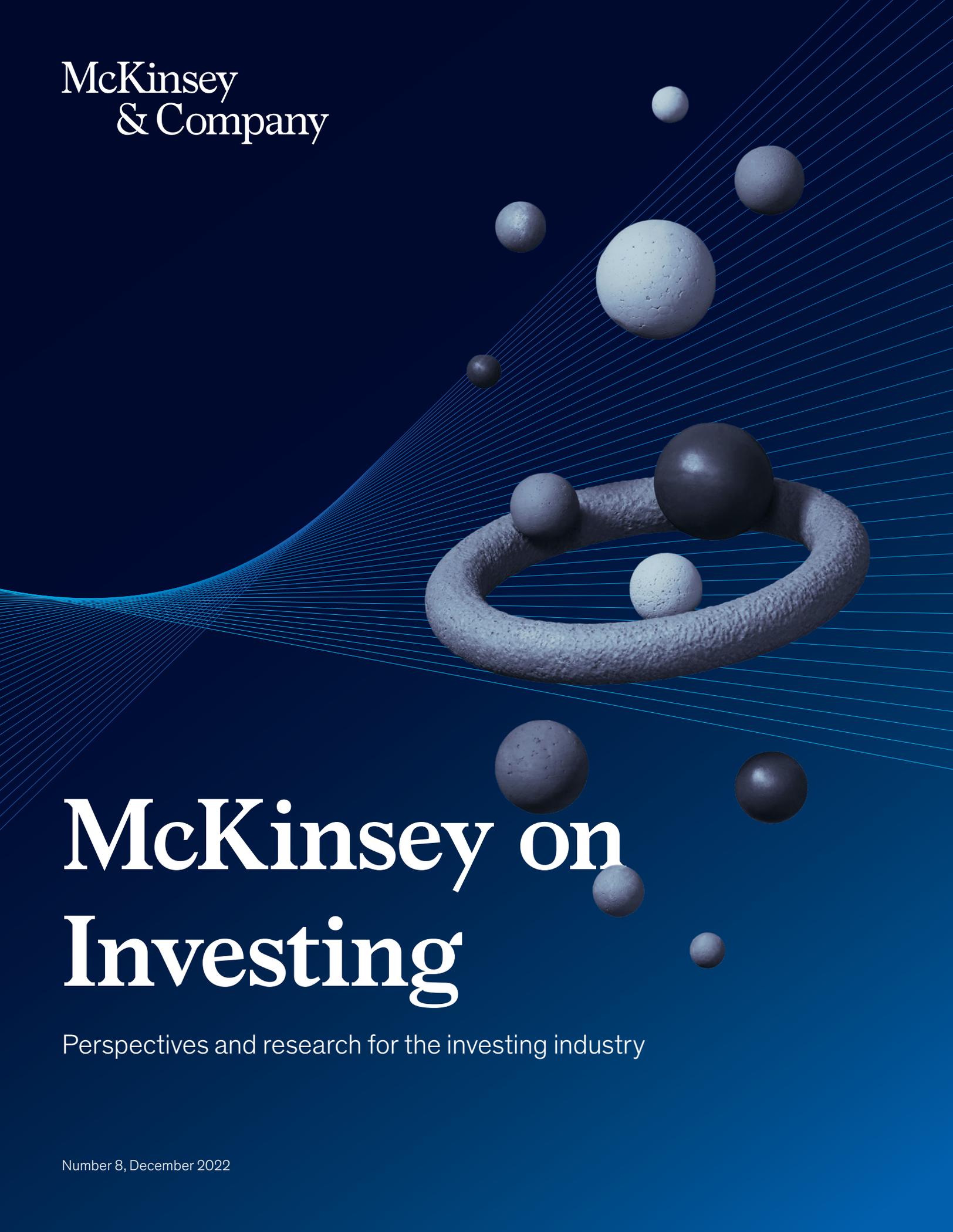


McKinsey
& Company



McKinsey on Investing

Perspectives and research for the investing industry

Number 8, December 2022

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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Contents

Building a better investment firm



7 'Making the world a better place never feels like work': An interview with chief DEI officer Indhira Arrington

Ares Management's first global chief diversity, equity, and inclusion officer talks about how she is building the company's DEI strategy from the ground up.



12 Forging your own path: Sandra Horbach on building a career in private equity

The cohead of US buyout and growth at Carlyle shares thoughts on the state of private equity, the path forward on diversity and inclusion, and advice on building a successful career in the industry.



17 How an acquisition invigorated an asset management leader

Jenny Johnson, president and CEO of Franklin Templeton, explains how the firm's acquisition of Legg Mason positions it for the next phase of growth.



22 The state of diversity in global private markets: 2022

New research captures regional differences in the state of diversity in private equity and discusses the role of institutional investors as a catalyst for change.



35 'If you're going to build something from scratch, this might be as good a time as in a decade'

In an interview with the editorial director of the *McKinsey Quarterly*, venture capitalist Bill Gurley explains the promise and perils facing start-ups at a moment of economic uncertainty and reveals why hybrid work may be the most interesting technology of all.



41 Infrastructure investing will never be the same

Traditionally staid and stable, infrastructure investing has been shaken up by revolutions in energy, mobility, and digitization, making it imperative for investors to reassess the strategy's risk and return dynamics.



49 US wealth management: A growth agenda for the coming decade

Mounting hopes of postpandemic recovery signal an imperative to prepare for the changes in technology, consumer needs, and society that will shape the future of the wealth management ecosystem.



63 It's time to become a digital investing organization

AI and other digital technologies are ushering in the next horizon of performance differentiation. Here's how to level up.

Exploring investment themes



70 Highlights from McKinsey's 2022 sector research

- 71 **Advanced electronics**
- 72 **Aerospace and defense**
- 73 **Agriculture**
- 74 **Automotive and assembly**
- 75 **Capital projects and infrastructure**
- 76 **Chemicals**
- 77 **Consumer**
- 78 **Engineering, construction, and building materials**
- 79 **Financial services**
- 80 **Healthcare systems and services**
- 81 **Life sciences**
- 82 **Oil and gas**
- 83 **Retail**
- 84 **Travel, transportation, and logistics**

85 Why private equity sees life and annuities as an enticing form of permanent capital

Private acquisitions of in-force books are growing. Here's a playbook for those considering market entry, those already in, and insurers wondering how to respond.



93 Digitally native brands: Born digital, but ready to take on the world

By applying the right criteria, investors can identify digitally native brands with the potential to outperform.

100 Climate risk and the opportunity for real estate

Real-estate leaders should revalue assets, decarbonize, and create new business opportunities. Here's how.



108 Innovating to net zero: An executive's guide to climate technology

Advanced technologies are critical to stopping climate change—and the drive to develop and scale them is accelerating. Here are five themes that could attract \$2 trillion of annual investment by 2025.

Introduction

Welcome to the eighth volume of *McKinsey on Investing*, our flagship compendium of insights relevant to investors. These perspectives have been contributed by McKinsey colleagues across the globe who are experts in a diverse array of disciplines, including asset management, institutional investing, and private markets.

It's a turbulent—and busy—time in private markets. Portfolios are fuller than ever and there is significant dry powder across the industry. Yet fundraising and deal making for larger transactions are well off 2021's highs. Further, the slowdown in exits, coupled with declining public market valuations and the resulting denominator effect, has shifted investor allocations. As a result, the current fundraising environment is far more challenging than in the past several years. Finally, the availability of debt has fallen even as its cost has grown rapidly, making transactions difficult.

In times like these, value creation in a portfolio becomes a crucial differentiator for firms and funds, focusing minds on pricing, procurement, and supply chain resilience and reconfiguration. Though financing is challenging and uncertainty high, we continue to see our clients pursue opportunities even as they manage for uncertainty in their portfolio companies. This strategy has yielded results in the past: firms that were more aggressive with integrations, capital reallocation, and investing for growth during previous corrections were able to accelerate out of the downturn. We will continue to publish insights as private markets evolve; if your fund would like a preview of our perspectives, please write or call and we will be pleased to arrange a discussion.

This issue of *McKinsey on Investing* steps back from the immediate challenge of the market— and the broader macroeconomic and geopolitical uncertainty— to present a longer-term perspective on how investment firms are evolving and the thematic ways investors have and will put money to work. We are also pleased to include new research that captures the state of diversity in private equity while discussing the role of institutional investors as a catalyst for change.

We hope you enjoy this collection and discover in it ideas worthy of your consideration. You can find these and other perspectives 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

Marcos Tarnowski

Brian Vickery

Notable facts and figures

Despite market uncertainty, leaders are adapting their search for investments and their firms' operations to uncover unique opportunities.



\$3.5 trillion

Total capital deployed across private market asset classes in 2021¹

\$2 trillion

Annual investment toward next-generation climate technologies by 2025²

\$52 billion

Venture capital investments in the biotech industry from 2019 to 2021³

\$10 billion

Private funding in space-related companies in 2021⁴



48%

Private equity entry-level roles globally that were filled by women in 2021⁵

3,500

Number of global investment managers and institutional investors who signed the UN-supported Principles for Responsible Investment in 2021⁶

\$1.5 trillion to \$1.6 trillion

Annual investment in energy supply and production by 2035 to meet emission-reduction targets⁷

¹ *Private markets 2022: Private markets rally to new heights*, McKinsey, March 2022.

² Tom Hellstern, Kimberly Henderson, Sean Kane, and Matt Rogers, "Innovating to net zero: An executive's guide to climate technology," McKinsey, October 28, 2021.

³ Olivier Leclerc, Michelle Suhendra, and Lydia The, "What are the biotech investment themes that will shape the industry?," McKinsey, June 10, 2022.

⁴ Ryan Brukardt, Jesse Klempner, and Brooke Stokes, "Space: Investment shifts from GEO to LEO and now beyond," McKinsey, January 27, 2022.

⁵ "The state of diversity in global private markets: 2022," McKinsey, November 1, 2022.

⁶ *Private markets rally to new heights*, March 2022.

⁷ *Global Energy Perspective 2022*, McKinsey, April 2022.

Building a better investment firm

7

'Making the world a better place never feels like work': An interview with chief DEI officer Indhira Arrington

12

Forging your own path: Sandra Horbach on building a career in private equity

17

How an acquisition invigorated an asset management leader

22

The state of diversity in global private markets: 2022

35

'If you're going to build something from scratch, this might be as good a time as in a decade'

41

Infrastructure investing will never be the same

49

US wealth management: A growth agenda for the coming decade

63

It's time to become a digital investing organization



‘Making the world a better place never feels like work’: An interview with chief DEI officer Indhira Arrington

Ares Management’s first global chief diversity, equity, and inclusion officer talks about how she is building the company’s DEI strategy from the ground up.



The business case for diversity, equity, and inclusion (DEI) is stronger than ever, but many companies' DEI programs are stalled or have slipped backward. That's because intentions aren't the same as execution and process infrastructure—something that Indhira Arrington learned in her first year at the global alternative asset management firm Ares Management (Ares), for which she is the managing director and first global chief DEI officer (CDO). Arrington believes that Ares needs to embed DEI into many aspects of what it and its portfolio businesses do, including human capital, business, and investment processes.

In an interview with McKinsey's Diana Ellsworth and Drew Goldstein, Arrington discusses why it's important to listen and gather data before creating a DEI strategy and why she's focused on building a culture of representation, especially when it comes to recruitment, retention, and talent development. As an immigrant from the Dominican Republic, Arrington feels an enormous responsibility to open doors for others, as sponsors and mentors did for her. "Making the world a better place never feels like work," she says. The following is an edited version of their conversation.

McKinsey: Why is DEI important to Ares?

Indhira Arrington: The whole point of our DEI strategy is to be a force for good for Ares, for the companies in which we invest and in the communities in which we operate. We recognize the power and influence that we have to create

change beyond our own walls. And we know that if we can help our portfolio companies become more inclusive, more equitable, that can help drive long-term performance. Before I was hired, DEI at Ares was largely employee driven. But our leadership recognized that we needed a formal structure. And so my role reports to both talent, meaning HR, and the CEO.

We're operationalizing DEI through our people and culture, as well as our business and investment process. We're ensuring that we have the infrastructure, strategy, plans, goals, and KPIs to hold ourselves and select portfolio companies accountable. We drive DEI in our investment process because we believe it can lead to better ROI, and so we have a DEI lens when we make investments. We've intentionally woven DEI into our procurement processes, working to identify current diverse spend and then find areas where we can transfer spend to diverse suppliers. We're seeking to lead by example so that we can be in a position to offer advice to our portfolio companies and create a playbook for how they, too, can approach supplier diversity. We're also looking at the impact we have on our communities through our philanthropy, maximizing our giving, our employee volunteerism, and our matching of employee donations.

What I love about our approach is, at the core, we're data driven. We're setting KPIs, and we're holding ourselves accountable for the change we want to see—because we believe that what gets measured gets done.

'We're holding ourselves accountable for the change we want to see—because we believe that what gets measured gets done.'

Indhira Arrington

Vital statistics

Born in 1977 in Santo Domingo, Dominican Republic

Married, with 2 sons

Education

Holds an MBA from New York University Stern School of Business and a bachelor's degree in economics from Rutgers University

Is a Cornell Certified Diversity Professional/Advanced Practitioner (CCDP/AP)

Career highlights

Ares Management Corporation
(2021–present)
Managing director, global chief diversity, equity, and inclusion officer

Wells Fargo
(2018–21)
Senior vice president, head of targeted sourcing

Bank of America

(2014–15)

Senior vice president, head of diversity recruiting relationship management

(2012–14)

Senior vice president, diversity and inclusion sponsorship management

(2010–12)

Vice president, diversity and inclusion, executive diversity recruiter

(2009–11)

Vice president, diversity and inclusion, global banking and markets

Fast facts

Serves on the board of directors of Poly Prep, the Committee for Hispanic Children and Families, and the Council of Urban Professionals

Sits on Milken Institute's Diversity, Equity, and Inclusion in Asset Management Executive Council

Member of Omicron Delta Epsilon, Phi Beta Kappa Society, Association of Latino Professionals for America (ALPFA), and PRIMER Network

Enjoys yoga and watching her children play sports

McKinsey: As your organization's first CDO, how did you begin?

Indhira Arrington: I came in focused on listening. In this job, there's work to be done everywhere you look. It's difficult not to rush in and start trying to get things done right away. And I'm super type A, so it drives me crazy not to jump into execution. But I

took a very pragmatic approach and made the first 90 days about data gathering.

We began with a quantitative and qualitative assessment of the starting point for us and a cohort of our portfolio companies. When I think about data from a human capital perspective, I keep things simple. For me, it's $a + b - c$: recruiting plus

promotions minus departures. Cut that by a diversity dimension and by title, and you can clearly see at any point what your representation looks like. It's a nice way to start mapping out which people you need to spend time with and which processes to evaluate to understand how we got to where we are.

I met with over 120 team members one by one. I was after three things: to see how they felt about working at Ares, where they thought we were on our DEI journey, and what they thought success should look like from a DEI perspective. I also looked at some external surveys to glean insight into how employees were experiencing the organization through the dimension of diversity. Finally, I met with functional leaders.

The most challenging part of being a CDO is that you don't own any place where the work gets done. You don't own any of the functions. I'm meant to drive change through influence, which is awesome but can also be challenging. So I sat with functional leaders from recruiting and HR to understand our talent management process and with business leaders to understand how they viewed DEI from a business perspective and the procurement function. I worked to gather as much information as possible.

McKinsey: How did you create your strategic DEI plan?

Indhira Arrington: Once we understood where we were from a DEI perspective, we set out to form a strategic plan. Together with a core set of our portfolio companies, we went through a pipeline assessment to help identify our diversity gaps, an infrastructure assessment to see whether we had the infrastructure in place to operationalize DEI, and an inclusion assessment that included a global inclusion survey across all participating firms. That last assessment gave us quantifiable inclusion ratings, as well as our gaps by diversity dimension, line of business, title, and location. We could look within our firms and be very surgical about how we were going to narrow those gaps.

We then worked with these portfolio companies to create strategic plans for each individual firm, in addition to further refining Ares's own strategic plan. Each developed a three-year DEI plan of its own, with a vision, objectives, initiatives, and metrics to monitor. In total, more than 200 DEI initiatives were planned. Some targeted, for instance, increased representation of women and Black, Indigenous, and people of color colleagues at the manager level and above. Some targeted increased diversity among suppliers. We upskilled our own team members who sat on those portfolio company boards so they could help drive DEI from the boardroom. We prepared each company to add DEI to the board agenda on a quarterly basis and are supporting them to execute on it. We've set up a community with members from each firm, which meets monthly to share best practices.

McKinsey: Where have you seen the DEI strategy make the most difference?

Indhira Arrington: One process we were able to change within Ares—and make it the new way we do business—was in our recruiting. We set out to increase representation where we have gaps. We found that we weren't seeing enough diversity at the job seeker and qualified-candidate levels. We also saw that not enough candidates were getting through our funnel and making it to first-round interviews. We decided to change our process.

We began implementing diverse talent slates at first-round interviews. We launched a pilot in the US where we require a minimum of four candidates in first-round interviews, and at least half must be diverse. We worked with our recruitment team to source diverse talent for the slate and with our search firms so they also can support the diverse-slate mandate.

We are also extremely proud of launching the AltFinance Investing in Black Futures initiative. The asset management industry is one of the least diverse in the US, with a substantial lack of Black talent. We decided to help solve this industry problem. Through the Ares Charitable Foundation,

along with two industry peers, Apollo Global Management and Oaktree Capital Management, we jointly committed \$90 million over a period of ten years through the Ares charitable foundation to start a nonprofit focused on engaging, attracting, and creating a pathway for HBCU [historically Black colleges and universities] students to join the asset management industry.¹ It also provides need-based scholarships.

AltFinance Investing is partnering with the Wharton School of the University of Pennsylvania

to create a curriculum for students to understand the different verticals and careers within the asset management industry, get through industry case study interviews, and hopefully join us for a successful summer internship.² And then it's about converting the interns to full-time employees and working with the recruiting teams at our firms to hire the students and set them up for success. I'm excited to share that we and other firms recently welcomed our first cohort of interns.

Indhira Arrington is a managing director and the global chief diversity, equity, and inclusion officer of Ares Management. **Diana Ellsworth** is a partner in McKinsey's Atlanta office, and **Drew Goldstein** is an associate partner in the Miami office.

Comments and opinions expressed by interviewees are their own and do not represent or reflect the opinions, policies, or positions of McKinsey & Company or have its endorsement.

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¹ Miriam Gottfried, "Apollo, Ares and Oaktree team up on initiative to lure Black talent," *Wall Street Journal*, June 15, 2021.

² "Apollo, Ares and Oaktree to launch \$90 million initiative for students at historically Black colleges and universities," Wharton School, University of Pennsylvania, June 15, 2021.

Forging your own path: Sandra Horbach on building a career in private equity

The cohead of US buyout and growth at Carlyle shares thoughts on the path forward on diversity and inclusion, and advice on building a successful career in the industry.



This conversation between Sandra Horbach, managing director and cohead of US buyout and growth at Carlyle; Rodney Zimmel, senior partner and global leader, McKinsey Digital; and Alexandra Nee, partner and global head of diversity, equity, and inclusion for the Private Equity & Principal Investors Practice was recorded on October 26, 2021. It was part of McKinsey's Women in Private Equity Global Forum, held virtually, with an audience of 143 women investors from 46 firms across North America and Europe. The following is an abridged transcript.

Rodney Zimmel: While Sandra Horbach certainly needs no introduction in a group like this, I'm thrilled to have the cohead of US buyout and growth at Carlyle with us. Ms. Horbach oversees Carlyle's three largest private equity funds, with approximately \$60 billion in capital under management. Prior to joining Carlyle, Ms. Horbach was a general partner with Forstmann Little & Company and also worked in the M&A department of Morgan Stanley. She earned her MBA from Stanford University and BA from Wellesley College. I'm thrilled to introduce Sandra to you all and look forward to our conversation today. Welcome, Sandra!

Alexandra Nee: Sandra, one of our first questions is this: As we think about how the private equity industry has changed recently, we would love to get your thoughts—for some of the women investors we have joining us—on how private equity has changed as a career over the last decade. And how will recruiting into these private equity roles be affected by this going forward?

Sandra Horbach: I would say one thing that has been a welcome change is a lot more focus on diversity. Unfortunately, a lot of investment firms are still not anywhere near where they need to be, especially at the senior levels, in terms of having diverse teams. We really think diverse teams result in better investment decisions. I've seen it over and over again: when we bring in diverse perspectives, we come out with a better outcome. That's true of investment decisions. It's also true of business decisions at the board level and within portfolio companies. So, we still have a long way to go as an industry, but I'm thrilled to see that there is definitely a lot more focus on diversity.

In terms of recruiting, I would say that we see more focus on specialization. When I started in the business, everybody was a generalist because, first of all, there weren't that many of us and the businesses were much smaller. But today, amid so much competition, you really have to have an area in which you specialize.

The second thing I would say is I think that firms are looking for people coming out of different backgrounds, so not just necessarily the traditional consulting or investment banking backgrounds. I think people are opening the aperture to people with industry experience or other types of functional experience.

The last thing I would say is there are a lot of other important players who create significant value, both in the diligence process and post-acquisition, during the value-creation process. Those are some of the functional experts that I mentioned on the digital side, on the talent side, IT, et cetera. They drive a lot of value. So that's going to be, I think increasingly, an area where people are leaning in and where we're even hiring data scientists.

Alexandra Nee: You made partner initially at Forstmann Little and then obviously have been tremendously successful at Carlyle since. Is there any advice that you have for other women looking to advance to [the] top levels of their firms?

Sandra Horbach: It was a very different era when I made partner. At Forstmann Little, I was the first woman, but there were only five other people there when I joined, so I was the sixth investment professional. Fortunately, I was in a growing industry; and it's always great to be in a business or a sector with tailwinds because as you grow, you can take on additional responsibility and advance very quickly. Today, private equity is a more mature business. The firms are more established, and they have more people, and so it does take longer to go through that path.

I also think the skills that we're bringing as investors are so much more sophisticated than when I started out investing back in the late '80s. The value creation

that sponsors are bringing to portfolio companies, and the complexity of the world, and the diligence that we do has completely changed. As a result, it takes time to get to the level where you're able to master all of that to run and lead deals, which is really our definition of what an MD [managing director] should be able to do.

