leadership team ought to have the experience and skills to navigate the next chapter of rapid growth. There should, for example, be a compelling plan to attract and develop talent. Early-stage, high-growth companies must look beyond the skill sets that initially made them attractive to investors and quickly build the capabilities to deploy the next round of capital effectively. For capital-intensive climate solutions, this requirement involves capabilities such as capital project execution, project financing, offtake negotiations, and workforce management—which are not typical focus areas for early-stage technology disruptors. To support the rapid buildout of first-of-a-kind facilities, advanced battery manufacturers, for example, have hired experienced operations leaders from the automotive, semiconductor, and solar sectors.

#### **Soon-to-be table stakes**

Soon, the ability to access and capture policy support and incentives, the readiness to hyperscale, a financing road map and a path to lower-cost capital, and the ability to create and leverage ecosystems will become table stakes as well.

***The ability to access and capture policy support and incentives.*** The policies designed to catalyze energy transitions across economies are central considerations in assessing climate-focused investment opportunities today. So too is the impact of those policies on the economic viability of individual solutions. While previous policies have been instrumental in the historical adoption of climate technologies, an expanding set of technologies will struggle to create value for investors without incentives or policies, which can affect the market at the macro level (supporting adoption across an entire sector) and the micro level (product or asset-level unit economics).

<sup>11</sup> *Hydrogen Insights 2022: An updated perspective on hydrogen market development and actions required to unlock hydrogen at scale*, Hydrogen Council and McKinsey, September 2022.

<sup>12</sup> "The energy transition," December 15, 2022.

Technologies that benefit from macrolevel policy tailwinds include sustainable aviation fuel—a way airlines plan to meet their government-imposed decarbonization mandates. More broadly, in the European Union, a range of green technologies is benefitting from higher ETS prices (which reached €100 per metric ton in February 2023). That impact will likely soon be apparent in additional sectors (such as shipping and buildings) as a result of the extension of the ETS as part of the Fit for 55 initiative.

The US Inflation Reduction Act, by contrast, includes many unit-economic incentives that could make a wide range of climate technologies significantly more attractive: the act's 45Z provision, for instance, provides up to \$3 per kilogram in production tax credits to clean-hydrogen producers. Similarly, a sizable increase in 45Q tax credits for CO<sub>2</sub> storage creates a tailwind for US carbon capture ventures: up to \$180 per metric ton of stored CO<sub>2</sub> in the case of direct-air capture.<sup>13</sup> To maximize the value of these incentives, investors can consider strategic control points along value chains, and sound analysis will help them avoid credit “leakage.” Examples could include onshore battery manufacturers with integrated lithium-sourcing operations.<sup>14</sup>

***The readiness to hyperscale.*** Disruptive climate technology companies are often celebrated for their technology innovation, yet many executives (and their investors) would cite the ability to rapidly scale their execution capabilities as even more critical to their success. The demand for climate technologies can often surpass a growth-stage company's ability to deliver—bringing forward the need to scale up manufacturing capacity, build efficient yet resilient supply chains, streamline operational processes, recruit and onboard talent at scale, and forge external partnerships.

Although capital-intensive companies have often taken a linear approach to building and scaling in the past (for instance, by proceeding one plant at a time), companies in the climate tech space are applying approaches that

significantly shorten time to market and allow for the kind of exponential growth that was mostly known only to digital companies. Key concepts include parallel scaling, rapid standardization, and modularization. EV manufacturers, for example, are developing standard, modularized production lines to allow for easy upgrades and add-ons as products develop and to allow rapidly scaling facilities.

***A financing road map and a path to lower-cost capital.*** Climate technology companies should have a clear path to reach derisking and growth milestones that help them build a balance sheet that expands to include lower-cost equity, project finance, and debt at scale. This factor will be particularly critical for capital-intensive climate solutions (such as hydrogen, carbon capture, and battery manufacturing) that require raising significant capital, building many first-of-a-kind facilities and projects, and educating investors and lenders to realize their scale aspirations.

A particular challenge will be the journey across the “valley of death” from venture capital (financing technology development and first demonstration) to project financing and debt capital (financing first-of-a-kind projects and future growth). There are several markers of success for companies that navigate through this journey: clear and committed demand from credit-worthy customers; secured access to feedstocks or input materials; a strong track record of meeting production, cost, and growth targets; and the ability to structure projects or financing vehicles with clear, stable cash flows.

***The ability to create and leverage ecosystems.*** Decarbonizing complex industrial sectors entails transforming entire value chains. That will require cross-industry coalitions and collaborations beyond the typical boundaries of companies. To overcome supply chain uncertainties, for example, automotive and battery producers have established direct agreements with mines to secure lithium and other raw materials critical for the manufacture of EVs. Wind developers have engaged with their tier-two

<sup>13</sup> “Section 45Q credit for carbon oxide sequestration,” International Energy Agency, November 4, 2022.