So, in terms of advice, I would say the most important thing is to be brave, be your own advocate, and don't cower away from the challenging assignments. One of the most significant assignments I ever had was going in to look at a turnaround that we'd invested a lot of capital in. It was almost a bet-the-firm type of investment that had gone south. I thought, "I can't believe they're asking me to do this, because what do I know?" But I jumped in, and I lived at this company for three or four months, trying to understand the problems so I could make my best recommendations for the changes we had to make. We were successful in the end, and it turned out to be one of our most successful investments. It was one of the best things that could have happened to me because I was thrown in, and it was tough.

But if you are successful in those types of situations, you get a lot of credit, and you'll advance your career. You learn so much more, usually, in those situations where you're struggling. So, don't be afraid of a tough assignment; in fact, volunteer!

The last thing I'd say is, I always tell the folks at Carlyle, "Use your voice and own the room." I mean, you have to feel as though you deserve to have a seat at the table. And I'm telling you right now, you all do. But you have to own it and be responsible for that and manage your own careers.

You can't expect somebody else to be looking out for you. It's nice if they do; it's nice to get sponsors—that's great; mentors are great. But at the end of the day, it's on all of us to decide what we want to do and how forward-leaning we want to be. And then we just have to lean in. As I always say, "When someone opens the door, walk right through it, and go for it."

Alexandra Nee: Sandra, at Carlyle, you've initiated a charge to make sure at least 50 percent of the firm's incoming class are women or minority [candidates].

I'd appreciate if you can talk about why this is important and what challenges, if any, your firm has had in implementing this. And also, are there things that you've learned which other firms looking to follow suit can do to be successful here?

Sandra Horbach: Yes. I have learned that it must start at the top, and you have to be serious about it if you want to see change because it's so much easier just to hire somebody who looks just like you and went to the same school and same fraternity or worked in the same investment banking group and what-have-you. So, you really have to be committed to it. We've been committed to it for over a decade.

I would encourage other firms that are truly serious about diversity to set the policy and enforce it. We've seen that's the only way it works, and it's not going to happen at the speed that we all are looking for it to happen if we don't.

For the past eight years, all our incoming classes on my team have been at least 50 percent diverse. That's our pipeline of future leaders. Also, for all lateral hiring, we require a diverse slate, and that actually goes through our Diversity, Equity & Inclusion Council, which I'm a member of. The council is led by our CEO, and all the senior fund leaders in the firm are members, so that obviously speaks to how we view its importance.

Rodney Zimmel: Another question from the audience just starts with a thank you for being such a role model in the investing industry for so many women. Then it goes on to ask, "How is Carlyle approaching work-life balance in the new COVID-19 normal, or the hopefully soon post-COVID-19 normal—and particularly for working moms?"

Sandra Horbach: Flexibility is the most important thing you can give. Carlyle is back in the office now, but we have gone back in a hybrid model, so we are giving a lot of discretion to managers. For my teams, we are back three days a week, but each team can choose which three days those are, and those include travel days. If you're out traveling for three days at board meetings, when you return, you can work remotely from home. What we, and I think all companies, learned in the pandemic is we can trust

our employees: they are awesome and driven. I guess if you're in this industry, it's safe to say you probably all are. Based on what we've seen, people worked as hard, if not harder, during the pandemic.

We have dedicated employees, and they want to get their jobs done, but they do want flexibility and they deserve it. We all work really hard, so the more flexibility we can give to our teams, the better.

In terms of work-life balance, I do worry that the increased velocity in deal timelines that we're seeing really takes a toll on the team. What used to be an already intense four-to-six-week process is now condensed into a three-week process. That's going to hurt us over the long run. It's going to hurt morale. But I think it'll especially hurt women. Because, let's face it, we do carry a little bit more responsibility, in most cases both at the office and at home.

You can have the best policies in the world, but you also need a culture that supports diverse employees. In order to retain talented women, I think the most important thing you can give, especially now that firms understand you can be very effective working remotely, is flexibility (especially when someone's earlier in their career and they are trying to balance family, work, and other responsibilities). So, for us, if someone wants to take an extended period of time off beyond our standard parental leave policy, we hold the position open for them when they come back. To me, it's less about the policies you put in place than the culture and the attitude that embraces people's circumstances.

In the early days, people would say, "Do you think she's going to come back after maternity leave?" I would respond, "Would you ever ask that of a man? No. Of course, she's going to come back." She didn't go to Harvard Business School or the Stanford Graduate School of Business and work four years before that and work here for the last eight years, just to walk away now.

So, it's a long journey, but it's about shifting the mindset and creating a truly inclusive culture. This is the responsibility of the leaders of an organization. If you say one thing and you are acting differently, people see that.

It's also on all of us to speak up. It's about using your voice so that if you have an issue, you shouldn't just hold onto it yourself and think you're going to have to figure it out alone. Because I know people who ended up quitting because they couldn't handle certain things, but they never raised [those issues]. So, make sure you ask for help if you need it and understand that if you're doing a great job, firms want to keep you, so they'll work with you to adjust things accordingly. It will help not only you, but [also] the whole firm's culture of inclusivity.

Alexandra Nee: What do you think private equity investment professionals don't spend enough time on when looking at deals? What are the common missteps or the errors that cost them?

Sandra Horbach: I think it's the people side, because I think a lot of private equity folks are very transactional. Now, with this compressed time frame, it's hard to get quality time with management teams that are going to be your partners over the next four to five years. When I started in this business, you basically lived at the company for a month while you were doing your diligence. You really got to understand the culture, people, and strengths of an organization before you made the investment, as well as, naturally, the opportunities for improvement. It's very hard to do that in today's marketplace.

The most successful PE leaders are those who continually develop their network and relationships so that they have a relationship with someone before we get to the point where we're talking about an investment. I always say, "If you meet a management team for the first time at a management meeting, you have already lost the deal." Because someone else was there, and they've got a leg up, an advantage in that transaction.

That is actually good advice for women because I think men do it better than women because we have so many other things we're juggling. But you have to take time to develop and advance your network, keep it current, and cultivate it. It's so easy to just get absorbed doing work all the time, and the relationship cultivation can always be put off till tomorrow. But over the long run, over your career,

those relationships are really going to serve you well if you've been a good partner. And it's been a two-way street in terms of what you've given to those other professionals.

Rodney Zimmel: What [are] one or two pieces of career advice, particularly for women who are building careers in PE, that you'd want to pass on?

Sandra Horbach: I would say, "Keep at it." If you feel like your career is going to be limited in your current firm or you don't like the culture, don't stay there, but don't leave the industry. Go and find another firm. Believe me, there are so many firms out there now. Just redirect and pivot. It doesn't have to be a name brand firm where you can go and get a positive, great experience—because this industry is so much fun. I mean, we get to see so many different types of businesses and situations, with so many amazing management teams and people, all while working with really smart people within our own firms. You are never bored in private equity. I've never been bored in 30 years.

Tenacity, resiliency, grit—they pay off over a career.

The other piece of advice is just that there is no substitute for hard work. Many people ask me, "How do you get to this or that level?" I always have the same response: "Do the best job you can in the current job you're in." That's how you get to the next level—really distinguish yourself and make sure you become indispensable in some area. And try to have fun too!

Don't take yourself too seriously. There are tons of bumps along the road. My career looks like it was just straight lines. But it wasn't, and no one's is. You have to go with it to be able to deal with setbacks and failures and not let them get you down. I wish everybody well, and again, I'm happy to have been a role model for many years. I just want to see a lot more women in senior roles be able to play that role for their organization as well.

Thank you for reading the abridged transcript of the conversation between Sandra Horbach, Alexandra Nee, and Rodney Zimmel.

For more information on the work of McKinsey's Women in Private Equity Global Forum, visit our page, "[Women in private equity](#)."

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The authors wish to give special thanks to Carlyle's Michael Mazza and McKinsey's Chris Gorman, Theodora Koullias, Anna Pione, and Jessie Shortley for their help orchestrating this October 26, 2021, fireside chat with Sandra Horbach as part of McKinsey's Women in Private Equity Global Forum.

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How an acquisition invigorated an asset management leader

Jenny Johnson, president and CEO of Franklin Templeton, explains how the firm's acquisition of Legg Mason positions it for the next phase of growth.



Jenny Johnson grew up in the investment management business, rising through the ranks of Franklin Templeton (a firm founded by her grandfather) for 32 years before taking over from her brother as president and CEO in early 2020. Within days, she announced the biggest transaction in the company's history: the acquisition of Baltimore-based competitor Legg Mason.

The \$4.5 billion transaction roughly doubled Franklin Templeton's assets under management (AUM) to \$1.5 trillion and made it the sixth-largest independent investment manager in the world. The merger brings to Franklin Templeton additional expertise in core fixed income, equities, and alternatives, and expands its multi-asset investment solutions. McKinsey's Robert Byrne spoke with Johnson recently about the challenges of blending cultures in a merger of equals, the disruptions coming to the asset management industry, and the need to democratize access to high-return investment opportunities. An edited version of their conversation follows.

Robert Byrne: This acquisition seems like a baptism by fire for you as a new CEO. A few weeks after you took over and announced the acquisition, the pandemic hit. What was it like to go through so many experiences at the same time?

Jenny Johnson: We were all very excited about the Legg Mason announcement and what it meant for our respective companies, and of course thousands of employees, clients, and shareholders. For me personally, it served as big news to start off my tenure as CEO, but it was definitely a team effort. I had the benefit of still having the former CEO of Franklin Templeton as executive chairman and our CFO had experience with many transactions.

We had been working on the Legg Mason transaction for about eight months and I was very involved. It was part of a multiyear strategic plan where we identified key growth accelerators for our business. And when the pandemic hit, we never looked back. For us it was a growth story, from filling product gaps to providing client diversification to

acquiring new capabilities. In some situations, a CEO may face pressure from investors who look for short-term gains versus taking a long-term perspective, but we had the benefit of having long-term shareholders. I was more confident than ever about our future.

Robert Byrne: The merger closed earlier than many expected. How did you manage the integration?

Jenny Johnson: The integration was about laying out and communicating very clear goals, and we're proud of the progress we have made toward achieving them. One of the merger's goals was to infuse talent into the firm, and getting people to be open to that was really important.

When you are picking talent for new roles, you want to be able to do that in person and I was fortunate to have arranged a two-week trip to visit all of Legg Mason's investment boutiques that ended right before the lockdowns in March 2020. That made a huge difference because even that limited interaction helped build trust and move things along in the integration. In an acquisition, everybody is nervous about their future roles. As you get further up in the organization, there is only one seat for certain functions and in an acquisition of two equally sized firms, there are two candidates for many roles. In some cases, we didn't go with a Franklin Templeton candidate, and those were tough conversations.

Robert Byrne: Your father, former longtime CEO of Franklin Templeton, had said that Franklin does what's right for the client and the business takes care of itself. How did that philosophy inform your approach to client retention?

Jenny Johnson: The clients' primary concern was that the merger would be a distraction for us, so it was important for us to keep them informed about the progress. Early on, we developed a more adaptable regional distribution model which pushed decision making and resources closer to our clients to be more responsive to their needs. We also

invested significant time training our sales teams on the expanded range of capabilities. Once our clients were comfortable with the decisions we were making, they started to ask, “What else is available? Tell me how this is good for me.” We are seeing the benefits of cross-selling.

Naturally, we expected there would be some growing pains. We had to change the relationship managers for some clients, which is always hard for people. Half the financial advisers have a new wholesaler supporting them and it will take time for those relationships to be established.

Robert Byrne: How will you define and measure the merger’s success as you continue the integration?

Jenny Johnson: It’s many of the traditional measurements in the industry: Are we growing the business? Do we see positive net flows? Are our solutions teams sought after as advisers? And we are seeing positive developments, with organic growth in a number of key areas. With the recent announcement of the acquisition of Lexington Partners, we now have top-tier specialist investment managers in all the key alternative categories. When we close the Lexington transaction next year, we expect our alternative assets under management to approach \$200 billion. We also recently announced plans to acquire O’Shaughnessy Asset Management, which will complement our existing

strengths in separately managed accounts [SMAs] and customized solutions with the power of custom indexing.

These plus the Legg Mason acquisition have greatly expanded our ability to create new solutions—now it’s like being a chef walking into the best-stocked kitchen. Another area that’s exciting, but will take time to unlock, is the diverse expertise that specialist investment managers can learn from each other.

Robert Byrne: You opted to not fully integrate Legg Mason’s independent boutiques, aiming rather to create what you have described as a “cross-fertilization.” What impact does this decision have on the culture of the merged entity?

Jenny Johnson: Some of the Legg Mason investment teams are quite independent, and are fully functioning businesses with their own lawyers, CFOs, and other functions. As a global organization we can be helpful but rather than imposing this help on them, we let them opt in. Our philosophy has always been that the investment management teams are completely independent and the chief investment officer determines the investment process. At the same time, we have provided incentives to leaders of the investment teams to also focus on the success of the broader organization. A transaction gives you the flexibility to implement that, which would have been hard otherwise.

‘Investment bankers will tell you why a transaction is a great strategic fit and has a great price, but they will never talk about culture. Yet, in our experience, deals succeed or fail based on whether the cultures mesh.’

Remember that we were essentially buying nine cultures that we did not fully understand: the investment side had eight teams with unique cultures, plus the parent company. Investment bankers will tell you why a transaction is a great strategic fit and has a great price, but they will never talk about culture. Yet, in our experience, deals succeed or fail based on whether the cultures mesh.

Robert Byrne: Let's turn to broader industry trends. The impact of blockchain and the arrival of digital assets have long been topics of speculation. How disruptive will these changes be?

Jenny Johnson: Blockchain is the biggest disruption I have seen in my 30 years in this industry. Take, for instance, tokenization: an individual can build ownership rules into code that allow them to transfer illiquid assets much more easily. You can fractionalize ownership and then provide additional services through nonfungible token [NFT] validation. To put this concept into a real-world example, the Empire State Building could be sold to a million different people and those investors wouldn't need to do an ownership transfer; it's all there in that token.

This phenomenon will unlock and democratize assets in a way we have never seen. It will be fundamental to bringing alternative investments to the retail space, which needs to happen. The illiquidity premium has been so significant that it's dangerous for us as a society to only allow wealthy people to benefit from those returns. But it's a running-with-scissors scenario: NFTs are great tools but, boy, if used incorrectly, smaller investors could potentially get hurt.

The other concept I find fascinating is decentralized finance [DeFi]. Today, if I want to create a new company, I pitch it to friends, family, and venture capitalists and they become my equity providers before I launch the product. DeFi instead gives equity to the customers who help you build the business. When you become a user of my code, I can pay you in tokens that become valuable over time. This will change the traditional equity model, but we are only scratching the surface. It's like when

you got a smartphone and thought it was cool but did not appreciate its full capabilities. Now, you probably use it more than your computer.

Robert Byrne: Do you see asset managers being in the vanguard of bringing these innovations to the masses?

Jenny Johnson: Well, I don't know how many are paying attention. Franklin Templeton already has a money market fund built on blockchain. Many people think this is further off, but overnight it could coalesce. Is that two years from now? I don't know, but once it starts, it will take off.

Robert Byrne: Where do you see pockets of demand for alternative investments and will the distribution model change?

Jenny Johnson: Our clients deserve the broadest range of investment choice, and expanding into alternatives helps to provide all clients with access to performance and return drivers that differ from more traditional investments. For an asset manager, alternatives also provide for the potential of higher margins.

My team and I recently discussed some of the more complex issues that we as a manufacturer face in order to get private-market products to the hands of retail investors—whether through their financial professional or even inside a 401(k) plan. How do you value a private company daily? What about liquidity? Seventy-five years ago, Franklin got into mutual funds because back then the little guy didn't have access to the market. Mutual funds were hard to explain and took a long time to be embraced. It was 30-plus years before Franklin raised the first billion dollars, so firms have to be patient and committed.

Fast forward to today and we're seeing the same concept play out with alternatives. There is a massive amount of money available to keep companies private longer. Let's face it: when you go public, the scrutiny soars, so many companies prefer to wait. If that growth trajectory is not available to the retail investor, that will be a huge problem.

Robert Byrne: There has been an awakening in the past few years about corporations' responsibility to society. Do you think the focus on purpose, stakeholder capitalism, and environmental, social, and corporate governance [ESG] issues will persist, and what impact does that have for your industry?

Jenny Johnson: A leading publication did a CEO survey a year ago asking, "Is stakeholder capitalism new and here to stay?" And I was one of the few who said no. I said that because stakeholder capitalism has always existed. Good companies have always paid attention to their clients, their community, and their employees, who are your biggest assets. All those stakeholders have to be in the minds of successful leaders—it's certainly how my father ran the business. We are just doing a better job of articulating it today.

ESG and sustainable investing are also here to stay, and it's to the advantage of active managers because ESG data is hard to get, it's not consistent, and there is a lot of window dressing. I think we will see a shift to investment products that truly dig in to measure ESG performance. Clients will be asking, "How did I do in my returns and what impact did I have?" I have five kids and I see it with them: they are willing to be uncomfortable to save the environment. My daughter will not use a plastic water bottle; she will forgo water if that's the only option. This generation will demand that their managers go thoroughly through the data and measure the impact. People will smell it if you're not genuine.

Robert Byrne: Do you expect M&A to play a role in bringing some of the shifts you have been describing to the mainstream marketplace?

Jenny Johnson: First and foremost, I believe the next decade will not be dominated by passive investment management like the last decade was.

Passive tends to do well in a momentum market, but we cannot sustain the current level of central bank intervention and when that stops, there will be more differentiation in returns, which is where active management does better.

I also think data will be more and more important. Anybody making active decisions, whether at a macro or individual-company level, will be looking for nontraditional sources of data to gain an edge. That data is expensive because in data analysis there are far more dead ends than positive signals you can act on. Active asset managers will have to be as good as Google is at understanding how to get insights from data. Scale allows you to share those costs across a broader asset base and that will be one element that pushes M&A. Additionally, distribution partners worry about risk management, compliance, and technology investment. Investment companies will want to make sure that their partners are investing in those critical areas because if one of them sinks, it splashes back on them. That is another factor that will drive M&A.

Robert Byrne: You are now 20 months into your role as CEO. Is there anything you know now that you wish you knew when you started?

Jenny Johnson: Being willing to move people out of roles can be hard but very important. In basketball, if you have the point guard playing the center position, that person will not be effective, even if he or she is the greatest point guard ever. You need the right people in the right seats and a team that trusts each other.

Jenny Johnson is president and CEO of Franklin Templeton. **Robert Byrne** is a senior partner in McKinsey's Bay Area office.

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The state of diversity in global private markets: 2022

New research captures regional differences in the state of diversity in private equity and discusses the role of institutional investors as a catalyst for change.

This article is a collaborative effort by Pontus Averstad, David Baboolall, Alejandro Beltrán, Eitan Lefkowitz, Alexandra Nee, Gary Pinshaw, and David Quigley, representing views from McKinsey's Private Equity and Principal Investors Practice and Diversity, Equity, and Inclusion Service lines.



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Our new report, *The state of diversity in global Private Markets: 2022*, builds on prior McKinsey research on diversity in the workplace to explore diversity in the global private markets industry, with a focus on private equity (PE) firms and institutional investors (IIs). We surveyed 42 PE firms and IIs around the world and conducted interviews with several industry leaders to supplement the data we received back from these firms. Participating PE firms directly employ more than 60,000 people globally.

This report provides insights into three areas for the industry: a view of IIs' evaluation of diversity on investing deal teams today; II's preference toward more diverse deal teams when allocating capital to PE firms; and today's baseline of diversity for PE investing teams in terms of gender diversity for the Americas, Asia-Pacific (APAC), and Europe, and ethnic and racial diversity for the United States and Canada.

Key findings include:

- Chief investment officers (CIOs) of leading IIs said they would allocate twice as much capital to the more gender diverse PE firm if choosing between two otherwise comparable firms. More ethnically and racially diverse PE deal teams would receive 2.6 times as much capital.
- While 23 percent of all investing roles are held by women at PE firms globally, by the managing director level, only 12 percent are women.
- PE firms' employee diversity varies widely. At diversity leaders, 32 percent of MDs are women and 32 percent of MDs are ethnic and racial minorities. Diversity laggards have no women and 2 percent ethnic and racial minorities at the MD level.
- Geographic differences are also notable. PE offices in the Americas have the highest share of women in the C-suite and possibly the fewest obstacles to advancement for women; APAC leads the regions in investing women's representation in the middle of the corporate ladder; and Europe leads slightly at entry-level investing roles.

- Even when they make it to senior investing ranks, women and ethnic and racial minorities may still not hold the same position of power as their counterparts. PE investment committees (ICs) report 9 percent women globally and 9 percent ethnic and racial minorities in Canada and the United States—three to eight percentage points lower than their share of investing MD roles.

Given data collection limitations, this report remained largely focused on gender and ethnic or racial diversity within PE firms. We recognize there are several other categories that contribute to the diversity of employees. Future reports hope to broaden the categories examined, as well as expand to include PE firm Portfolio Companies, among other segments within private markets. The inaugural survey findings highlight the importance to IIs of having diverse talent in PE and the progress the PE industry has made over the course of 2021 (for more, see sidebar "Institutional investors in the private market ecosystem"). It also provides clear areas of focus as the industry continues to prioritize diversity, equity, and inclusion.

Institutional investors as catalysts for change

As key players in private markets, given the amount of capital IIs allocate annually to PE firms, IIs could be real catalysts for change on topics like diversity of talent in PE—if they decide this matters (for more on IIs, see sidebar "Institutional investors in the private market ecosystem").

Based on our study, it seems they do. IIs are increasingly asking for and receiving diversity data from PE firms seeking to raise funds. Moreover, once a PE firm begins to provide diversity data as part of fundraising, the firm is likely to continue providing diversity data for subsequent funds' capital raises. The director of environmental, social, and governance (ESG) of a US-headquartered PE firm said, "We used to get a lot more requests on emissions and environmental metrics than on diversity. But there has been an uptick in DE&I requests, and we share what we are doing, and talk about the initiatives we have in place."

Institutional investors in the private market ecosystem

“**Institutional investors**” is a broad term used to describe a range of types of companies that manage assets of groups, typically by allocating capital to various investment vehicles to grow value over time. Here we use the term IIs to include, but not limit to, state or local pensions (for example, for teachers or police), Sovereign Wealth Funds, Private Family Offices, Foundations, Endowments, Real Estate

funds, lenders, growth or expansion funds, hedge funds, and venture funds.

These IIs often directly allocate capital to various Private Equity companies when they are raising funds for a new tranche of investments. These Funds often have specific themes (for example, Buyout) and even at times a strategic focus (this could be based on industry or geography,

for instance) for the companies they will deploy this capital to.

Since PE funds raise significant capital from IIs, they are motivated to align their actions and strategies to IIs’ priorities, especially during capital raises. Data PE funds provide during fundraising can range from past funds’ performance to the talent composition of investment teams and firms’ ICs.

The main challenge for both the IIs and PE firms is a lack of standardized metrics, which makes the reporting process unwieldy and labor-intensive for PE firms. As the head of DE&I at a midsize US PE firm said, “I am a big proponent of the need to streamline and consolidate what we are asked to report. It is hard for organizations like ours to respond to so many requests for different data in different forms.”

Meanwhile, IIs are left to wade through a mix of data from multiple PE firms that is difficult to compare

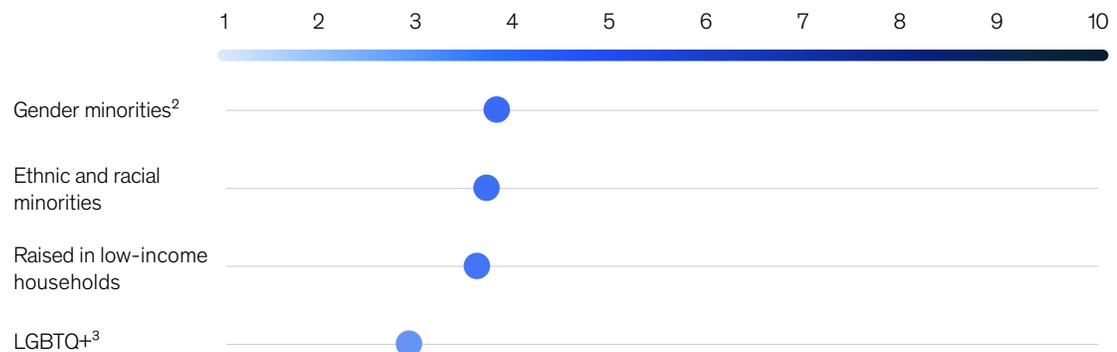
and therefore often not able to be used in allocation decision making.

The consensus among IIs that participated in our survey is that the state of diversity in PE today is poor. IIs believe that PE firms have significant opportunity to improve the representation of underrepresented groups on their investing teams, specifically on the dimensions of gender, ethnicity and race, socioeconomic background, and sexual orientation (Exhibit 1).

Exhibit 1

Institutional investors surveyed think private equity firms can be more diverse.

Institutional investor perception of representation of groups within the private equity deal team, by group,¹ average score of respondents, scale of 1–10



¹Question: “Thinking about private equity investment teams across the industry, how well do you feel that the following groups are represented?” Scale of 1–10, where 1 = not at all represented and 10 = very well represented.

²Gender minorities include women and nonbinary individuals.

³LGBTQ+ includes lesbian, gay, transgender, and queer individuals.

ILs signaled that PE firms could do more to diversify their ICs and the management teams at the helm of portfolio companies where they hold majority ownership (Exhibit 2).

Standardizing diversity metrics will take time. However, it is clear that ILs are increasingly considering PE investing teams' diversity in capital allocation decisions. Will Goodwin, Head of Direct Investments at New Zealand super fund said, "When we look to allocate, we ask PE funds for statistics on DE&I, such as gender pay gap and representation. In our opinion, programs, like parental leave, are just good hygiene and table stakes these days."

While the sample size of ILs was small, our data suggests that the diversity premium can be significant in some scenarios. Ten chief investment officers representing ILs with assets under management (AUM) ranging from \$20 billion to \$460 billion were asked to allocate a fixed amount of capital between two hypothetical PE funds. When two hypothetical PE firms had identical

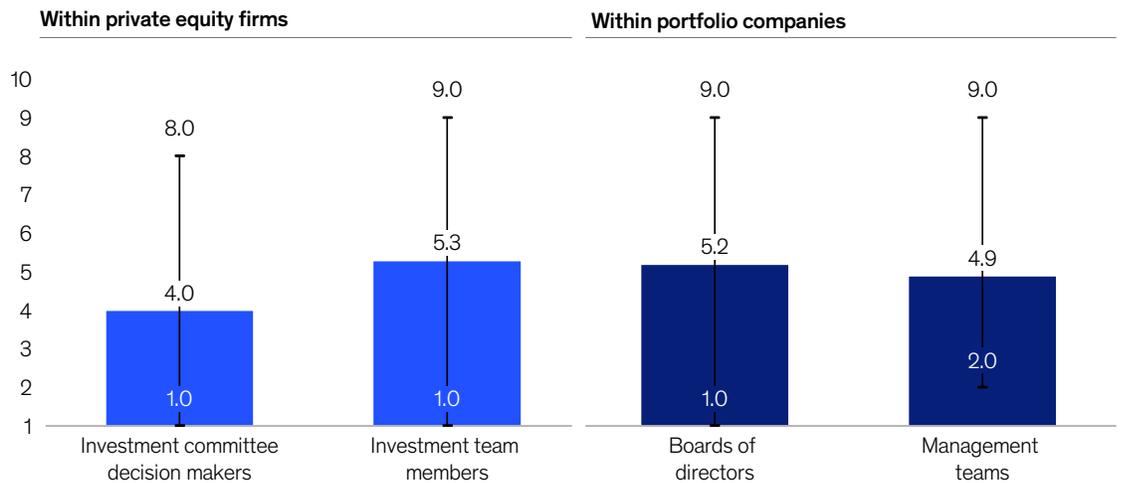
metrics except for the investing team's diversity, on average, ILs would allocate twice as much capital to the deal team with more gender diversity and 2.6 times as much to the team with more ethnic and racial diversity. Not only would the more diverse deal team receive more money, all else equal, the data suggested there may be a penalty for PE firms that lag peers on diverse talent: one IL reported that they would not allocate any funding to the less diverse PE fund when the alternate funds' historical performance was the same.

Surprisingly, in a scenario where the diversity leader lagged on historic performance rate, 40 percent of ILs still allocated more capital to the PE firm with greater gender diversity, in spite of its lower historic returns; 50 percent of ILs allocated more to the firm with lower historic returns but higher ethnic and racial diversity. Given the challenges of gathering data and comparing apples-to-apples metrics from all firms, it is too soon to quantify the extent to which this is occurring today in ILs' actual allocating. However, responses from surveyed ILs

Exhibit 2

Institutional investors' views vary on how satisfied they are with the actions PE firms are taking to improve their diversity and the diversity of their portfolio companies.

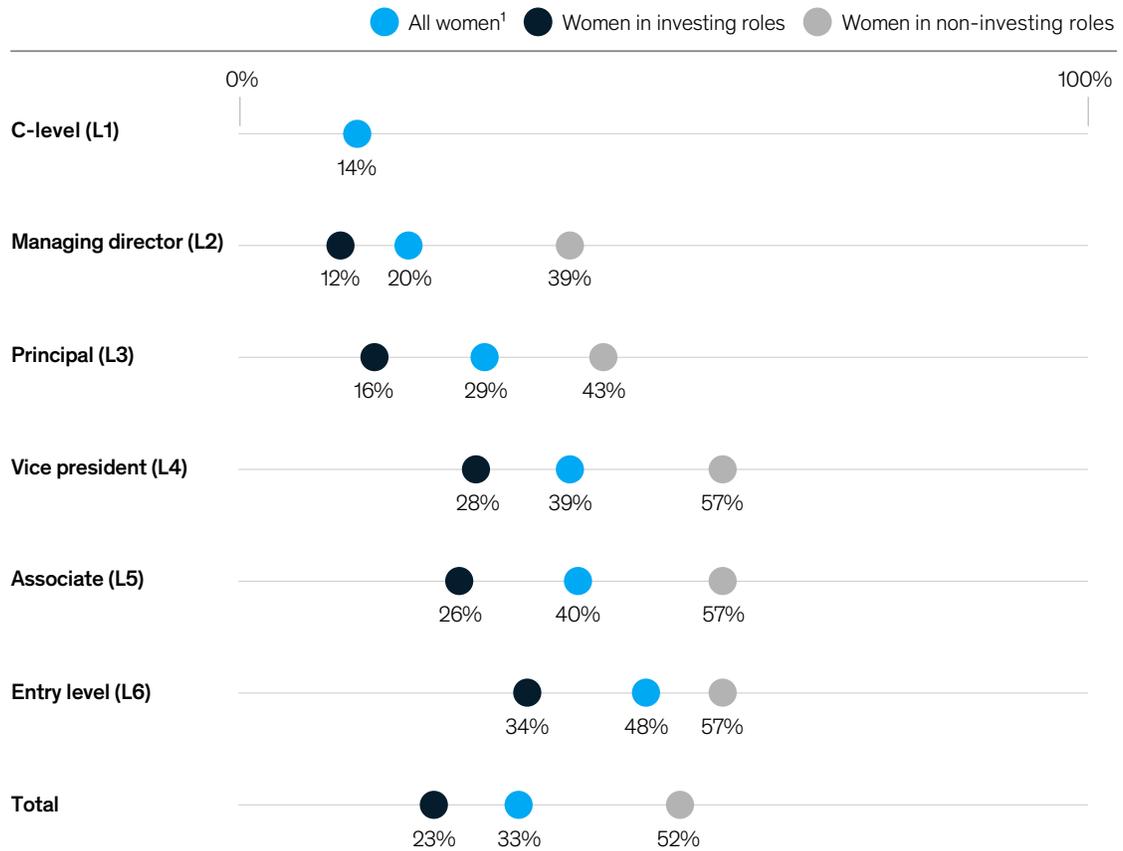
Institutional investor satisfaction with actions taken by private equity firms to improve diversity, by group,¹ average score of respondents, scale of 1–10



¹On a scale from 1-10, 1 = highly dissatisfied and 10 = highly satisfied.

Exhibit 3

Women are more represented in non-investing roles at every level.



¹Based on data provided by 31 private equity firms. Responses cover more than 11,000 employees. Unique firm count by region: Americas = 26; Europe = 16; Asia-Pacific = 11.

suggest that diversity does matter to these firms, and a willingness to allocate accordingly exists if the comparative diversity data and historic fund performance is provided by PE firms.

Gender diversity in global private equity

Globally, PE firms have almost achieved gender parity in entry-level roles. As of year-end 2021, 48 percent of all entry-level roles in PE globally are filled by women (for more on job levels, see sidebar “Job levels in private equity”). However, disaggregating this figure into investing and non-investing employees reveals only 34 percent of entry-level investing roles are held by women, compared to 57 percent in non-investing entry-level roles (Exhibit 3).

Women in PE continue to experience obstacles to their career advancement. The share of minorities (on the dimensions of gender, ethnicity/race, or an intersection) within PE Investing teams often declines with seniority. One consequential result is that even senior women struggle to break into “the room where it happens” in PE: today, women make up only 9 percent of IC members despite comprising about 12 percent of managing director-level investment staff (L2) and 14 percent of C-suite roles (L1) (Exhibit 4). (For more on the role of ICs, see sidebar “The role of investment committees in the private equity industry.”)

The fact that women’s representation on ICs is lower than their presence in these senior ranks (ie, L1 and L2) may reveal an unspoken cultural dynamic

Job levels in private equity

We classify jobs in private equity into six levels. For most of these levels, we include multiple possible job titles. In descending order of seniority, the roles are:

L1. C-level executives and fund heads. We will be referring to this level as the C-level.

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

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

L4. Vice presidents and senior managers. We refer to these jobs as VPs.

L5. Associates and managers. We refer to these as associates.

L6. Entry level.

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

Exhibit 4

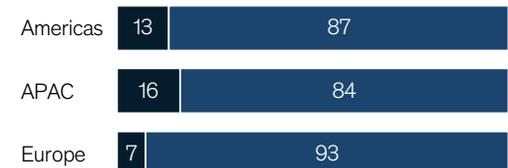
Women comprise 9 percent of investment committees globally.

■ Women ■ Men ■ Women in investing roles ■ Men in investing roles

Global talent pipeline for higher-level roles,¹
share by gender and by level, %



Global talent pipeline for higher-level roles by region,²
share by gender and by level, %



¹Based on data provided by 31 private equity firms. Responses cover more than 11,000 employees. Unique firm count by region: Americas = 26; Europe = 16; Asia-Pacific = 11.

²Asia-Pacific investment committee and C-suite details unavailable due to insufficient number of organizations reporting data for investment committee and C-suite.

in which women are still not in the same positions of power as 91 percent of their male counterparts, even at the MD or C-suite levels.

Globally, gender diversity in investing, particularly at the senior levels of PE firms, has a ways to go. Yet even today there is a significant spread among PE firms that lead on gender diversity and those that trail. When looking at the MD level (L2), the top 10 percent of PE firms on gender diversity average 32 percent investing women MDs, while the bottom 10 percent of firms in 2021 had zero investing women MDs. What’s more, women’s representation at the top seems to impact gender diversity throughout the organization: PE firms that lead on percent of women MDs also had significantly higher shares of total investing women versus the industry as a whole—a difference of 10 percentage points higher

compared to the industry average of 23 percent (Exhibit 5).

Regional differences in gender diversity

The dynamics of the PE industry as a whole may affect the number of women in investing. However, regional variations also exist (Exhibit 6).

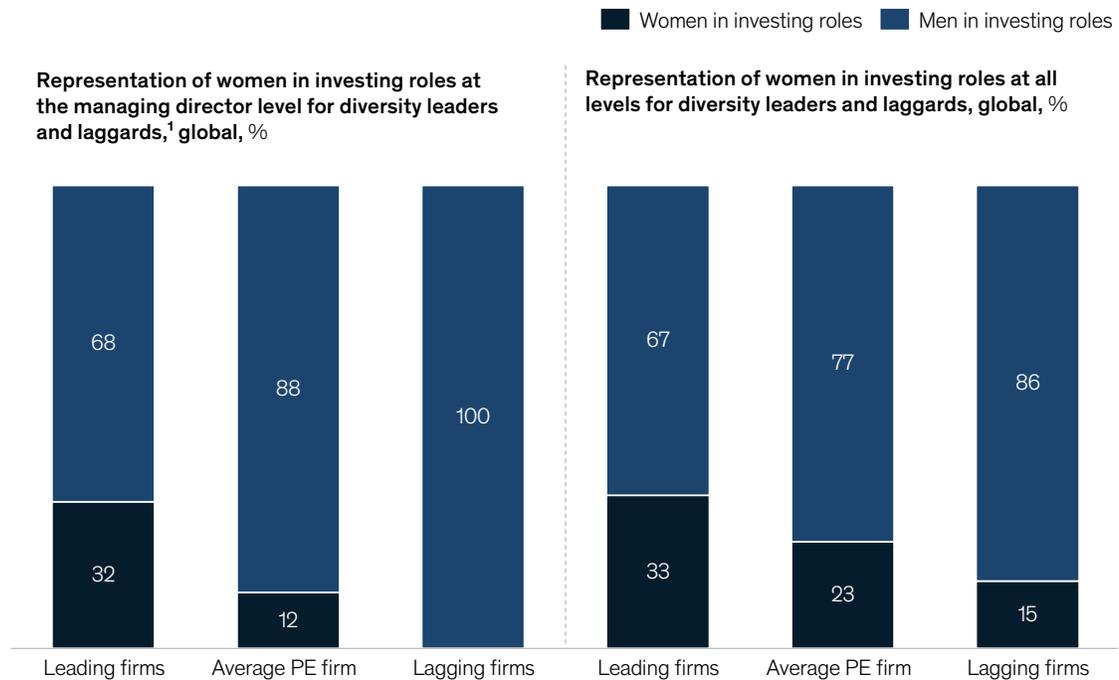
These regional differences impact different levels within the PE hierarchy.

PE offices in the Americas have low share of women in entry- and associate-level investing roles

PE offices in the Americas have the highest share of women in the C-suite and possibly the least obstacles to female advancement, with the smallest drop-off in share of women from associate (L5) to MD (L2); APAC leads the regions in women’s

Exhibit 5

Globally, private equity firms that lead on diversity at the managing director (L2) level also beat the industry benchmark for all investing roles.



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

*"Diversity leader" is defined as the top 10% of PE firms by representation of women in investing roles at the managing director level (L2) globally. "Diversity laggard" is defined as the bottom 10% of PE firms by representation of women in investing roles at the L2 level globally.

Exhibit 6

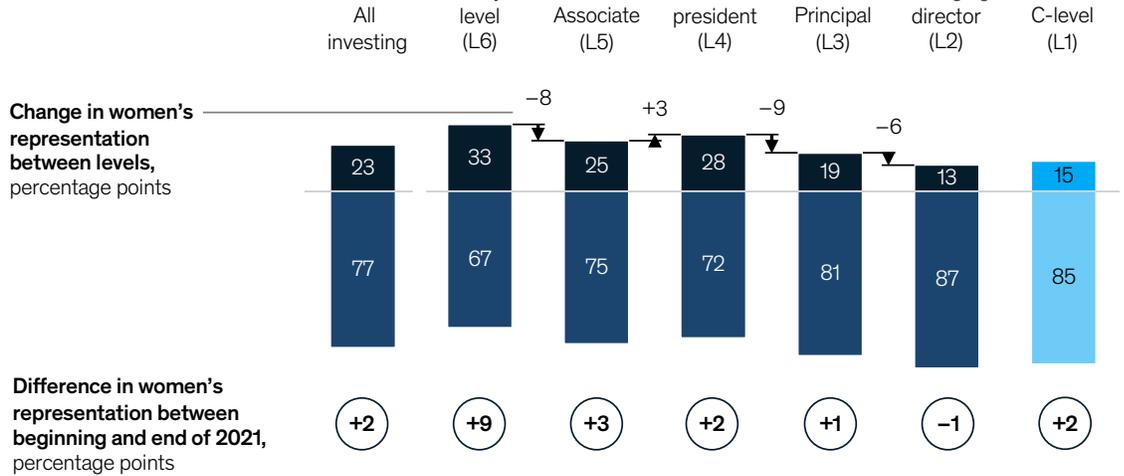
Gender diversity in private equity varies by region.

Private equity talent pipeline by gender,

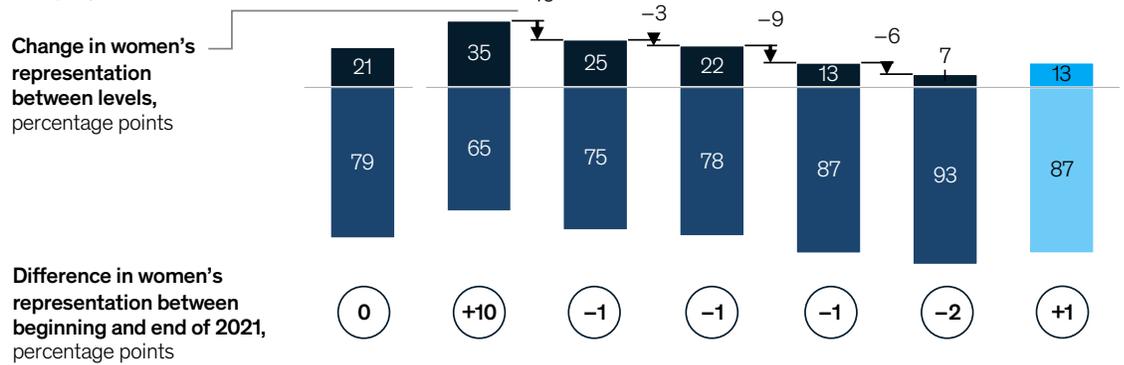
share of women and men in investing roles by level, %¹

■ Women
 ■ Women in investing roles
■ Men
 ■ Men in investing roles

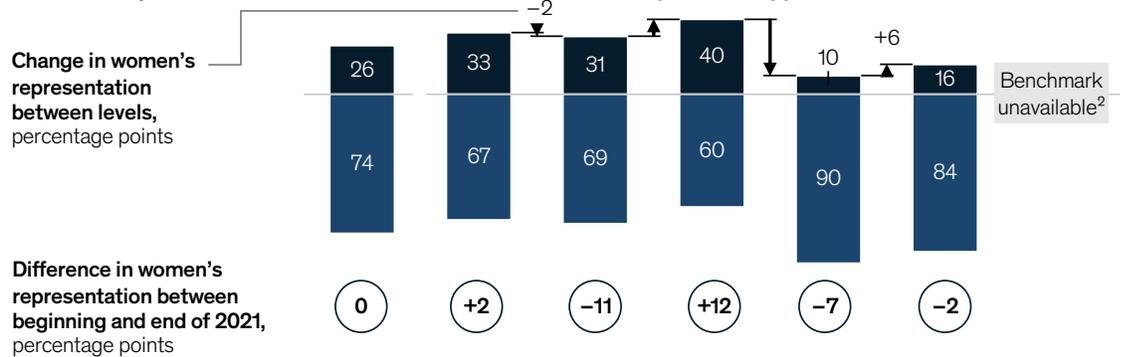
Americas, year-end, %



Europe, year-end, %



Asia-Pacific, year-end, %



¹Based on data provided by 31 private equity firms. Responses cover more than 11,000 employees. Unique firm count by region: Americas = 26; Europe = 16; Asia-Pacific = 11.

²Benchmark data not available due to low number of reporting companies.

representation in the middle of the corporate ladder (L5 and L4); and Europe leads slightly at entry-level investing roles (L6).

Offices in the Americas boast the highest share of women in top-of-the-house roles: the share of women in the equivalent of the C-suite is 15 percent. Moreover, of the regions, offices in the Americas have the smallest drop today (12 percentage points) between the share of women in Investing at the associate level (L5, at 25 percent) and the MD level (L2, at 13 percent). However, the region also ties with APAC for lowest share of women at the entry level (L6) and Europe for lowest share at post-MBA associate (L5) level. While American PE does comparatively well with retention and promotion of Investing women, this small base of women entering the profession may constrain progress in the ability to advance a greater share of women to MD over time.