<sup>14</sup> Jennifer L., “EU carbon prices surge to 100 euros,” Carbon Credits, February 21, 2023.

suppliers of processed materials to lock in supplies of critical resources for their tier-one turbine OEMs.<sup>15</sup> Partnerships among competitors (such as carbon capture hub coalitions in the United States) are also emerging as a model to share capital burdens and deliver scaled solutions.

### Staying disciplined in the next chapter

The current momentum in climate-focused investing suggests that the space is breaking out—not breaking down—in the face of market complexity. Concerns about another cleantech hype cycle such as the one that unfolded from 2009 to 2011 are fading in the minds of investors. Today's climate investors continue to forge ahead and are actively pursuing deals, supported by the fact that among the 104 funds that have disclosed their dry powder, more than 35 percent of the capital is still available to deploy. In addition, new funds are being launched each month, and a growing range of investors now focus on climate solutions. In this context, it's not clear if the investable universe of climate technology companies is growing at the necessary pace. These factors, combined with continued macroeconomic and geopolitical uncertainty, mean that investors in the sector will need to be disciplined in the years ahead.

It will also be critical to gain perspective on the scale of the recent deployment of capital into climate solutions: the \$196 billion of climate-focused private-market transactions by venture capital, private equity, and infrastructure investors is merely a fraction of what's needed to achieve a net-zero pathway. (However, \$196 billion is only a portion of the overall capital deployed for climate solutions.) Achieving net-zero emissions by 2050 will mean a transformation of the global economy and how we deploy capital: McKinsey estimates that, on average, it will require \$9.2 trillion in annual capital spending on physical assets for energy and land-use systems—about \$3.5 trillion more than is spent today.<sup>16</sup>

The field of climate investing has now built a more solid foundation. Yet a new quantum of capital deployment will be required in the next chapter to meet the commitments of private- and public-sector leaders around the globe. Much more remains to be done to scale up climate investing. Identifying the most promising and resilient technologies today will affect the long-term prospects of the entire climate solution space. By extension, these investments will also determine our ability to accelerate the energy transition and achieve at-scale decarbonization in the years and decades ahead.

<sup>15</sup> Stephen Engle, Heejin Kim, and Heesu Lee, "Battery giant LG Chem prepares to lock in mineral supplies," Bloomberg, February 12, 2023.

<sup>16</sup> "The net-zero transition: What it would cost, what it could bring," joint report from McKinsey, McKinsey Global Institute, and McKinsey Sustainability, January 2022.

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# Scaling sustainable infrastructure: An interview with Marie Lam-Frendo

Marie Lam-Frendo of the Global Infrastructure Hub discusses key strategies to help infrastructure leaders gain investor support to meet net-zero goals.





**Momentum for sustainable infrastructure**

has increased significantly in recent years, but creating a pipeline of bankable, investment-ready projects remains a significant hurdle. The Global Infrastructure Hub (GI Hub), a nonprofit organization formed by the G-20, works across the public and private sectors to help advance the development of sustainable infrastructure—defined for the purposes of this article as all infrastructure needed to achieve the UN Sustainable Development Goals.

McKinsey recently spoke with Marie Lam-Frendo, CEO of the GI Hub, to discuss what can be done to develop partnerships, derisk projects and leverage public spending to attain private investment, meet local infrastructure demands, and achieve sustainable-infrastructure goals.

**McKinsey:** In terms of scaling sustainable infrastructure, what were the most relevant trends in financing and investing in 2022, and where do you hope to see improvement in 2023?

**Marie Lam-Frendo:** As the magnitude of the climate crisis came into sharper focus in 2022, so did the emphasis on financing and investing to scale sustainable infrastructure. I expect these areas to retain relevance in 2023 as well.

This shift was apparent at COP27 [the 2022 UN Climate Change Conference] and among the G-20. The actions of the NGFS [Network of Central Banks and Supervisors for Greening the Financial System] and the ISSB [International Sustainability Standards Board] were used as examples for implementing targeted policy reforms and standards development to streamline sustainable finance. There have also been substantial efforts to scale up blended finance, particularly through the development of country-specific programs like the Just Energy Transition Partnerships. These programs help develop sustainable-finance solutions that can be replicated in other jurisdictions. Although still at an early stage, both mechanisms can help infrastructure players derisk and scale up investments and gain more systematic support from private-sector investors.

Private-capital mobilization has been a priority for the G-20. The private sector is similarly looking for more efficient ways to deploy the substantial amount of money that has built up over the past decade or so of underinvestment. The multilateral system can help enable and shape infrastructure financing and investment for 2023, particularly by derisking investments. The recent review of multilateral development banks' [MDBs'] capital adequacy frameworks emphasized the need for MDBs to mobilize more private-sector investment. The G-20 Finance Track helped with this work, which, to me, is an example of the role that a group like the G-20 can have in driving much-needed change.