APAC offices have the highest share of women at the mid-level

APAC leads the regions in share of women investors at post-MBA associate (L5) and VP (L4) ranks. Representation for women at the associate level (L5) in APAC offices is 31 percent, five percentage points higher than the global benchmark; and representation for women at the VP level (L4) is 40 percent, 11 percentage points higher than the global benchmark. However, 2021 data shows a “broken rung” in the career progression for women

in APAC offices, as the share of women plunges by more than 30 percentage points in the step up from VP (L4) to principal (L3); that is a 4.2x drop in the percentage of women advancing to principal (L3) in APAC offices. This broken rung for women from VP to principal was made more severe by a promotion gap between women and men (2 percent women vs 20 percent men from the available pool promoted) in 2021 and attrition of women at the L3 level in APAC.

European offices have the highest share of women at entry-level Investing

Europe leads the regions, though marginally, in women entering in entry-level Investing jobs, with 35 percent. However, women in Europe at the MD (L2) level have the lowest representation—7 percent—compared to all other regions and the steepest decline from post-MBA associate level, with a 17-percentage point drop from L5 to L2. Given more than a third of entry-level investing staff are women, European PE offices have a real opportunity to improve their gender diversity at the higher ranks by evaluating sponsorship throughout the funnel and promotion rates of women out of the entry-level Investing role. However, there are positive signs. In 2021, Europe has the smallest gap compared to other regions between promotion rates for men and women at the mid-level to senior ranks. Even though promotions still favor men, in Europe, the difference in promotion rates between men and women into VP and principal is less than four percentage points.

The role of investment committees in the private equity industry

In private equity (PE), ICs are where investment decisions happen. Firms often take pride in their IC process. The intellectual debate and discussions that occur over potential assets to purchase, prices to pay, the level of EBITDA growth needed over the holding period, and how to create that value, all are raised and decided in ICs.

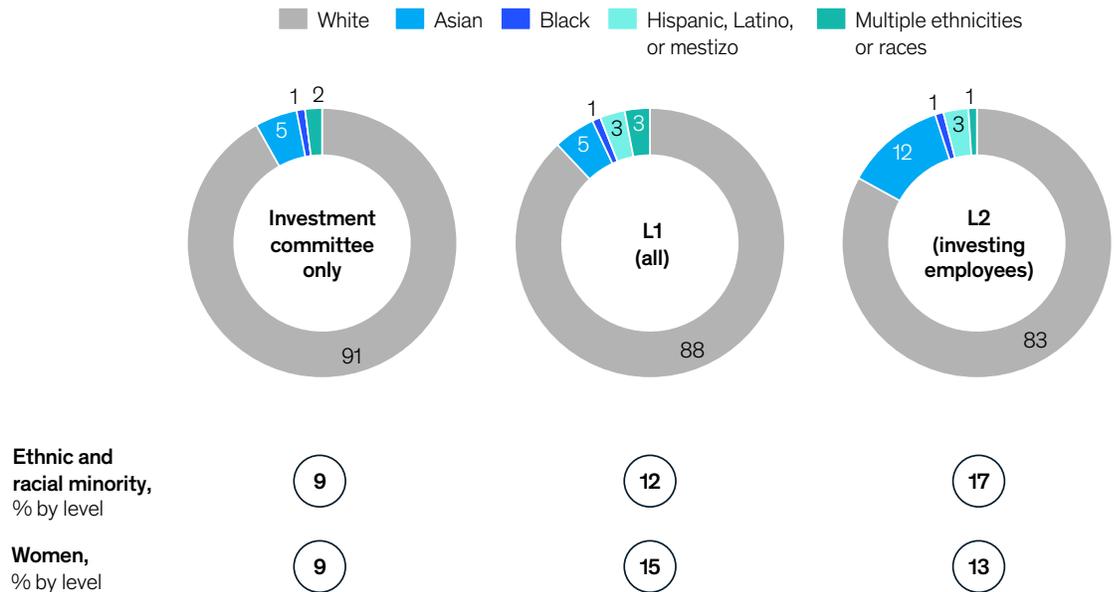
While several other operations—such as raising new funds or setting their investment strategies—are of comparable importance, the discussions and decisions made in regular IC meetings form the intellectual backbone of PE firms. Therefore, who consistently sits at the IC table matters.

Standing IC members are generally invited from the C-Suite (L1) and MD (L2) ranks.

Exhibit 7

People from ethnic and racial minority groups are less represented at the top levels in private equity.

Representation of ethnic and racial minority employees in Canada and the United States,¹
by ethnicity and race, % by level



Note: Figures may not sum to 100% because of rounding.
¹Based on data from 24 firms. Responses cover about 7,500 employees in Canada and the United States.

Successes and challenges for ethnic and racial minorities echo those facing women

Based on data from PE firms' US and Canadian offices, like women, ethnic and racial minorities only make up 9 percent of IC members even though they make up almost 17 percent of Investing MDs (L2) (Exhibit 7).

White or Caucasian (hereafter "White") professionals remain the largest group in Investing roles in Canada and the United States. They hold 70 percent of all investing jobs, with White men being more than eight times as likely as White women to be MD (L2).

People of Asian descent (hereafter "Asian professionals") are the largest racial minority group in PE Investing roles. They hold 28 percent of these Investing roles at the associate level. However, the share of Asian investing professionals declines to 12 percent at the MD level. Asians' share of investing

roles remains around or above 22 percent until it drops seven percentage points from the VP (L4) into the principal level (L3)—and even further thereafter to 12 percent of MDs and 5 percent at the C-suite level. It also should be noted that Asians are the only ethnic and racial minority whose share of roles declines substantially from L2 to L1—as White, Black, and Hispanic/Latino/Mestizo (hereafter "Hispanic") representation increases or remains relatively constant from the MD to C-suite levels.

On the surface, Black and Hispanic professionals have similarly low representation across all levels of PE investing, starting at 4 to 7 percent of the entry and post-MBA associate levels. Both groups also lose roughly three to four percentage points from post-MBA to MD levels (L5 to L2). With 3 percent Hispanic and 1 percent Black principals (L3), PE lacks Hispanic or Black role models in the leadership ranks for more junior professionals. One

chief human resources officer (CHRO) commented, “If I were a Black person looking at PE, I don’t think I would see a lot of people who look like me, and I don’t know if I would want to work there.” Despite the low numbers of Hispanic and Black principals, each group retains the small share through the top leadership ranks, with 3 percent and 1 percent of leaders, respectively, in MD and C-suite roles. However, looking more closely at the trends, there are some differences in the Black and Hispanic experience in PE.

Black professionals comprise 7 percent of entry-level Investing roles, close to double the share of Hispanic professionals. This number drops sharply to 4 percent for the associate (L5) class in the US and Canadian PE offices. Black gender composition seems to mimic the overall PE Investing gender story only at the post MBA and VP levels, where Black women are just under a third of all Black Investing professionals. As of the end of 2021, only 1 percent of all PE MDs (L2) in these offices were Black, significantly lacking representation from Black women. That share of Black women does increase slightly in the C-suite—though Black representation (men and women) is still only a little over 1 percent of all US and Canadian reporting firms.

The Hispanic experience in PE Investing also begins with low representation in entry-level investing roles, at 4 percent. However, unlike Black professionals, this number grows to 7 percent at the post-MBA associate (L5) rank. Thereafter, there is more Hispanic talent compared to Black talent at senior levels of PE firms, with 2.5 times and 3.9 times as many Hispanic principals and MDs, respectively. And yet, despite comprising 3 percent of MD and C-suite roles, Hispanic representation on ICs was less than 1 percent. The gender imbalance for Hispanic professionals in PE Investing is larger than it is for Black professionals: Hispanic women only comprise about 16 percent of Hispanic professionals from post-MBA to principal (L5 to L3), dropping by nine percentage points to 7 percent of all Hispanic MDs. While it is clear that PE firms could work on attracting Hispanic and Black professionals, the data shows there is the most room to improve in attracting post-MBA Hispanic women, in

particular; firms are also falling short in retention and promotion of Black and Hispanic women at the principal and MD levels.

However, this analysis speaks to the industry averages on ethnicity and race in Canada and the United States. Of course, there is a spectrum of PE firms, with the top firms close to doubling the industry average share of ethnic and racial minorities at the MD level, with 32 percent, while more than 98 percent of MDs at the least diverse firms are White/Caucasian. As we saw with gender, diversity at the top does have an impact on the ability to retain diverse talent throughout the deal team (Exhibit 8).

While the industry average was 30 percent people from ethnic and racial minorities, industry laggards on MD-level ethnic and racial diversity were, on average, eight percentage points below industry average, at 22 percent ethnic and racial minorities across their entire investing team.

The path forward

Our findings suggest a few critical areas for leaders who want to make progress toward diversifying the industry:

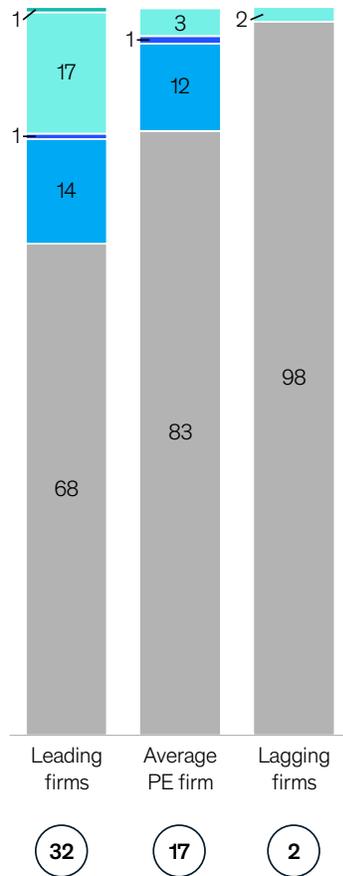
1. **Evaluate IC diversity.** PE firms should take a critical lens to the diversity of their ICs to understand if and why they are not more reflective of the makeup of their C-Suite and managing directors.
2. **Consider region-specific obstacles to diversity:**
 - *Offices in the Americas could strive for gender parity* in hiring and attract more Black and Hispanic talent for post-MBA investing positions. PE firms may need to take a critical look at possible causes, such as barriers to entry or an unattractive culture, that results in low levels of representation of Black and Hispanic professionals even at entry levels of firms’ deal teams. For the current talent pool, firms could continue to improve promotion parity of women, Asian professionals, and Hispanics professionals into VP, principal, and MD roles.

Exhibit 8

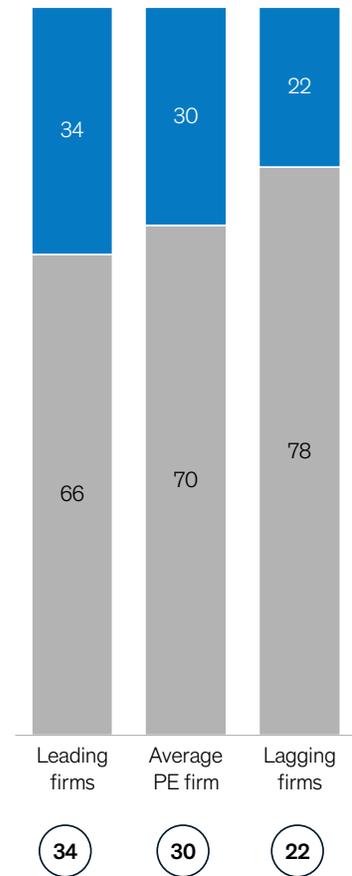
In Canada and the United States, private equity firms that lead on ethnic and racial diversity in L2 roles also beat the industry benchmark for all investing roles.

White or Caucasian
 Asian
 Black
 Hispanic, Latino, or mestizo
 Multiple ethnicities or races
 Ethnic and racial minority

Ethnic and racial minorities in managing director roles in private equity (PE) firms, %¹



Ethnic and racial minorities in entry-level to managing director roles, %¹



Ethnic and racial minorities, %¹

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

¹Based on data provided by 24 private equity firms in Canada and the United States. Responses cover about 7,500 employees; leading firms are the top 12.5% of companies on % of ethnic and racial minorities (including people of Asian descent) in managing director roles, and lagging firms are the bottom 12.5% of companies on % of the metric. Average PE firm is the average of the entire data set.

- *APAC offices can mend the broken rung* from VP to principal by evaluating barriers to apprenticeship, sponsorship, and promotion of women, as well as by working to reduce MD and principal female attrition.
- *European offices may reduce the loss of women* from L5 to L2 and leverage the

breadth of their women colleagues at L6, by striving for promotion parity for that first step up from entry level to associate level, as well as in external hiring for mid-tenure levels (L5 to L3). Finally, examining the office culture with an eye towards potentially improving retention of Investing women.

3. **Gather more intersectional diversity data.** PE firms' CHROs and Heads of DEI should push to improve the granularity of the data collected around the world, where possible, and devise solutions with these intersectional groups in mind.
4. **ILs can use standardized—and simplified—diversity metrics to evaluate PE funds.** This will likely require collaboration among ILs. Furthermore, if not already asking, ILs should consistently require diversity metrics from all PE firms that approach them during fundraising.

Increasing the diversity of PE Investing teams takes time. While there are no quick fixes, the value to be gained by taking effective action could motivate sustained focus on the goal. Creating an equitable and inclusive culture will be the key to retaining a diverse workforce over time. The Head of HR for a European firm shared, "By humanizing the culture a bit more, we will be able to make private equity firms a place to spend a career for reasons beyond just money. By doing that, you may automatically get more diverse talent, including at the most senior levels."

Jerilyn Castillo McAniff, Head of D&I at Oaktree Capital Management, L.P., a global investment manager specializing in alternative investments, said, "What we need are consistent metrics and industry benchmarks so that firms can track representation and progress. Without these tools, we all operate in a vacuum. We can all do our part by participating in relevant industry studies and benchmarks, which gather data, track trends, and highlight key themes. Making progress will be a collective effort."

Building a more diverse set of leaders at the helm of the private markets industry requires sustained, nuanced, long-term effort. However, this research shows that progress is being intentionally made across several PE firms; and rewards come with that diversity, as ILs continue to prioritize and seek diverse talent to allocate their money to.

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The authors wish to thank Kyleb Bello, Clay Bischoff, Erin Blank, Judy D'Agostino, Chelsea Doub, Alistair Duncan, Diana Ellsworth, Carlos Esber, Catherine Falls, James Gannon, Amit Garg, Chris Gorman, Wesley Hayes, Sara Hudson, Claudy Jules, Drew Knapp, Connor Kramer, Alexis Krivkovich, Ju-Hon Kwek, Bola Lawrence, Robin Lore, Andrew Mullin, Surya Narayan, Margret-Ann Natsis, Hilary Nguyen, Vivek Pandit, Ashley Pitt, Ishanaa Rambachan, Nicole Robinson, Elise Sauve, Jennifer Schmidt, Jeanette Stock, Monne Williams, Jackie Wong, Lareina Yee, and all the participating private markets firms for their contributions to this report.

We are appreciative of McKinsey and LeanIn.org's Women in the Workplace study, which has informed the creation of this work.

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‘If you’re going to build something from scratch, this might be as good a time as in a decade’

In an interview with the editorial director of the *McKinsey Quarterly*, venture capitalist Bill Gurley explains the promise and perils facing start-ups at a moment of economic uncertainty and reveals why hybrid work may be the most interesting technology of all.”



Bill Gurley is one of Silicon Valley's most respected venture capitalists. As a general partner at Benchmark, Gurley has backed a blessing of unicorns, including Grubhub, Liveops, Nextdoor, OpenTable, and, most famously, Uber.

Gurley has often been a voice of reason amid Silicon Valley overexuberance and has tweeted regularly in 2022 about the need for start-ups to be realistic about the current economic environment. While many venture firms have a lot of money to invest, dealmaking has slowed considerably this year. Average valuations of some fundraising rounds have dropped as investors adjust to an economic slowdown and look warily ahead. But being realistic doesn't necessarily mean being pessimistic: in some ways, says Gurley, this may be a great time to launch a start-up. Gurley recently joined *Quarterly* editorial director Rick Tetzeli for a wide-ranging discussion. An edited version of their conversation follows.

Rick Tetzeli: Thanks so much for joining me to talk about start-ups at what seems to be a particularly challenging moment. As if to prove the point, an alert just popped up on my screen: Robinhood is laying off 23 percent of its workforce.

Bill Gurley: Wow. Layoffs happen so infrequently. In '01 and '09, you had broadscale layoffs, but only now are we starting to see them this time around. Well, 23 percent is getting into a range that actually makes sense. Is this their second layoff?

Rick Tetzeli: Yes, unfortunately. They did 9 percent earlier.

Bill Gurley: See, that's the thing. I hate the 5 to 10 percent layoffs. You don't get any material impact to lowering your expenses. Yet you get all the cultural negatives of having done a layoff. You get 100 percent of the pain and very little gain. And then you're in retweet land—you end up with two or three of them. Anyway, that wasn't on your original list of questions.

Rick Tetzeli: No, it's not. It just happened. But it's a bracing lead-in to talking about how difficult things might be for start-ups during what seems to be a

time of great uncertainty. Many people feel that the externalities affecting so many businesses—whether it's the war in Ukraine, inflation, geopolitics, changing labor patterns—seem more complicated now than they have been in a long time. Do you agree with that? Do you think we're entering a period of extended uncertainty?

Bill Gurley: It's funny. Three or four years ago, I felt, like many others, that the really big problem was the zero-interest-rate thing, this prolonged period of near-zero interest rates. I even paid a massive amount of money to end up at this dinner with Warren Buffett, where we each got to ask him one question. My question was, "You know, if interest rates are zero, (1) your DCF model [which emphasizes discounted cash flow as the basis of valuations] doesn't work, and (2) it drives all kind of speculation." And he said, "You betcha!"

I also spent time tracking down Howard Marks and Stanley Druckenmiller because I think there are so few people who have proven that they have a valuable point of view on macro. There are just so many variables with macro. You can fool yourself. I've felt that ever since my MBA macro class.

So I'm hesitant to answer your question. That said, clearly you've had rates going up, which hasn't happened in a very long time. That has had consequences on car loans and mortgages and corporate debt. And it should rein in speculation—it probably has already. China decoupling from the West is pretty scary, given that sharing and trading has a positive impact for both societies. If that were to escalate simultaneously with, say, Europe getting worse and maybe something in Taiwan being provoked, that could all be super bad.

Having said all that, I have two things in the back of my mind that relate to start-ups and the start-up ecosystem.

First, Stephen Covey used to talk about your circle of influence, and Buffett talks about your circle of competence. Macro things are not things that start-ups can impact or control. So there's not much reason for them to affect your thoughts about

whether you would start a company or not. They might add anxiety, but I don't know that they have any real impact.

Rick Tetzeli: Because it's still about the idea. And the idea is good regardless.

Bill Gurley: Right. Second, the environment for launching a start-up was really crazy the past five years. And the truth is that if you're going to build something from scratch, this might be as good a time as you've had in a decade.

Real estate? You can get all the real estate you want. People used to fret about lease cost, but that's all gone. And while people get caught up on whether the money's cheap or not, getting rid of the distraction of all that cheap money may be a good thing. That whole mentality of, oh, your competitor raised \$100 million, now you have to raise \$100 million. All those things have evaporated—for the better, I'd say.

A huge thing is that your access to talent is way better. It was so hard to get, but now it's a lot cheaper than it was. There are layoffs happening. And then hybrid has opened up the people you can get. I've heard some pretty amazing stories. Jennifer Tejada, who runs PagerDuty, says they went into the pandemic at 85 percent Bay Area employees and came out at 25 percent. If you need an iOS programmer within 20 miles of your Silicon Valley location, that's way harder than if you can shop globally for that.

Rick Tetzeli: Let's stick with hybrid for a second. Do you think it will affect the culture of start-ups?

Bill Gurley: Whether hybrid is good or bad is one of the biggest unknowns coming out of the pandemic. There are some pretty hard-core enterprise-type founders who say, "Everyone's back in the office." And then there are people whose business is positively impacted by hybrid work. It's all over the map. I remember asking [Matt Mullenweg,] the CEO of WordPress, which has been 100 percent hybrid

its whole life, about this before the pandemic. And he said that you need to be all or nothing, that when you're in the middle ground you get into these weird cases of cultural confusion, where, for example, cliques can develop if someone's not there. That's why some people have a rule: all in person or no one in person. But I don't know what makes sense.

The number-one thing people at start-ups worry about is missing out on serendipity—just some random conversation between two people who were out visiting a customer and then said, "Oh, wait, what if we did this?" and it becomes critical to the company's success. That's far more likely in a start-up than in a big company. But, ultimately, hybrid is really a founder-centric decision.

Rick Tetzeli: The pace of IPOs has slowed enormously this year, and valuations have collapsed. Earlier this year, you tweeted, "An entire generation of entrepreneurs and tech investors built their perspective on valuations during the second half of an amazing bull market run. The 'unlearning' process could be painful, surprising, and unsettling to many."¹ Is this a reset like 2001 and 2008–09? How painful might it be? And have you learned things from the past downturns that apply here?

Bill Gurley: This one is different in a couple of ways. In 2001, there were a lot of nascent companies going public with, like, \$1 million in revenue. That's not the case this time around. Here, you've had a lot of companies with huge amounts of revenue, some with massive losses. There has been a huge volume of capital, and the scale of the companies is radically different. Some have raised \$500 billion, \$3 billion—there was no precedent for sums like that. And some of that money might be dead money.

Then there's the fact that this run went on longer than people thought. That may well make the pain a little bit bigger. It also means that there's less institutional memory.

The collective venture community needs to get its head around the new reality as fast as possible. The

¹ Bill Gurley (@bgurley), Twitter, April 29, 2022, 1:44 p.m.

more people see what's really going on, the quicker that will happen. In '09, the response to the downturn was pretty swift. But you had the benefit that '01 was only seven or eight years in the rearview mirror. While there's still some institutional memory around the Valley, it's been a very long time since 2009.

Rick Tetzeli: So what are you telling your portfolio companies?

Bill Gurley: I try to convey that they need to get in front of this. In a couple meetings, I've heard an owner or founder say, "Well, you know, we just need to buckle down until things get back to where they were." And I'm, like, "No, the fantasy was the past five years."

What we're in now may just be normal, right? This may be average. And that's very hard for people. It's especially hard for a founder.

This will sound trite, but a founder who, say, owns 15 percent of a company that raised a round at \$1 billion has done the math. They've mentally banked that they're worth \$150 million—pretax, of course, but they forget that. But now, they're not! And it's just super hard for them to accept that that was from a fantastical time that's probably behind us.

Rick Tetzeli: So how does that personal shock of going from being worth \$150 million to being worth \$50 million—

Bill Gurley: Or \$15 million—

Rick Tetzeli: How does that affect how they manage?

Bill Gurley: Well, if they're in denial they can make a lot of mistakes. They don't cut enough cost. They don't lay off enough people. They continue to think they can just go raise money, but they don't realize their cost of capital has changed by 5x. If they do not fully understand the situation they're in, that's super problematic.

You have to play the game on the field. If everything has reset, it has reset. The sooner you get in touch

with that, the better you'll do. That's just pragmatic. This goes back to the very first topic we talked about, layoffs. If you're going to do it, how material does it need to be?

Rick Tetzeli: Layoffs, of course, can be particularly tough on a company. Don't you ever worry that people could cut too aggressively at this point?

Bill Gurley: I've never seen that in my history. Everybody says, "We're getting to the bone." Everyone says that. And I know it's a touchy subject because people are losing their jobs. But companies—even small start-ups—are way more resilient than people realize. It's the norm that you cut 30 percent, and everything keeps going. You don't lose all your customers. And some people find, "Oh, wait, we're moving a little faster." Sometimes things get better. I mean, yes, eventually some companies go bankrupt. But I've never seen someone do too much. You can always hire back. I think 95 percent of the time, the failure is the other way, of not doing enough.

Rick Tetzeli: You've tweeted that "Benchmark never changes our investment cycle due to economic swings."² Why?

Bill Gurley: Well, our firm has a very unique focus. Around 85 to 90 percent of our funds are deployed on first-money and early-stage investments. And our approach has become even more unique because so many of our competitors have gone multistage.

And once you start doing late-stage things, the current environment has a drastic impact. But if you're doing early-stage, these kinds of swings don't really put you off the next incremental investment. There have been plenty of great companies started in the troughs to suggest that there's no reason to stop investing.

The same thing is true at the peaks. There were firms that pulled out in '96 because they thought things had expanded too broadly, and they missed three of the greatest years of returns in the history of the business.

² Bill Gurley (@bgurley), Twitter, June 20, 2022, 6:15 p.m.

We really try to learn from our mistakes. We tried to expand internationally once, but it didn't work for us. So in about 2006, 2007, we capitulated and went back. And our conviction in our focus was even stronger, because we saw that we did better work once we refocused.

We had that on our mind as everyone in the Valley started expanding in more recent times. And I will tell you, for the six or seven years prior to the past year, people would meet with us and tell us that we were stupid, that we were leaving money on the table. But in the past six months, that's all reverted. Now it's all, oh, you guys are still brilliant.

There is another reason why I like our model. We're running much smaller funds than some of our peers, who probably pull down ten times the capital we do each year. Those firms have massive management fees as a result. As an investor, I just take more pride in us doing well when our limited partners are doing well. So if the majority of our compensation is on the carry side instead of the fee side, I just feel better about it.

Rick Tetzeli: Are companies still coming to you seeking frothy valuations, or has that changed from a year ago?

Bill Gurley: I think we're partially corrected. It takes a while for people to come around to the fact that everything's been reset. It's a slow process. It's also why M&A is delayed. People think, "Oh, everything's peaked," so M&A should just take off now. But like founders with valuations, late-stage investors that invested at a certain number aren't going to like it if you try and sell the company at a third of the price they paid. So things are slow to get corrected.

Rick Tetzeli: You've been pushing for direct listings and other nontraditional ways of going public. Do you think that has become a fully accepted part of the game? Do you think these methods will become even more customary going forward?

Bill Gurley: I hope so. Both the NYSE and the Nasdaq have been approved for direct listings with a set of parameters that are still being worked on. But

with the market resetting, I don't think this is on the SEC's [US Securities and Exchange Commission] priority list. They've got other issues at the forefront.

There is definitely a category of founders who have the financial knowledge of how markets work and how markets should work that prefer it. They know that it's ridiculous that a human would pick the price and the allocation when an algorithm can do it in an auction. I remain convinced that eventually everyone will do it.

Rick Tetzeli: Is the Bay Area still the hub of everything tech, the way it was when you moved out there 25 years ago?

Bill Gurley: First of all, there are places that have had incremental success over the last two decades. Seattle has just been phenomenal for start-ups. New York has had a couple of really big wins. So things have already opened up.

Hybrid creates a much bigger question mark for the Bay Area.

The number-one risk of being outside the Valley was always, "Can I get the executive talent?" You could always get programmers. You could always get customer support people. Now, with hybrid, maybe you can get the executive talent, too. Found your company in Chicago and hire your executive talent even if they want to keep living in the Bay Area.

The other thing that has reinforced the Bay Area is that, culturally, everywhere you go, you run into someone connected to the industry. That creates a ton of serendipity outside the office. It leads to companies being started and people changing jobs, and it leads to idea propagation. Matt Ridley talks about ideas having sex and how that can impact innovation and increase productivity. Silicon Valley is a great example of that.

The ideas that are relevant can be very ephemeral and fleeting. Take something like knowing how to gain customers on an iOS app. You could have been a marketing guru for 20 years, but if you went on vacation for five years and then came back, you

know nothing, right? You know nothing. There's a constant reinforcement of what's happening that has always been an advantage to being in the Valley.

Well, if you're working on, say, a Web3 project these days, you're probably doing so on a Discord channel. They're all working in Discord. And so that's where you're having those moments where ideas might have sex on a constant, daily basis, in a Slack-like way that cuts out geography. That's really interesting.

Rick Tetzeli: You mentioned Web3. We haven't talked much about technology per se, but I'm wondering if before we close you could tell me what is the most promising tech trend that you're looking at right now? Is it Web3 or crypto or some of the other things we hear about? Or is there something else that has the greatest potential?

Bill Gurley: For me, personally—I'm not speaking for my firm—I'm most motivated by all this stuff we've been talking about around hybrid and the fact that I can hire someone from around the globe instead of 20 miles from my office. Think about the productivity and innovation unlock that that might create. There

are all kinds of problems that entrepreneurs need to solve. How do you get the serendipity back? How do you measure productivity? These kinds of Slack- and Zoom- next-generation things are super interesting to me. For instance, I would think that there should be some kind of new version of LinkedIn because of all this.

On crypto, there's a moment of reckoning right now that I think is highly dependent on regulatory ambiguity and what happens in Washington. We're kind of stuck until that is clarified.

I also think that the crypto industry is in desperate need of some hard-core proof points. There's a lot of rhetoric. I mean, as everyone says, Bitcoin is its own thing. It is a proven, hard-core protection against your government coming after your money. You could theoretically escape a dictatorial or tyrannical country with your money on this thing—reemerge elsewhere and still have your money. That's a real feature that has been obtained, and people can bet on whether that's valuable. I would call it an achievement. But I don't know how many other achievements there have been.

Bill Gurley is a general partner at venture capital firm Benchmark. **Rick Tetzeli** is the editorial director of McKinsey Quarterly and an executive editor in McKinsey's New York office.

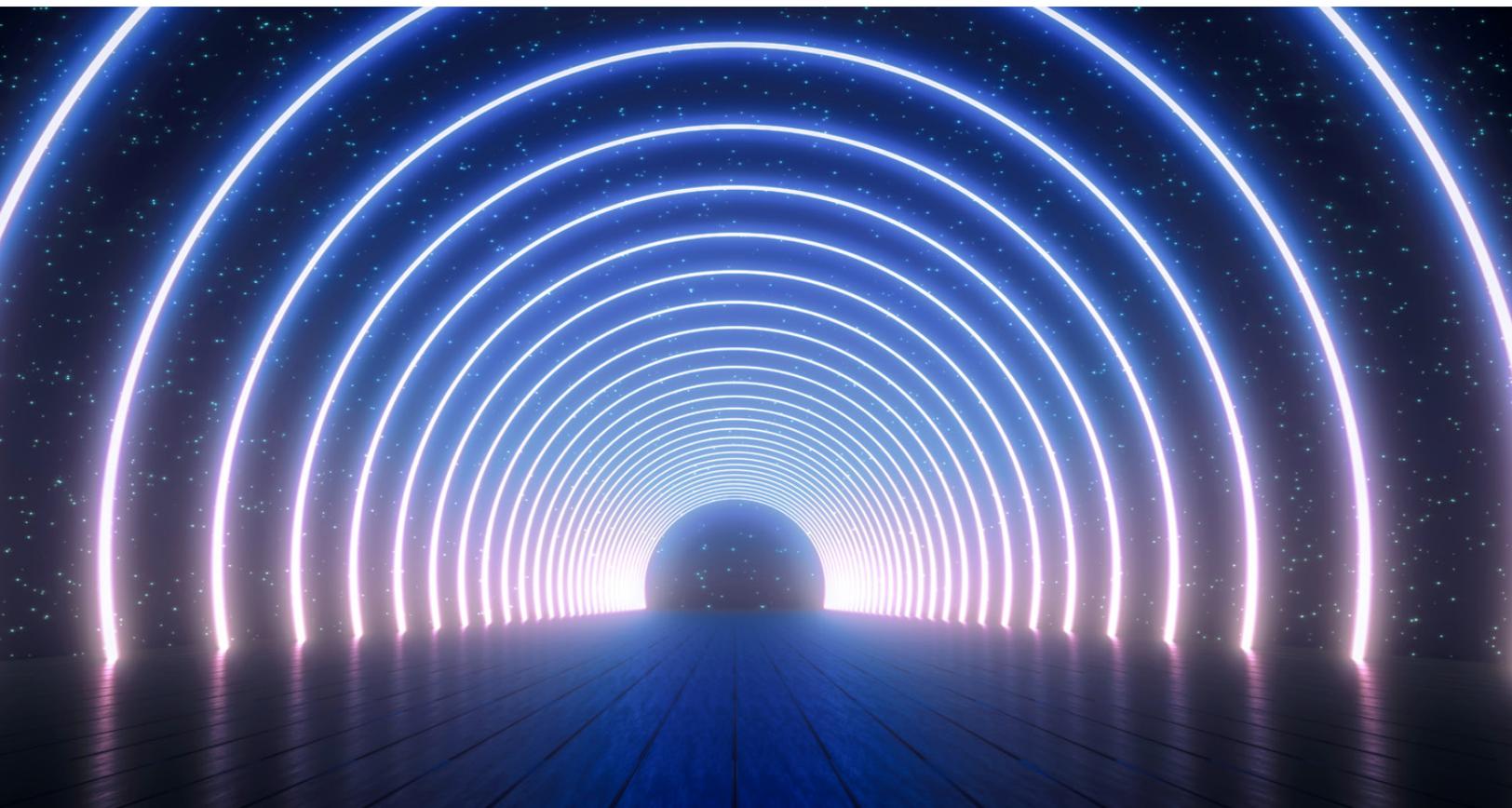
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Infrastructure investing will never be the same

Traditionally staid and stable, infrastructure investing has been shaken up by revolutions in energy, mobility, and digitization, making it imperative for investors to reassess the strategy's risk and return dynamics.

by Marcel Brinkman and Vijay Sarma



Infrastructure investing has long offered investors the best of both worlds: low-maintenance investments with predictable risk profiles and strong, consistent returns, even through chaotic periods.

The past few months have been turbulent, with significant inflation, increases in interest rates, declining equity markets, and a looming threat of recession. This uncertain panorama comes on the heels of the deep disruptions caused by the COVID-19 pandemic. While infrastructure investments are seen as better able than other investments to withstand such pressures, investors in the asset class still have to deal with the impact of structural shifts in the economic environment.

Meanwhile, there are deeper, more gradual ways in which the asset class is changing—and investors need to change with it. Revolutions in energy, mobility, and digitization are introducing new dynamics to existing infrastructure investments that previously appeared almost impervious to change. At the same time, economic and social transformations are introducing new types of investments that represent opportunity for investors.

The infrastructure shake-up and the unpredictable pace at which the energy transition is unfolding require investors to scrutinize their existing portfolios and ensure that assets are correctly rated for risk/return. Some investments viewed as low-risk, low-return “super core” assets may carry more risk than is currently understood, particularly as entire fuel sources and related assets are phased out of the economy. On the other hand, maturing network technology, combined with large-scale social changes such as the acceptance of remote working, have moved some digital assets down the risk spectrum. Investors need to understand which categories assets belong to today and adjust their portfolios accordingly.

Exposure to new types of infrastructure assets demands that investors manage higher levels of risk.

Many next-generation investments are self-evident, such as electric-vehicle (EV) charging networks, battery storage, hydrogen distribution, and smart motorway and rail technology, 5G telecom networks, and data centers. These assets offer many of the characteristics that infrastructure investors look for: real assets, protected market positions, and the potential to generate stable cash yields. However, to get exposure to these new asset classes, investors will have to accept a period of significant investment and negative cash flow, along with development, technology, and commercial risks.

Benefiting from emerging opportunities calls for more active investing. It can be hard to come by alternative-energy infrastructure deals that meet even the modest \$200 million minimum ticket size for many investors. The few that do are often exorbitantly priced, with EBITDA multiples reaching the mid-20s in some cases. To participate in the energy transition, investors will need to source deals more creatively and be willing to build businesses. For decades, returns from infrastructure investing have been more stable than those in both public and private equity markets and have provided a comforting record of success. But hidden within the steady graph lines are pockets of value destruction that should serve as a warning against complacency. By being aware of the factors causing the sea change in infrastructure, and knowing what pivots to make in response, investors can best prepare for the future.

The infrastructure shake-up requires investors to scrutinize assets’ risk/return profile

Traditional risk-based classifications are being challenged by fundamental drivers led by the energy transition, including sustainability targets, electric mobility, and digitization. These forces mean that investors should assess the risk/return profile of specific assets and potentially recategorize them to account for new sources of both risk and growth.

Infrastructure's traditional taxonomy

As the infrastructure investment sector matured over the last few decades, the asset class branched into funds in three categories: super core, core, and core-plus.

Super-core investments are the lowest risk and lowest return. Traditionally, super core has included assets such as regulated utilities—which have regulated tariffs and little volume variation—and availability-based public-private partnership projects.

Core investments are relatively low risk and low return. Traditional assets in this category have included nonregulated oil pipelines and demand-risk transport-related assets such as toll roads, highways, and airports. Some assets that were of little interest to infrastructure investors a few years back, such as fiber-optic technology and telecom towers, are now considered core infrastructure.

Core-plus investments carry more risks and can offer returns approaching those of private equity investments, at 15 percent or more. Such assets mimic the characteristics of classic infrastructure investments (see sidebar, “What is a classic infrastructure investment?”) but are not universally considered part of the asset class. Fish transport, holiday villages, and crematoria are examples of core-plus assets.

Reassessing risk and return

In the past, individual assets sometimes moved up or down the risk/return spectrum. But with changes in energy, mobility, and digitization, more assets need to be reassessed: assets that have long dwelled squarely within an asset subcategory may need to move to a different bucket today, and there may be big shifts from super core all the way to core-plus. Dramatic reshuffling is occurring because assets that were once seen as immutably stable, such as gas pipelines, are now exposed to significant energy transition risk.

What is a classic infrastructure investment?

Historically, infrastructure investors have looked for investments that have the following attributes:

- are real, capex-intensive assets (something you can touch; that is anchored in the ground)
- are essential services (such as energy provision or transport infrastructure)
- offer steady and stable returns (and are not exposed to volatile commodity price markets or demand uncertainties)
- are downside protected (meaning they will perform well irrespective of the economic cycle)
- provide cash yields (something that is operational, profitable, and has sufficient cash flow to pay back to the shareholders) driven by high EBITDA margins that provide risk protection, a cushion for up-front capital expenditures, and higher leverage
- have barriers to entry, either via a regulated monopoly or long-term contracts
- are typically within energy (such as electricity or power distribution, oil pipelines and storage terminals, and renewables with power-purchase agreements); telecom (such as mobile towers, fiber, and data centers); transport (including seaports, airports, roads, and rail); and certain healthcare and education assets

Examples of recent asset subclass migrations include the following:

- *Gas networks* carrying methane hydrocarbons, which in a net-zero transition would potentially need to be phased out in regions where gas is substituted for low-carbon alternatives: while hydrogen can utilize some of these assets, the general view is that gas distribution will be required less, and that additional money will need to be spent to repurpose the networks. These risks mean that gas distribution is moving from super core to core or even core-plus.
- *Motorway service areas (MSAs)* that distribute fuel for internal-combustion engines (ICEs): as the number of EVs increase, fuel consumption for ICEs will likely decrease, but the greater need for EV charging stations presents a significant business opportunity for MSAs. This potential demand means that MSAs could move from core-plus to core.

- *Digital infrastructure assets* (such as mobile towers and fiber networks) that have moved down the risk spectrum as network communications technology matures: Digital assets now show returns that have moved them all the way from the core-plus to the super-core range.
- *Power networks*, which typically have a regulated return and stable revenues, are seen as super core: However, growing investment demands create deployment and regulatory risks that need to be taken into account.

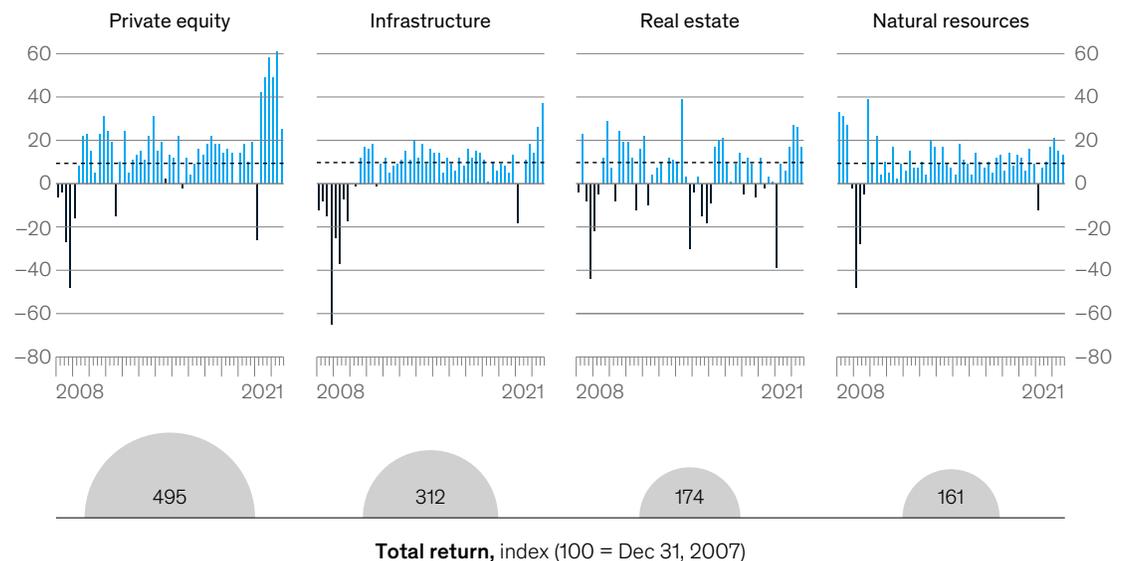
A new era demands that investors change their approach

Investors should be aware of a broader sea change in the risk/return profile across the whole asset class. Investors have become accustomed to thinking of infrastructure as a haven. A record of steady returns relative to most other alternative asset classes (Exhibit 1), as well as a reputation as an

Exhibit 1

Returns from infrastructure investing have been stable, delivering higher returns than most other alternative asset classes.

Annualized quarterly TSR, %



Source: Preqin analysis of infrastructure funds expectations

asset class that can offer a hedge against economic downturns, enabled infrastructure funds in 2021 to raise close to \$130 billion, around 55 percent more than in 2016.

However, today there are relatively few assets that promise the steady returns that infrastructure investors became accustomed to in recent decades, leading investors to lower their expectations for future returns (Exhibit 2).

Moreover, infrastructure contains pockets of value destruction—most notably, downturns in telecom- and transport-related assets caused by the onset of the pandemic—that need to be managed wisely (Exhibit 3).

Investors should adopt a new approach to underwriting

To manage the new dynamics introduced by the energy transition and other structural changes,

investors need to move beyond the historical underwriting approach that focused almost exclusively on relatively static technical assessments and financial models. Today, other factors need to be layered on for a full-picture understanding.

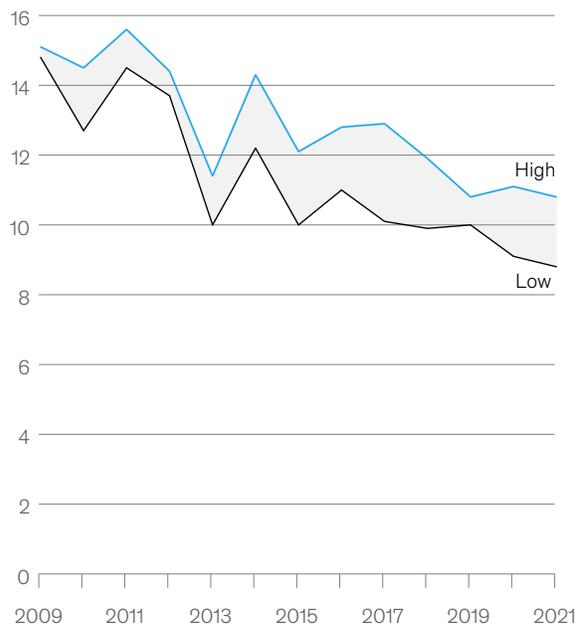
MSAs, for example, were traditionally evaluated based on traffic projections. While traffic is still important, the impact of EV charging means investors now need to understand factors including EV penetration, battery evolution, charging technology, and grid capacity.

Likewise, utilities' diligence has moved beyond technical and regulatory assessments to complex modeling of the impact of the energy transition (for example, how hydrogen could be a potential replacement for pipelines that currently carry natural gas). These changes require deal teams to have a different set of skills and capabilities (or a set of experts that can apply its skills during diligence),

Exhibit 2

Expectations for returns from infrastructure investments have been declining.