Our multilateral institutions and the global financial architecture must adapt, however, to meet the urgent need for sustainable development during the climate transition while navigating the current complex economic and geopolitical environment. Some prospective financing and investment solutions can be massively grown and given incentives through international or multilateral efforts, and we need to take this opportunity.

Over the past 12 years, the G-20 has worked on infrastructure and has put out 90 recommendations, but few have been implemented. Rather than putting all our energy toward finding a gold-plated system that will solve every problem and advance every solution at the same time, we can start with specific, feasible actions and implement them in collaboration. It is difficult to align 20 countries on specific commitments that might run counter to their agendas domestically or internationally, but we must find ways to move forward to contend with the time pressure imposed by the climate crisis.

**McKinsey:** You mentioned a renewed momentum behind collaboration despite the complex geopolitical environment. What are some of the values that make these collaborations work?

**Marie Lam-Frendo:** To negotiate well, you need to understand what the other side wants, and to do that, you also need to approach the partnership with humility to show that no one is more important



than anyone else, and everyone must participate equally to make the project happen. The hesitations we've seen around public–private partnerships [PPPs] in recent years are a result of the erosion of trust between the public and private sectors in both developed and developing economies.

For these reasons, it's especially important to show a bit of vulnerability in a partnership to remember why you're all working together. Infrastructure investment is not a ribbon-cutting exercise; the objective should be to ensure that our people and communities have better access to services that will allow them to contribute to the economy and, more generally, to have societal well-being and greater equity—like our kids being able to get to school faster, or our parents being able to get to medical appointments on their own and maintain mobility late into their lives. Each partner should recognize that they're not doing a project for themselves; they're serving a bigger purpose. Ultimately, we're here to serve our community wherever we sit—on the government side, the engineering side, the financing side, or the legal side.

**McKinsey:** What types of risk-mitigating measures can encourage or derisk channeling funds into emerging-market infrastructure?

**Marie Lam-Frendo:** Not many countries have attained a triple-A rating, and this includes OECD countries. If a country is below that level, attracting investors is more complicated. At the same time, we are also at a tipping point with the banks. Our flagship *Infrastructure Monitor* report has shown that banks are pulling back from infrastructure because of the implementation of the Basel III reforms, which will have a tremendous impact on banks' ability to continue lending. But if banks stop lending, emerging economies that do not have deep or strong local capital markets will have a hard time sourcing debt, limiting the ability to invest in infrastructure. More recently, rising inflation has also made debt less available and more expensive.

In terms of risk mitigation, the risk span of infrastructure is quite broad. It's important to realize that there are different types of risks: there is risk within the transaction, and there is risk in the enabling environment. This year, the GI Hub is working to map the coverage and role of the many risk mitigation instruments that exist in MDBs and similar institutions. It's important to understand the landscape and what is available in emerging versus developed economies. In some economies, for example, there are risks that can be allocated from the government to the private sector, but not everything can be shifted there. To help bring

**'Each partner should recognize that they're not doing a project for themselves; they're serving a bigger purpose.'**

—Marie Lam-Frendo

clarity to this area, we are putting together a repository that catalogs what funding is available and where for specific-sized projects, in addition to the volume of funding used on risk mitigation to date.

Among G-20 economies in 2019, only 38 percent had a national infrastructure plan. That type of plan is important for a country's long-term strategy, and it also provides some reassurance to investors that there is a pipeline of investments coming. An initiative we're working on in collaboration with the G-20 to help develop these strategies is GI Hub's InfraTracker, which will help governments create these plans and pipelines for investment by tracking public investment in infrastructure.

**McKinsey:** What innovations do you see for the infrastructure sector in the future?

**Marie Lam-Frendo:** There is growing momentum around embedding technology into infrastructure. Investing in infratech would help the infrastructure

sector work faster and cheaper with better outcomes. We have yet to learn how to finance these investments at scale and include them with other technologies that are supported by venture capital investors. Blended finance can help scale this up and derisk the technology, and the GI Hub is working on this topic.

The private sector has been a strong advocate of the innovations and benefits infratech could bring. While some of these technologies are not too expensive, we need to ensure that whatever is built today is future-proof; we expect those assets to serve us in 50 years' time. We also need to think about infrastructure not only as a path to economic growth or job productivity but also as a way to achieve net-zero targets. Employing the right technology is critical to hitting those targets. We shouldn't limit our thinking about innovation to any one sector or technology, but rather embrace collaboration among governments, investors, and tech creators to scale these solutions and put them on the market quickly.

**Marie Lam-Frendo** is CEO of the Global Infrastructure Hub.

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