Average target internal rate of return (IRR),¹%

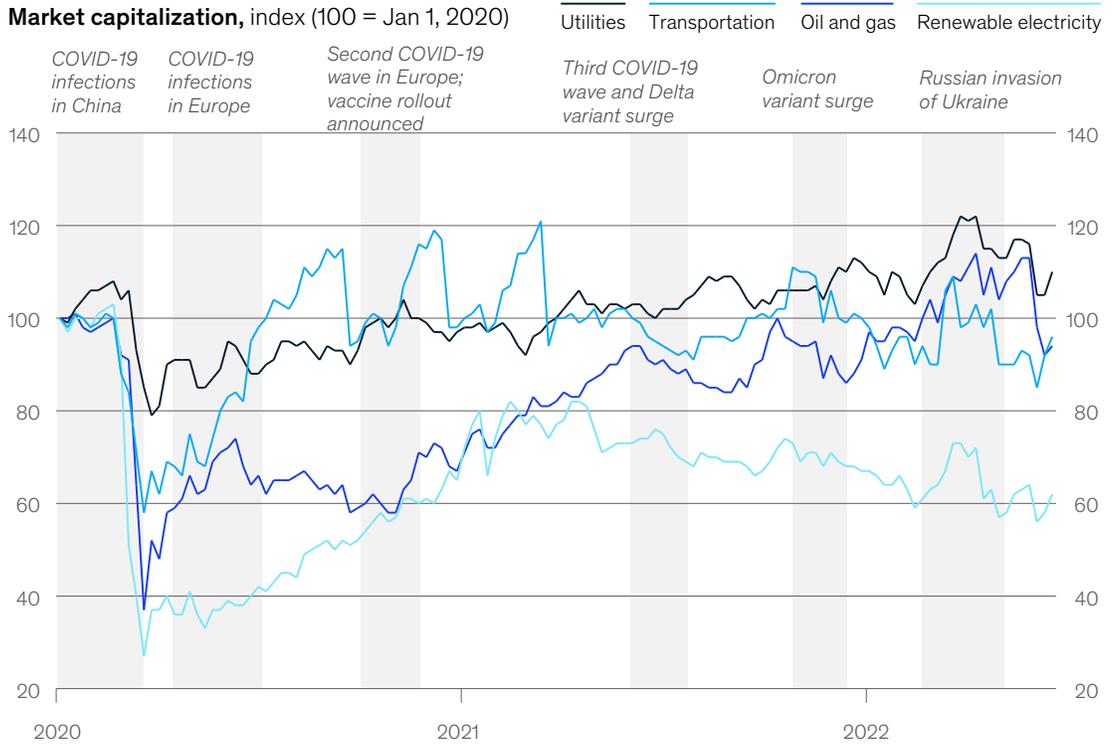


4–5%
decrease in average target IRR per year

20–40%
decrease in target IRR over the past 10 years

¹Low- and high-target IRRs across 20–40 funds per year. The returns are across all primary investment strategies (core, core plus, fund of funds, debt, opportunistic, and value added).
Source: Preqin analysis of infrastructure funds expectations

Most infrastructure sectors have recovered to pre-COVID-19 levels, except for renewables.



Note: As of July 1, 2022; predefined S&P sector indexes.
Source: Preqin analysis of infrastructure funds expectations

as well as a more proactive approach to developing an investment case.

Investors can use best-in-class asset management and technology to deliver superior returns

The days of sitting back and enjoying predictable, long-term yields have waned. The changing environment means that investors need to be more proactive about asset management, revisiting the risk/return dynamics of key asset classes to ensure that they have a current understanding of value drivers and trends.

Large investors should recognize that there have been enough developments over the past two

years to trigger a complete reassessment of their portfolios and a fresh set of priority investment themes and theses. The speed and uncertainty of the energy transition, for example, can mean that several critical assumptions underpinning an investment (such as EV penetration) move in unpredictable directions and at unforeseen speed. Appropriate and timely interventions may be required to preserve value. Investors need to actively manage a complex menu of strategic, operational, and digital initiatives to ensure that assets deliver according to the management plan.

Smaller investors with a minority stake also need to be cognizant of, and respond suitably to, changing risk/return equations. In some cases, that could

include exiting assets if they lack sufficient leverage over management to enforce a strategic shift, or if the new risk/return profile no longer matches their ongoing assessment.

Investors also need to use operational and digital levers to create buffers for inevitable downturns, and to correct course when fundamentals shift. Our experience suggests that investors can use digital interventions and analytics to achieve improvements in a range of situations including reducing airport congestion, enhancing predictive maintenance, reducing procurement spending, reducing hospital waiting times, and improving telecom network performance, among others.

Benefiting from emerging opportunities calls for more active investing

Strong fundraising is likely to increase competition for assets. At the same time, fundraising is more concentrated, which means minimum equity

investments need to be large. These concentrated funds are increasingly vying with one another to raise larger funds and maximize the size of assets under management (Exhibit 4). The upshot is intense competition for suitable infrastructure targets in a higher interest rate environment.

The energy transition is a prime example of a large-scale opportunity that could potentially be a recipient of these funds. The global economy needs an estimated \$9.2 trillion in annual average investment in physical assets to achieve net-zero emissions by 2050.¹ Yet this sector is growing fast from a small base, and there are still few investable targets at scale.

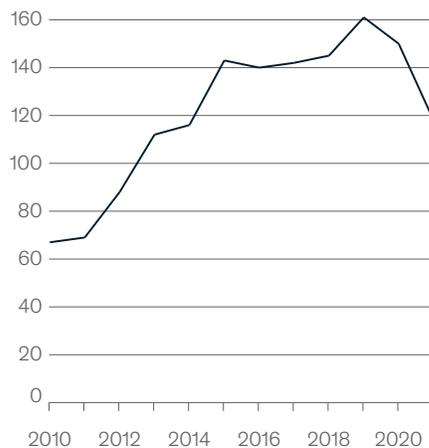
Investors can look for deals in niche markets, through integrations and carve outs

Investors who want to participate in the energy transition could get left behind if they sit back

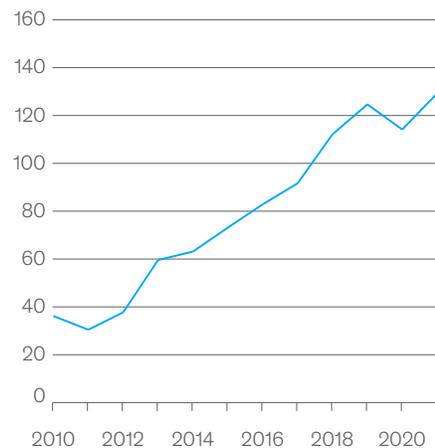
Exhibit 4

Infrastructure fundraising has increased at a faster pace than the number of funds, resulting in larger fund sizes.

Number of funds



Funds raised, \$ billion



Source: Infra Investor, May 2022; Preqin

and wait for competition to die down, climate tech developers to scale, or emerging markets to mature. Instead, they can consider more active investing styles that put them in the driver's seat.

One approach to sourcing proprietary deals is through detailed insights into niche markets versus reactive responses to competitive processes. For example, some investors in energy services have developed a proprietary view on creating value by scaling up and consolidating national champions in the nascent energy services space, helping them emerge successful in highly competitive auction processes for scarce assets in the sector.

Employing roll-up and bolt-on strategies can be critical to scaling up smaller investments in segments in which larger companies simply do not exist. In some cases, investors may set up their own management teams and build businesses from scratch. For example, a consortium of pension funds established a platform for project investments in renewable-generation assets. The platform now comprises more than 150 projects across the world with a total generating capacity of more than three gigawatts.

Building relationships with utilities to go after carve-out opportunities can be a way to build scale quickly in many areas where credible at-scale investments are hard to find.

In addition, some funds are setting up separate funds with a different investment profile (typically, higher risk and smaller ticket size) to go after the energy transition opportunity in its early stages. The intention is eventually to migrate these assets to their infrastructure funds when they mature, or to sell them to other infrastructure funds.

There are, of course, opportunities outside of the energy transition. For example, several investors have recently bought large-scale telecommunications companies to get access to fiber and towers, and have proceeded to scale these acquisitions or integrations.

Strong evidence suggests that despite pressures from the flood of capital and the potential consequences of a widely feared recession, infrastructure remains an attractive long-term investment avenue for institutional investors.² To stay in the race, investors will need to push the boundaries of investable assets, while also adhering to the investment objectives underlying infrastructure as an asset class—and of their limited partners.

¹ "The net-zero transition: What it would cost, what it could bring," McKinsey Global Institute, January 2022.

² In 2021, infrastructure and natural resources set all-time highs for fundraising, AUM, and deal volume. For more, see "McKinsey's Private Markets Annual Review," McKinsey, March 24, 2022.

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The authors wish to thank Arpit Kaur, Alexandra Nee, Anders Rasmussen, August Runge, Eivind Tørstad, Alexander Ugrumov, and Varun Vijay for their contributions to this article.

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US wealth management: A growth agenda for the coming decade

Mounting hopes of postpandemic recovery signal an imperative to prepare for the changes in technology, consumer needs, and society that will shape the future of the wealth management ecosystem.

by Pooneh Baghai, Alex D'Amico, Vlad Golyk, Agostina Salvó, and Jill Zucker



Wealth management is a growth industry, but it is experiencing a set of accelerating disruptions. While the pandemic challenged the performance of the US wealth management industry for much of 2020, the last 12 months have given rise to optimism that the conditions for a significant wave of innovation and experimentation across the wealth management ecosystem are in place. The conditions include rapid technological advancements, fast-evolving consumer needs and behaviors (accelerated by the pandemic), and an environment of economic stimulus.

To thrive in this dynamic environment, firms must prioritize growth, adopt an innovation mindset, and be prepared to reallocate resources rapidly in response to the changing context. Finally, to free resources for strategic investment and prepare for any potential market downturn, firms can rethink their cost structures and improve the industry's spotty record on cost management.

To guide these efforts, this paper offers a brief overview of the US wealth management industry's present conditions and then presents four themes that define the new growth narrative we foresee. We recommend agenda items for wealth managers

to address as they plan how to flourish in the changing ecosystem. Finally, we offer questions for organizational self-assessment.

Coming out of the crisis: Resilient but not unscathed

At face value, the US wealth management industry entered 2021 from a position of strength—record-high client assets, record growth in the number of self-directed and advised clients, and healthy pretax margins (Exhibit 1). However, beneath these strong headline numbers, the story was mixed, with the worst two-year revenue growth since 2010, as well as negative operating leverage. The depressed margins and profit pools that resulted were caused primarily by rock-bottom interest rates and uneven cost discipline (Exhibit 2).

Consequently, while the industry is now benefiting from vigorous market performance, it faces significant crosscurrents: equity-market and interest-rate uncertainty and industry-specific challenges including lack of cost discipline, increased competition from new entrants, and an aging and shrinking advisor force.

Exhibit 1

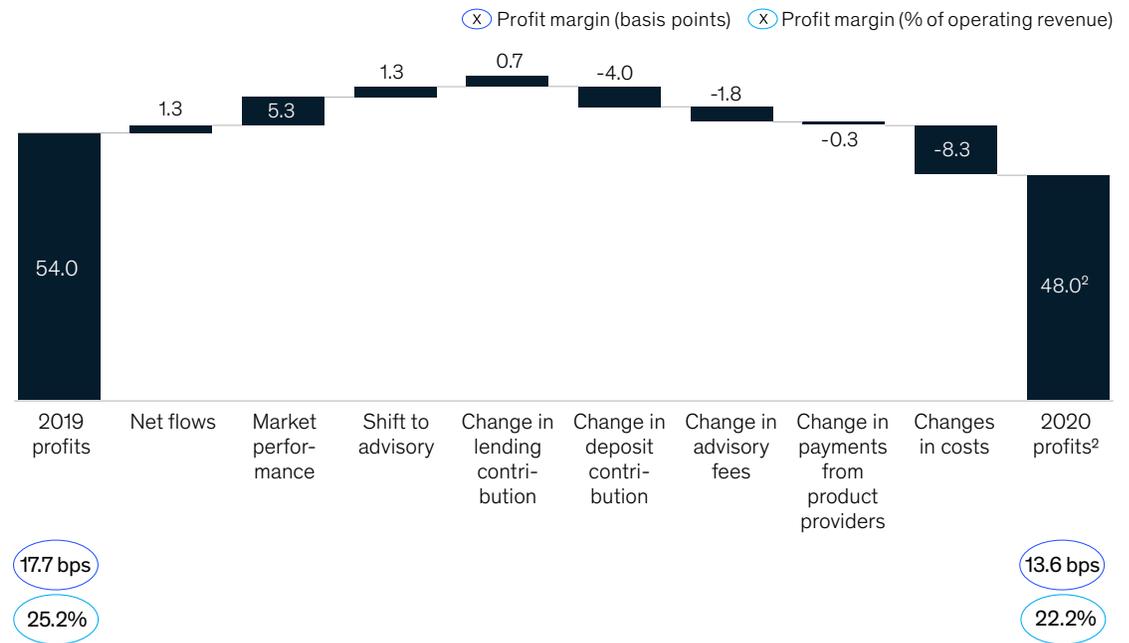
US wealth management entered 2021 from a position of relative strength.



Exhibit 2

US profit pools declined by 11 percent in 2020.

Profit pool decomposition of the US wealth management industry,¹ \$ billion



¹ Pretax operating profits. Annual profit pools based on average assets under management.

² Contributions from funds transfer pricing, payment for order flow, and other factors add up to <\$0.1 billion and are excluded from the chart. Source: McKinsey Global Wealth and Asset Management Practice

Despite this near-term uncertainty, US wealth management remains a growth industry, albeit with moderating revenue growth projections. McKinsey modeling suggests industry revenue pools will grow by about 5 percent per year over the next five years,¹ driven by moderating market performance, moderate net flows, and the continued shift from brokerage to advisory (where revenue yields are typically higher). However, the growth will not be equally split among industry segments. We expect digital advice models, including robo- and hybrid advisory, to continue growing fastest, potentially even outperforming their historical revenue growth of more than 20 percent per year. Next in terms of growth will be registered investment advisors (roughly 10 percent projected annual growth rate), followed by national/regional broker-dealers (6 percent), direct brokerages (5 percent), wirehouses (2 percent), and other broker-dealers (independent, retail, and insurance owned) plus

private banks (1 percent). If interest rates return to prepandemic levels, wirehouses and direct brokerages will disproportionately benefit, given their reliance on interest income from cash for profitability, with the overall growth rate for the industry reaching about 7 percent a year—similar to the growth that occurred between 2015 and 2018.

A growth agenda for the coming decade

Over the last 18 months, the industry has spurred a significant wave of innovation and experimentation. It is also facing long-standing demographic shifts that will redistribute wealth among subsegments. This combination of forces will shape growth trends for years to come. We see four key themes: fast-growth segments, new client needs, new products, and new business models (Exhibit 3).

¹ Long-term asset class forecast, Q2 2021, State Street Global Advisors, April 22, 2021.

Fast-growth segments offer new potential

Three investor segments are showing signs of significant and lasting growth: women, engaged first-time investors, and a segment we call hybrid affluent investors.

Women are taking center stage as investors over the next decade. Today, women control a third of total US household investable assets—approximately \$12 trillion. Over the next decade, this share will grow. The biggest cause of this shift will be demographics: as baby boomer men die, many will cede control of assets to their female spouses, who tend to be both younger and longer lived. By 2030, American women are expected to control much of the \$30 trillion in investable assets that baby boomers will possess—a potential wealth transfer that approaches the annual GDP of the United States. At the same time, younger affluent women are becoming more financially savvy; for

example, 30 percent more married women are making financial and investment decisions than five years ago.²

A new wave of engaged investors are opening accounts. The resurgence of the engaged-investor, or active-trader, segment has been one of the most headline-catching disruptions in the industry. Since the start of 2020, more than 25 million new direct brokerage accounts have been opened, a significant percentage by first-time investors. This growth resulted from a confluence of prepandemic market developments (for example, the elimination of online brokerage commissions, access to fractional share capabilities) and pandemic-related trends such as high savings rates (enabled by lower consumption).

While this segment's exponential growth is likely not sustainable (for example, there was a sharp decline in trading app downloads and active daily

² For more on these trends, see Pooneh Baghai, Olivia Howard, Lakshmi Prakash, and Jill Zucker, "Women as the next wave of growth in US wealth management," McKinsey, July 29, 2020.

Exhibit 3

Contours of the new growth narrative.

1 Fast-growth segments	Women	Engaged first-time investors	Hybrid affluent investors
2 New needs	Personalization	Omnichannel access	Integrated banking and wealth
3 New products	Private markets	Digital assets	
4 New business models	Services to registered investment advisors	Digital advice models	

Source: McKinsey Global Wealth and Asset Management Practice

\$30 trillion

in investable assets will be possessed by baby boomers by 2030, much of it controlled by women

users in the third quarter of 2021), it remains poised for accelerated growth over the next decade, given engaged investors' relatively low median age of 35.³ The opportunity for wealth managers is to serve this segment by meeting their demand for direct brokerage-based investing and to build deeper relationships with them over time—for example, by recognizing that these new investors tend to express their personal values in their investment decisions.

Hybrid affluent investors are an opportunity to differentiate. While headlines have focused on the rise of first-time young investors with typically low assets, growth in the hybrid investor segment—those with at least one self-directed account and a traditional advisor—has been overlooked. In 2021, a third of affluent investors—households with more than \$250,000 and less than \$2 million in investable assets—were hybrid (Exhibit 4), a sharp increase of nine percentage points in just three years. The biggest beneficiaries of this trend have been incumbent and new direct brokerages, as well as some traditional wealth managers with sizable direct brokerage platforms.

The rapid growth of hybrid affluent investors is a result of two trends that are expected to persist: investors' desire for human advice and the ease and affordability of direct investing. Therefore, to foster deep relationships with affluent clients and prevent them from investing with competitors, wealth managers of all types need to have both direct brokerage and advisor-led offerings with a seamlessly integrated experience across the two. Achieving this will not be easy; it will require careful

management of channel conflicts and potential revenue cannibalization.

New customer needs provide an opening to differentiate

Investors are increasingly looking for institutions that can provide them with omnichannel access, integration of banking and wealth management services, and personalized offerings. As similar kinds of benefits become available from providers of other services, investors see them more as needs than as luxuries. In fact, fully 50 percent of high-net-worth (HNW) and affluent clients say their primary wealth manager should improve digital capabilities across the board.

Omnichannel access is no longer just 'nice to have.'

One of the clearest disruptions triggered by the pandemic has been the sharp acceleration of digital adoption across consumer segments—including wealthier and older clients who were previously less digitally inclined with respect to financial advice. As a result, according to McKinsey's latest Affluent and High-Net-Worth Consumer Insights Survey, digital is now the most preferred channel for clients, closely followed by remote (Exhibit 5).

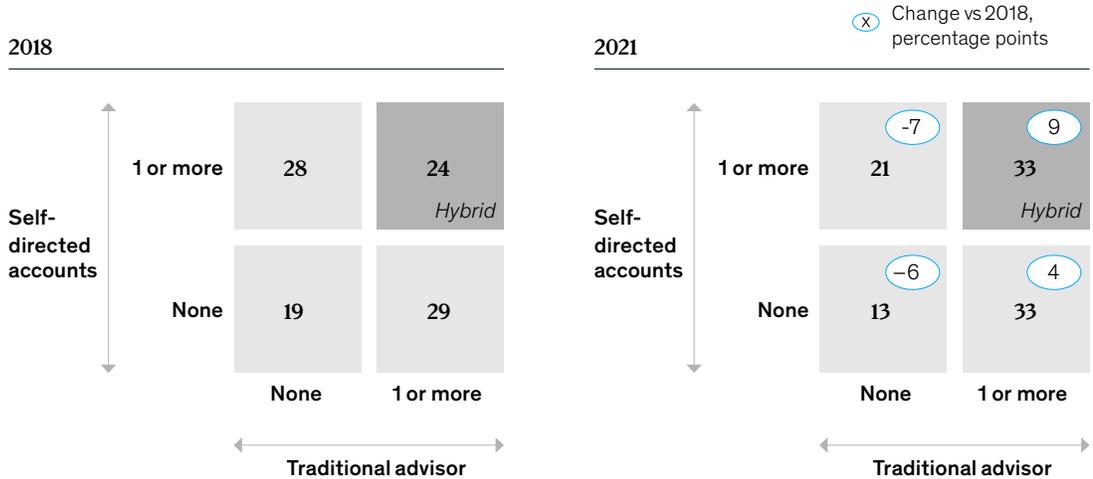
This trend is even more pronounced for the HNW segment, which we define as households with more than \$2 million in investable assets: roughly 40 percent of HNW clients say phone or video conferences are their preferred wealth management channels, and only 15 percent look forward to going back into branches or resuming in-person visits. Interestingly, the preference for digital and remote engagement among HNW clients is higher than for their affluent counterparts.

³ Schwab Generation Investor Study 2021.

Exhibit 4

The fastest-growing segment of affluent investors is hybrid—those with self-directed accounts plus a traditional advisor.

Use of self-directed accounts and traditional advisors, % of affluent investors¹



¹Defined as having \$250K–\$2M in investable assets. Source: McKinsey Affluent and High-Net-Worth Consumer Insights Survey

Convergence of banking and investing has gone mainstream. Over the last three years, there has been a striking increase in clients' preference to consolidate their banking and wealth relationships to achieve convenience and better relationship deals: the share with this preference has risen from 13 percent in 2018 to 22 percent in 2021. The trend applies to both wealthy and young households (Exhibit 6). In particular, 53 percent of those aged under 45 and about 30 percent of those with \$5 million to \$10 million in investable assets prefer to consolidate relationships.

Banks and wealth managers alike can benefit from this trend, but their starting position differs by client

segment: HNW, ultra-HNW,⁴ and older clients tend to consolidate banking with their primary wealth manager, whereas young investors are more likely to consolidate wealth management with their primary bank.

Clients' reasons for consolidating with their primary bank or investment firm vary. High-yield deposits, lower management fees, and seamless transactions across accounts are the top three reasons for consolidation—and are basically table stakes. Beyond that, our research has found that banks generally win on convenience (for example, an existing relationship with the client, customer service tailored to younger clients), while investment firms win on products and reputation

40%

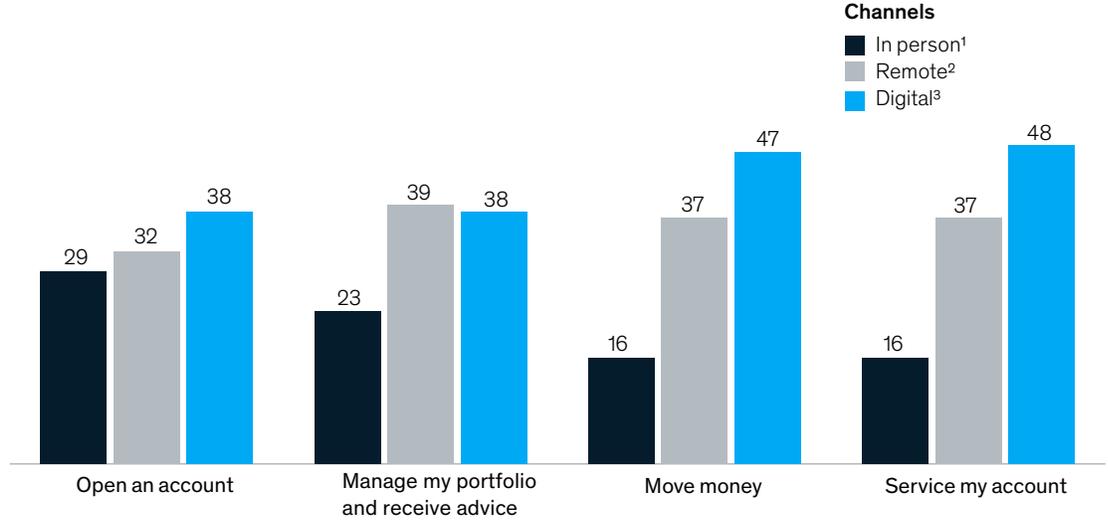
increase in total direct brokerage accounts since the start of 2020—more than 25 million new accounts

⁴In this article we define HNW customers as those with between \$2 million and \$25 million in investable assets; ultra-HNW have more than \$25 million in investable assets.

Exhibit 5

Investors anticipate a more modest role for in-person channels than for digital and remote when the pandemic recedes.

Anticipated preferred channel post-COVID-19, % of investors



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

¹Includes respondents who selected "in-branch" or "in-person with financial advisor."

²Includes respondents who selected "email," "phone," "mail/post," "SMS/text," "secure video conference, eg, Zoom, Skype, FaceTime," or "online or mobile live chat."

³Includes respondents who selected "company website" or "mobile app/site."

Source: McKinsey Affluent and High-Net-Worth Consumer Insights Survey, n = 5,874

(for example, more expansive accounts or products such as securities-based lending, concierge-like customer service tailored to older clients, and recommendations).

The increased preference for consolidating banking and investing has been driven by a flurry of innovation. National banks are building wealth management capabilities and closely integrating experiences with traditional banking services, often

in partnership with fintechs. Full-service wealth managers are upgrading their digital banking capabilities. And consumer-facing fintechs—with millions of users—are blurring the lines between investing and cash management.

Rise of personalized investing. Personalization matters. It is a key driver of client satisfaction and the number-three factor for clients selecting financial advisors. Wealth managers have

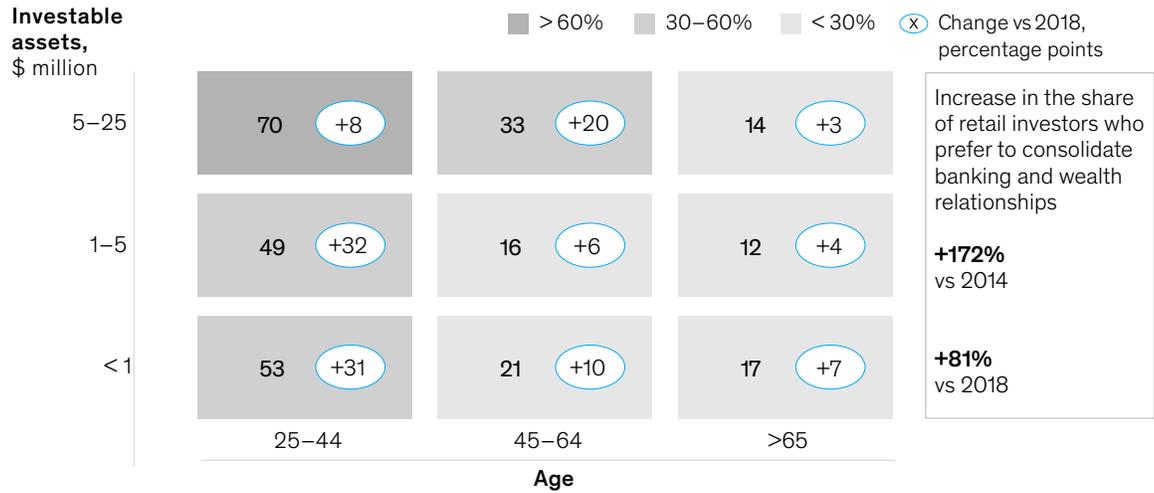
50%

of clients think their primary wealth manager should improve their digital capabilities

Exhibit 6

Younger and, to a lesser extent, wealthier segments have a strong preference for consolidating banking and investing.

Agreement with the statement “I prefer to place investments with a firm where I also have a banking relationship,” % of retail investors



Source: McKinsey Affluent and High-Net-Worth Consumer Insights Survey, n = 5,874

responded to the demand to personalize investment management with customized, tax-efficient managed accounts. Because of their operational complexity, these products have typically been accessible only to the HNW and ultra-HNW segments. However, direct indexing, fractional share trading, and \$0 online commissions are shifting the paradigm by enabling customized portfolios of securities at lower minimums.

Assets under management (AUM) in direct indexing tripled between 2018 to 2020, reaching \$215 billion, or 17 percent of the retail separately managed account (SMA) market. We anticipate direct indexing volumes to triple through 2025, given how this new investing technology meets client needs, most notably the growing demand for tax-efficient investing and the desire of some retail investors, particularly younger clients, to ensure that their portfolio holdings reflect their personal values (Exhibit 7). The recent flurry of acquisitions of direct indexing providers

by leading US wealth and asset managers will create further supply-side momentum in expanding the growth of the category.

Broader adoption among clients will require further innovation. For both self-directed and advisor-led models, offering direct indexing requires a careful consideration of the trade-offs associated with taxes and environmental, social, and governance (ESG) constraints. All this creates a need for intuitive interfaces and analytical tools, which need to be integrated into the advisor desktop and workflow.

New products expand ways to serve customers

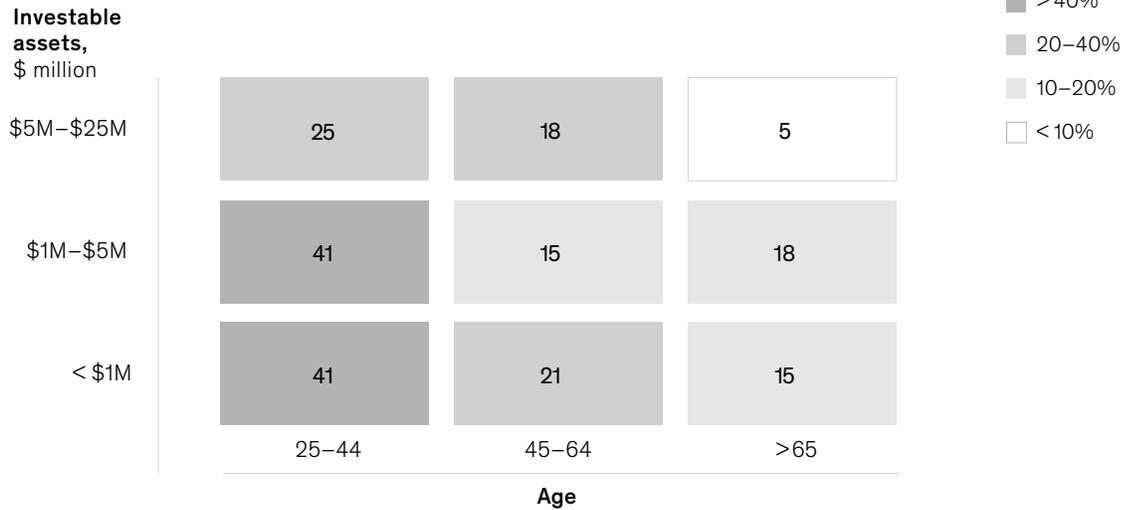
Across industries, transformation arises from the introduction of new products. In wealth management, we see notable potential in two main categories of new products: investments in private markets and investments in digital assets.

Exhibit 7

Younger and, to a lesser extent, less affluent segments are more likely to consider ESG when choosing investments.

Split of investors who regard ESG as a top 3 consideration when choosing investments

% of investors



Source: McKinsey Global Wealth and Asset Management Practice (2021, n = 3,776 for < \$1M, n = 1,709 for \$1–\$5M, n = 389 for \$5–\$25M)

Democratization of private markets. In the current lower-for-even-longer interest-rate environment, investors’ appetite for alternative investments is as high as ever, with the young leading the way: about 35 percent of 25-to-44-year-old investors indicate an increased demand for alternatives. Within alternatives, private markets (private equity, private debt, real estate, infrastructure, and natural resources), an asset class that was once the preserve of institutional investors, is making inroads to individual portfolios. Large private-markets firms are building out retail distribution capabilities and vehicles, and home offices make it easier for clients to access private-markets products, often with the help of fintech infrastructure providers. Increased client demand and innovations have potential to increase the share of assets allocated to private markets from about 2 percent in 2020 to 3 to 5 percent by 2025, representing asset growth of between \$500 billion and \$1.3 trillion. It is imperative for wealth

managers to facilitate this growth by making it easier for their clients to access private markets.

Digital assets going mainstream. The arrival of an army of new retail investors has proven to be a boon to the growth of new asset classes that were incubated in the margins of the market. Nowhere is this phenomenon clearer than in the realm of digital assets, which have ballooned from a combined valuation of \$100 billion in 2019 to a market capitalization of more than \$2.5 trillion today. They span multiple digital asset classes, or “tokens,” beyond cryptocurrencies, including tokenized equities, bonds debt, stablecoins (typically pegged to conventional currencies), art, and collectibles. The motivations for investors in digital assets are diverse—experimentation, speculation, the search for inflation protection, or getting exposure to the building blocks of new technology that is increasingly cast as the next iteration of the internet (that is, Web3).

Whatever the motivation, investors' enthusiastic embrace of digital assets is very clear. For example, digital trading platform Coinbase has gathered a staggering 68 million verified users.

For wealth managers, digital assets present both an opportunity and a challenge. On the one hand, the cryptocurrency market has grown too large to ignore amid robust client demand; 11 percent of affluent clients and 8 percent of HNW clients invest in digital assets. On the other hand, three broad challenges are associated with offering cryptocurrencies. First, regulatory ambiguity—on asset classification and tax reporting, among other issues—has lingered, often creating uncomfortable levels of risk exposure for wealth managers. While it is still early days, the advent of crypto exchange-traded funds (ETFs) could help address some of these challenges. Second, the infrastructure required for offering digital assets, including custody services, differs from what is required for traditional investment products. Lastly, digital asset classes are not well understood by many advisors, so advising on the products is challenging for them.

Wealth managers face a choice: they can take a wait-and-see approach and accept the business risks associated with staying out of a rapidly growing market, or they can pursue the opportunity aggressively by leveraging partnerships with fintechs while addressing heightened regulatory risks. What remains for certain is that over the longer term, there is meaningful potential for a far broader class of digital assets to enter the investing mainstream and for the underlying technologies of blockchain-based decentralized finance (DeFi) to revolutionize the distribution of investment products, including the T+0 settlement cycle.

New business models position firms for growth

The last of our four contours of the new growth narrative is the introduction of new business models. Two such models are of importance: offering services to registered investment advisors (RIAs) and digitizing the delivery of advice.

Advisors' desire for independence presents an opportunity to serve RIAs. The last decade has seen a migration of advisors to registered independent advisors, with 24 percent of all financial advisors being part of an RIA in 2020, compared with 16 percent in 2010. This shift is expected to continue apace, with the share of advisors affiliated with RIAs growing to 26 percent by 2025. Motivations for advisors' migration to RIAs include the expectation of higher payouts plus two other factors: First, advisors are looking at the RIA channel as the best way to monetize their business, with RIA acquisition multiples for top advisors (those with books over \$1 billion) two to three times higher than retire-in-place incentives at traditional wealth managers. Second, technology and services firms, working in conjunction with the major custodians, have lowered barriers for advisors to launch their own firms. Moreover, advisors believe they can procure technology and services that are similar to or better than what traditional wealth managers provide.

While this trend presents a challenge for wirehouses and broker-dealers, whose advisor force is expected to shrink by 3 percent over the next five years, there is a silver lining: RIAs' reliance on third-party products and solutions creates an opportunity for participants in the wealth management ecosystem to seek a share of this fast-growing revenue and profit pool. Some ecosystem participants are viewing this segment in terms of a single product or service—lead generation, tech point solutions, custodial offerings, banking-as-a-service for advisors, asset management. Others, including turn key asset management providers (TAMPs), established custodians, and traditional wealth managers with attacker mindsets, are attempting to build a next-generation, wirehouse-quality platform for advisors.

Therefore, wealth managers, especially those who rely on advisor recruiting for growth, need to look beyond the competitive threat posed by the fast-growing RIA channel and explore new business models that would allow them to participate in this growing revenue and profit pool. Wealth managers seeking to serve the RIA segment will need to

manage technology as a core competency, and those with large advisor forces will need to manage the advisor attrition risks associated with opening up the platform (even partially) to RIAs.

The opportunity for digital advice models. Digital advice models, including robo-advisor and hybrid advisor models, have been around for more than a decade and have been the fastest-growing wealth management delivery model, with more than 20 percent annual revenue growth between 2015 and 2020. They still account for only about 1 percent of the market, but the growth prospects are high: the last three years—and last 18 months in particular—have marked a step increase in investor comfort levels with these offerings (Exhibit 8). In fact, the share of investors saying they are comfortable with remote advice grew from about 38 percent in 2018 to roughly 46 percent in 2021. Among clients younger than 45, the comfortable share grew from 43 percent to 59 percent. Similarly, while comfort with digital-only advice remains modest overall at about 15 percent, it has more than doubled since 2018 among investors under 45, to roughly half in 2021.

Unsurprisingly, the growing interest has motivated wealth managers to expand into and innovate in this channel. However, wealth managers should be aware that achieving a step change in adoption of digital advice offerings will require going beyond the lower-cost value proposition, privileged acquisition strategies, and brand equity. Among investors who do not express comfort with robo-advisor models, the main reasons they give are perceived lack of personalization, privacy concerns, and lack of motivation to explore the

offering. Bringing more investors on board will require matching the advisor-like experience with personalized content and solutions.

Embracing the new growth narrative: A four-part agenda

Clearly, wealth management remains an attractive industry with strong growth fundamentals and long-term margins. If anything, the disruptions we have discussed in this report expand the industry's options and will shape the growth narrative for the next decade.

Given the pace of change, stasis is not a viable option. We recommend that wealth managers follow a four-part agenda for action: reposition, redesign, reimagine, and reallocate.

Reposition the firm for what's next

Every wealth manager needs to take a hard look at the secular growth themes shaping the industry—fast-growth segments, banking, personalization, new product propositions, and new business models—and decide, based on the firm's unique sources of competitive advantage, which of these updrafts it should ride. Where a firm lacks natural advantages in capitalizing on particular growth themes, M&A is a critical lever for accelerating the repositioning of individual wealth management franchises. The last 24 months have seen numerous high-profile transactions as firms seek scale and/or the acquisition of new capabilities to accelerate their strategy. We expect M&A to be a particularly important theme over the next 24 months as wealth managers reposition themselves for the postpandemic “next normal,” whenever it arrives.

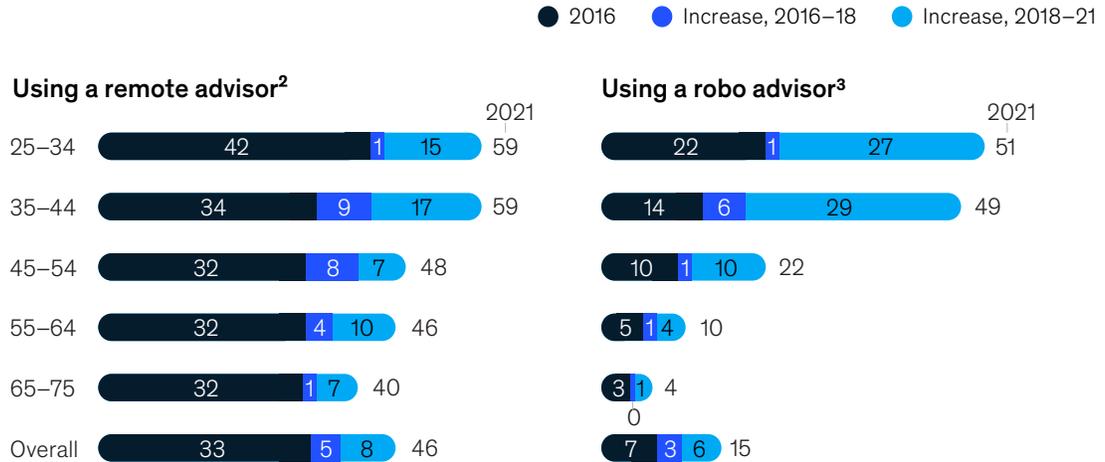
The logo consists of a large, bold, blue number '2' followed by a smaller, bold, blue letter 'x'. The '2' is significantly larger than the 'x', and both are rendered in a clean, sans-serif font.

faster annual revenue growth projected over the next five years for RIA channel versus industry overall

Exhibit 8

Comfort with digital advice models has accelerated in the last three years, especially for younger segments.

Comfort with using advice model, by age segment, % of investors¹



¹ Investors with investable assets of \$250K–\$5M. In 2016, n = 2,128; in 2018, n = 6,356; in 2021, n = 5,486.

² Respondents who agree or strongly agree with the statement “I would be comfortable working with an investment professional who does not live or work near me, if I can reach them over the phone and email whenever I need to.”

³ Respondents who agree or strongly agree with the statement “I would be comfortable with an automated online advisor (ie, a “robo” advisor) managing my investments based on my personal characteristics and goals.”

Source: McKinsey Affluent and High-Net-Worth Consumer Insights Survey

Redesign offerings for new needs

Firms also should monitor and try to anticipate evolving client needs, using this information to redesign their offerings. Examples could include new value propositions (for instance, around tax efficiency, integration of wealth and banking, or specific high-growth segments), privileged access to new products (such as digital assets or private markets), or completely new business models (for example, light-guidance digital offerings).

Reimagine client engagement and experience

The third agenda item is to radically reimagine client engagement and experience. The pandemic has reset clients’ assumptions about how they want to be served, and the accelerated uptake of technology has created unprecedented degrees of freedom for wealth managers. Every wealth manager needs to ask, “What is the blueprint for a client experience model in a digital-first world?” and

“How can such a model simultaneously deepen our relationships and broaden our reach?”

Reallocate resources to support the strategy

Finally, successful wealth management firms make a bold commitment to putting the money where the strategy is, and they make multiyear resource-reallocation decisions, including where firm’s top talent spends time, in favor of growth. Regular reallocation of resources is a critical but often neglected step that can close the loop between visionary strategic intent and successful implementation.

Our research across industries suggests that fortune favors the bold: the top third of companies, which have been the most dynamic resource reallocators, achieved 1.6 times higher total returns to shareholders than the bottom third (about 10 percent versus 6 percent annualized over 20 years).

60%

increase in share of investors comfortable with digital-only models since 2018 and 21% increase in those comfortable with remote models

In the wealth management context, we estimate that top performers are making strategic resource reallocation decisions to the tune of 15 percent or more of operating expenses over five years, whereas those simply dabbling with subscale experiments in strategic growth areas will not see results. Simply put, firms should not aim to be all things to all clients.

Five questions for wealth management executives

Given the significance of the opportunity at hand, wealth management executives must consider their firm's readiness to capitalize on it. To provoke a self-assessment, we offer five questions for executives to ponder and discuss with their teams:

1. **What are the three or four priority growth themes you are betting on for the next five years?** While several growth avenues and disruptions are reshaping the wealth management landscape, the optimal recipe will differ depending on an individual firm's starting position and its sources of competitive advantage. Clarifying priority growth themes and aligning with your executive team help lay a foundation for developing a winning growth strategy.
2. **Do you have the right team and operating model?** To paraphrase Peter Drucker's famous phrase, "Execution eats strategy for breakfast." A prerequisite for successful execution is an effective leadership team that is brought together around critical behaviors. In the context of wealth management and the shifts the industry is going through, these behaviors for executive teams must include operating in

an agile manner and developing connections across business units and functions. In addition, the team needs leaders who are not afraid to experiment and innovate and whose mandates are aligned with major growth themes that typically cut across business unit lines (for example, banking and wealth, segments, sustainability).⁵

3. **Does your ability to attract sought-after client-facing and technology talent match your ambition?** Over the last 12 to 18 months, wealth managers of different sizes and business models have publicly announced ambitious hiring targets with an emphasis on client-facing and technology talent. However, these plans have been challenged by severe labor shortages across industries, as a result of what has been dubbed the Great Attrition: 40 percent of employees say they are at least somewhat likely to leave their current job in the next three to six months, and 54 percent of employees say they leave because they do not feel valued by their organizations.⁶ Wealth management is no exception to this trend.

While many of the levers for attracting and retaining talent remain effective, other factors have gained importance during COVID-19, with more than 80 percent of workers saying that a hybrid-office working model is the optimal route forward. In addition to rethinking their operating models to attract and retain talent, wealth managers need to take bolder and more creative approaches to attracting new-to-industry talent. These may include flexible working arrangements, alternative career paths (including new payout

⁵ For more, see Natasha Bergeron, Aaron De Smet, and Liesje Meijknecht, "Improve your leadership team's effectiveness through key behaviors," McKinsey, January 2020.

⁶ Aaron De Smet, Bonnie Dowling, Marino Mugayar-Baldocchi, and Bill Schaninger, "Great Attrition' or 'Great Attraction'? The choice is yours," *McKinsey Quarterly*, September 8, 2021.

structures for client-facing roles and programs aimed at creating the next generation of advisor talent), and partnerships with various types of educational institutions.

4. *Are you reallocating a significant portion of your resources—spending and capital—toward priority growth areas, including M&A?* Systematic and dynamic resource allocation is an essential part of a winning business strategy. Achieving industry-leading levels in this area involves several steps: conducting a critical review of the firm’s existing cost structure, introducing a culture that continuously reallocates resources from low- to high-value tasks, increasing transparency around returns of individual projects, and implementing governance processes to enable more dynamic resource allocation.

Capital reallocation can be a powerful tool for acceleration of growth in high-priority areas, which requires a clear M&A blueprint consistent with the broader enterprise strategy. We expect three major M&A themes to shape wealth management deal making in the next 18 to 24 months: (a) transactions focused on platform synergies, mostly in the vibrant RIA market but also among the largest wealth managers; (b) transactions focused on entering adjacent revenue pools, such as asset management, banking, retirement, or payments; and (c) transactions to acquire capabilities that will be key for growth—for example, direct indexing, tax solutions, or wealth tech.

While not all deals are accretive in value, the top 25 percent of deals achieve 8.5 percent excess TRS. Top acquirers are distinguished from the rest by two characteristics: the ability to embed M&A in their strategic planning process and a clear post-acquisition playbook, inclusive of an integration capability. Thinking through

programmatic M&A in the context of business strategy is essential for making accretive deals that contribute to both top-line growth and business value.

5. *Do you have a partnership strategy rooted in your business strategy?* When it comes to digital, data, and technology, it is impossible for any organization to stay ahead of the pack on every dimension, so a clear partnership strategy is crucial. In fact, many wealth management incumbents already rely on fintechs to gain access to better technology across the value chain—client acquisition, client front-end, portfolio management, point solutions on advisor desktops, cybersecurity, and cloud infrastructure, among others. Looking ahead, it is important for executives and their teams to be clear-eyed about which capabilities will be a source of sustainable competitive advantage and then to decide how to acquire those capabilities: build in-house, build in-house in partnerships with fintechs, or outsource.

Despite a modest dip in profits, the US wealth management industry has thus far come through the pandemic not only unscathed but with tailwinds from sustained demand for advice, potential upside of higher interest rates, the rise of new client segments, and the embrace of unprecedented levels and speed of innovation. As the industry moves toward the hoped-for postpandemic new normal, it faces near-term macroeconomic uncertainty but also meaningful opportunity.

Tomorrow’s successful managers will need to adapt their models to preempt the disruptions that lie ahead and adopt a new sense of purpose and innovation as they head into a period of growth.

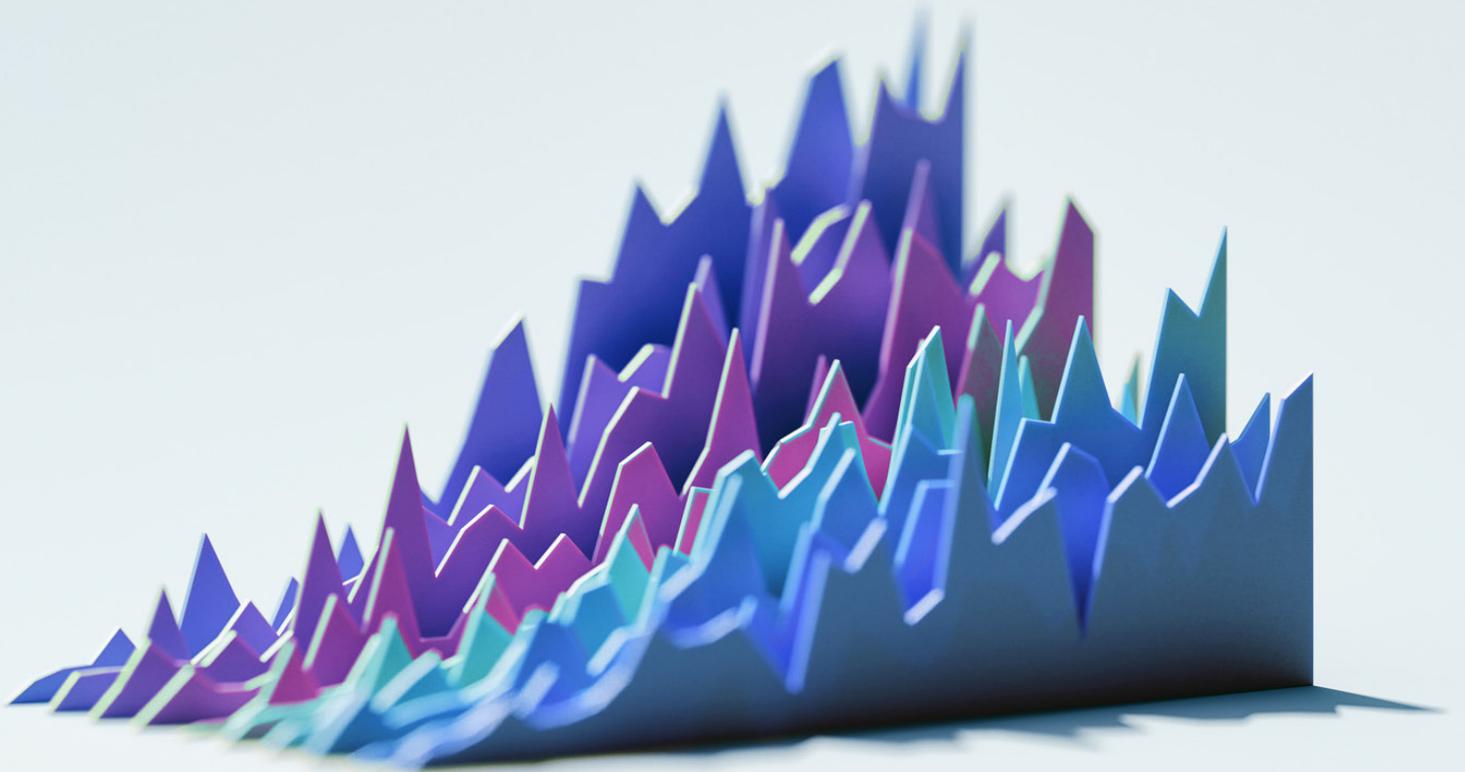
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It's time to become a digital investing organization

AI and other digital technologies are ushering in the next horizon of performance differentiation. Here's how to level up.

by Vincent Bérubé, Ghislain Gagné, Frédéric Jacques, and Marcos Tarnowski



The broad-based adoption of digital technologies has emerged as one of the most powerful and disruptive forces in industry over the past decade, driving a fourth industrial revolution in which entire sectors are being reshaped and business processes transformed.

As often happens with changes of this magnitude, those slow to join the fold have been left at a competitive disadvantage. We've now seen once-dominant incumbent organizations lose ground to their more digitized competitors in nearly every industry. In the asset-management space, there's little doubt that institutional investors face the same peril. Banking offers a glimpse of what institutional investors might face as nimble new fintechs offering mobile alternatives to services such as payments, loans, and deposits chip away at incumbents. Other large asset managers, such as pension plans and general accounts for insurance, are likely to experience disruptions and performance impacts if they remain behind the digital curve.

The good news is that we're still at the beginning stages of this new era for large investors. Those that embrace digital and analytics as necessary instruments to augment decision making will have an enormous advantage over those that continue to rely on personal judgment and incomplete data. Already, the adoption of digital technology at scale is creating a new breed of investors who are faster and better at identifying and evaluating opportunities.

In this article, we'll describe the nature of the opportunity for investors and explain how to get started—while avoiding common pitfalls.

Digital and analytics: Practically made for investors

Digital technologies profoundly alter how humans interact with each other, objects, machines, and systems and rewrite the division of labor between humans and machines. For investors, tasks performed from back to front offices can be streamlined by using digital applications.

Artificial intelligence and other advanced analytics stand at the forefront of digital. Such technologies

enable the analysis of massive amounts of data to generate predictive insights at a speed and scale well beyond what humans alone can achieve. Investors already are using analytics and various data sources, such as Bloomberg, to support their investment decision process, but many are only starting to leverage more advanced analytics powered by AI. The wide availability of ever-cheaper data and computing power means that AI can enable investors to analyze more data far faster than previously possible.

AI-enabled automation can also help investors perform repetitive tasks faster and at lower cost. Many investment processes are repeatable. Tedious, redundant analyses, for example, can now be carried out by computers, allowing humans to focus on what they do best: evaluating those machine-generated insights to challenge their investment theses and factor in idiosyncratic risks that AI will not capture.

The cost advantages of digital technologies increase the more they are used. Once the investment in technology has been made, organizations can expand the technology's use with zero marginal increase in costs. Developing the ability to generate fresh investment insights with greater efficiency will prove critical for investors to remain relevant and competitive in the years ahead.

Early returns from the field

While it's still early days, there is ample evidence that digital and analytics can provide investors with a competitive advantage. Early adopters are using analytics to support portfolio managers across multiple asset classes. Some firms are using AI to analyze hundreds of nonconventional data sources to help them derive a basket of stocks with a higher likelihood of outperformance. A study by McKinsey of more than 1,000 investors found that those leveraging analytics had a 5.3 percent gain in return on investment capital (ROIC) over those that relied on a more traditional approach.

In addition, there's evidence from adjacent sectors. Man Group, a UK-based hedge fund with \$154 billion in assets under management, is

at the forefront of using AI to generate returns. It is continuing to push the frontiers through the Oxford-Man Institute of Quantitative Finance (OMI), a research institute it co-founded with Oxford University in 2007. The OMI brings together experts from academia and industry in a wide variety of disciplines. They use AI, machine learning, and other technologies to generate insights into markets and develop new tools for financial decision making. In real estate, using AI to forecast rent at the street-corner level has led to stronger performance in data-rich markets such as the United States. During the COVID-19 crisis, even port-traffic recovery emerged as an area where AI was better suited to look at all available data to predict where and when traffic would resume.

Despite these successes, some investors shun new technologies because they are wed to the belief that making investment decisions or enhancing the value of a private equity investment is more art than science. Still others may fear the threat that AI poses to their jobs and compensation.

The reality is more nuanced. Successful use of digital and AI requires a clear understanding of the limits and strengths of the technologies—as well as the limits and strengths of the humans who must wield them. Both have essential roles.

Getting started—while avoiding common pitfalls

Realizing the full potential of digital and analytics requires a radical change to culture and mindset. Organizations must shift from a culture that thinks in terms of individual use cases and achieving immediate returns on technology investments to a culture in which entire investment and operational processes (such as hiring, performance evaluation, and general-partner-agreement compliance) are reengineered to fully leverage technology.

To reshape the organizational culture as well as the actual technology required for full-scale adoption of digital technologies, successful companies focus on strategy, capabilities, and execution (exhibit). There are pitfalls in each of these areas, and we call them out here so investment institutions can avoid them.

Strategy

While it's important to be strategic rather than tactical, that doesn't mean every part of the organization should be transformed immediately. To ensure impact is created early in the transformation, it is best to start with the transformation of a single business domain before moving to another part of the organization—a full portfolio such as value investing or corporate bonds, for example—where investing teams are already open to reconsidering their approach in order to deliver stronger performance. Although functions such as partner-relationship management, human resources, risk, or finance are also great candidates, demonstrating investment impact is more likely to galvanize the organization, build belief in the benefits of digitization, and create the excess returns required to fund future efforts.

Strategic pitfalls to avoid

Assuming leadership knows how to direct digitization efforts. Make sure decision makers get the training and background they need to lead the digitization effort effectively. Leaders with only limited technology literacy can have misconceptions about the power and potential of AI and other digital technologies, which can cause organizations to work on the wrong problems or adopt solutions that are already outdated. Executives must recognize that the risks of disrupting their internal investment processes with digitization are far lower than the risks of not adopting technology at all and losing their competitive advantage in the long run.

Setting the wrong goal. Many organizations misunderstand the real value of digital technologies and set about using it to replace humans rather than to enhance human decision making. On the other hand, sophisticated investors have seen their portfolio performance in equities improve by more than 50 basis points by allowing AI to identify a basket of stocks where portfolio managers should focus their attention. The right goal is most often to pursue digital and AI technologies as a means of human augmentation rather than replacement.

Exhibit

There are six common components to successful digital and analytics transformations.

Learnings based on McKinsey's experience at hundreds of digital and analytics transformations across sectors

Strategy



1. Strategy and vision

It takes hundreds of tech solutions to transform a large company; there are rarely silver bullets

Prioritize business domains, not use cases

Develop use-case-level road map for the priority business domains

Be clear on the business problems to be solved

Capabilities



2. Technology

Two core tech enablers are essential to scale:

- cloud-based data platform
- automated delivery pipeline (continuous integration and continuous delivery [CI/CD])



3. Data

Successfully managing and leveraging data is:

- a new discipline in most companies
- a journey or process
- possibly the only true source of competitive advantage



4. Talent

A superior digital-talent bench gives a competitive edge. To attract talent:

- rethink HR practices and the operating model
- train top management and develop analytics translators



5. Agile delivery

Getting agile right is more than just ping-pong tables

Successful companies develop a method they can reuse to create new solutions

Execution



6. Solution delivery and operating-model transition

For every \$1 invested in technology development, plan another \$1 for execution support

Solve for two discrete problems: adoption and operating-model change

Tracking impact can be more complicated because tech solutions cut across the enterprise

Getting too narrow. Some investors focus on addressing smaller, individual issues with software that isn't well-integrated into the overall investing process. As a result, they often end up launching dozens of small initiatives that, taken together, do not materially move the needle for the organization. Investment decision makers need to take a holistic, strategic view of the opportunities new technologies present.

Capabilities

To enable a long-term technology transformation, firms will need to set up the right internal capabilities (see sidebar, "Bringing leadership and practitioners into the process"). Scoring some early wins can inject momentum into the overall transformation, so these early efforts must be well supported. They should also fit into an overall strategic foundation that can ultimately support scaling of digital and analytics throughout the organization. Some of these capabilities include the following:

Sophisticated investors have seen their portfolio performance in equities improve by more than 50 basis points by allowing AI to identify a basket of stocks where portfolio managers should focus their attention.

- *Technology:* Technology tops the list of key capabilities. For at-scale digital deployment, technology should ideally be cloud based to enable agility and foster innovation. Firms also need tooling that can enable continuous solution delivery and post-deployment monitoring (such as MLOps).
- *Data:* The approach to data is also critical. Firms need a vision and strategy that provide visibility on the full life cycle of data, from acquisition to insight consumption, and a data architecture and data governance that are supported by IT.
- *Talent:* The new talent model is much more tech heavy, with teams of highly technical specialists guided by a few seasoned investors who have the judgment and experience to make the best use of the machine-generated insights. This requires new processes to recruit from a wider array of backgrounds. The revised HR strategy must adapt compensation and incentives for the differing needs and aspirations of tech candidates. For instance, as a systematic asset manager, Man Group invested in a broad range of talent from different scientific backgrounds. These recruits are fully integrated into

Bringing leadership and practitioners into the process

Success with digital and analytics will ultimately depend on whether leadership and practitioners buy into the new solutions and ways of working. Both groups should be part of the process—and receive specialized training as the first pilot ramps up.

Leaders: The executive team needs a common understanding of digital technology and its related terms. Training should also focus on helping leaders champion agile development projects, finding the optimal balance between guidance and autonomy to allow innovative yet practical ideas to flourish.

Core practitioners: For speed and efficiency, multiple core-practitioner cohorts (data scientists, data engineers, translators, product owners) should be trained in parallel so the organization has the resources to move to new opportunities over time. Delivering these trainings in mixed cohorts and regrouping the various roles to address real business problems will help the organization expand its pipeline of projects while building the necessary bench to accomplish the digitization journey.

The broader organization: From the start of the digitization journey, the central team—that is, the group responsible for driving the AI agenda and setting up the core analytical practices—should roll out an organization-wide digital-literacy program to help employees at all levels understand the rationale behind the effort and enable them to interact effectively with the central team to identify goals and end products.

investment teams, which means there is no clear distinction between technical (for example, data scientists) and investment (for example, portfolio managers) talent.

- *Agile*: Finally, to rapidly develop, test, and iteratively improve tech solutions, firms will need a new operating model that encourages deep customer input and collaboration with all key business functions. This means empowering delivery teams with quick decision making, adaptive learning, and greater autonomy.

Capability-building pitfall to avoid

Shiny-object syndrome. In some cases, investors get caught up in pursuing technology for its own sake, rather than leveraging a practical approach that is fit for purpose. Successful companies keep their eyes on the prize. Democratizing access to data, building interfaces for ease of consumption, embedding analytics, or using automation to focus high-performing resources on the tasks that add the most value will serve companies far better than building out the latest tech without a clear, practical application. Many investors overinvest in developing sophisticated AI models, for example, rather than weaving AI into the fabric of their organization by making code available and easy to use, driving adoption, and putting in place the capabilities, infrastructure, and data foundation needed to scale.

Execution

Adapting the organizational model to maximize adoption of technology by end users in the organization may be the most challenging part of a digital transformation, often representing half of the total effort and investment.

Doing so successfully involves three steps:

- Establish a robust protocol for rolling out analytics solutions to the front line by identifying

the best opportunities and co-developing solutions and adoption processes with the investment professionals.

- Define a framework for ongoing monitoring of analytics solutions to enable improvement as issues arise.
- Align key stakeholders to ensure accountability for reinforcing adoption and ownership of new processes lies with the business, not IT.

Execution pitfall to avoid

Leaving end users on the sidelines. The practice of putting frontline users at the center of technology delivery helps organizations seamlessly integrate insights from data and analytics into the investment process. For example, BlackRock's Systematic Active Equity team uses human insights, data, technology, and mathematics to drive adoption of digital and analytics tools across the core business processes and achieve better results for customers.

Industries are being fundamentally disrupted by digitization, and the investment space is no exception. However, basic digital technologies will eventually erode the scale advantage for investors, making speed the primary differentiator between competitors—speed that AI can help provide. There will likely be a dispersion of returns that favors players with AI-augmented workforces at the expense of those that continue to invest with less sophisticated tools. We believe a window of opportunity exists for investors to build both the foundational and advanced technological capabilities they need to be on the winning side. Now is the time to act.

Vincent Bérubé and **Marcos Tarnowski** are senior partners in McKinsey's Montreal office, where **Ghislain Gagné** and **Frédéric Jacques** are partners.

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Exploring investment themes

70

Highlights from McKinsey's
2022 sector research

85

Why private equity sees life
and annuities as an enticing
form of permanent capital

93

Digitally native brands:
Born digital, but ready
to take on the world

100

Climate risk and the
opportunity for real estate

108

Innovating to net zero:
An executive's guide
to climate technology



Highlights from McKinsey's 2022 sector research

Amid uncertainty, companies across industries are continuing to innovate, diversify and find new investment opportunities.



71	Advanced electronics	80	Healthcare systems and services
72	Aerospace and defense	81	Life sciences
73	Agriculture	82	Oil and gas
74	Automotive and assembly	83	Retail
75	Capital projects and infrastructure	84	Travel, transportation, and logistics
76	Chemicals		
77	Consumer		
78	Engineering, construction, and building materials		
79	Financial services		

Tackling inflation with active price management

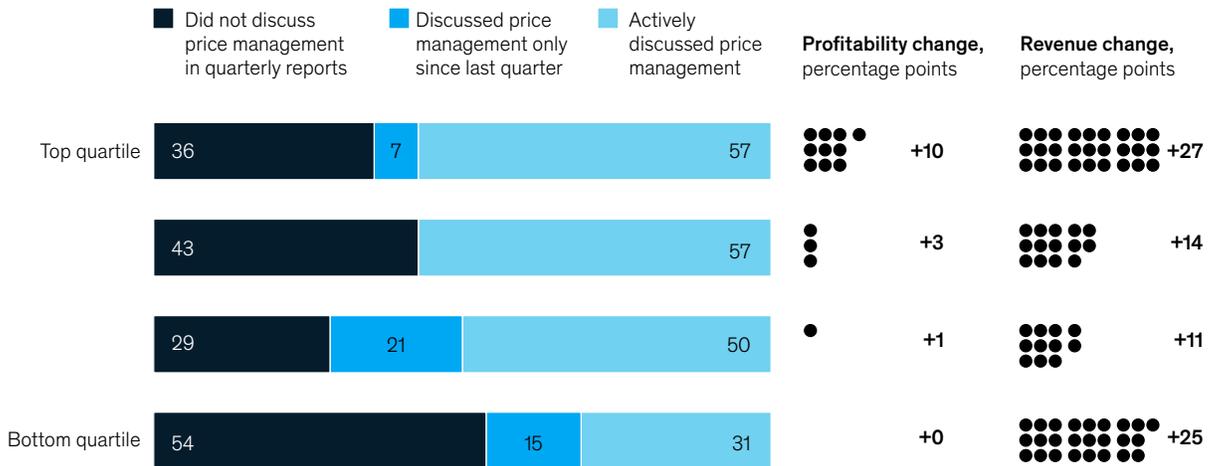
by Niels Adler and Nicolas Magnette

Rising inflation is prompting industrial players to pay greater attention to their pricing, cost, and sales management practices. According to McKinsey's analysis of 55 European B2B companies in the industrial sector, active price management techniques have boosted revenues and profitability over the past year. Among the top-quartile companies that improved their profitability and revenue the most during this period, more than 50 percent said they used active pricing management techniques while discussing quarterly results, including the use of determined language, such as "taking bold pricing action." For a successful pricing strategy, players should build their plans across the short-, medium- and long-term.

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Companies that increase profitability tend to engage in active price management.

Companies discussing price management in quarterly result presentations,¹ % share (n = 55)



¹Companies grouped into quartiles based on profitability improvement over past year.



Space investment is diversifying to new orbits and technologies

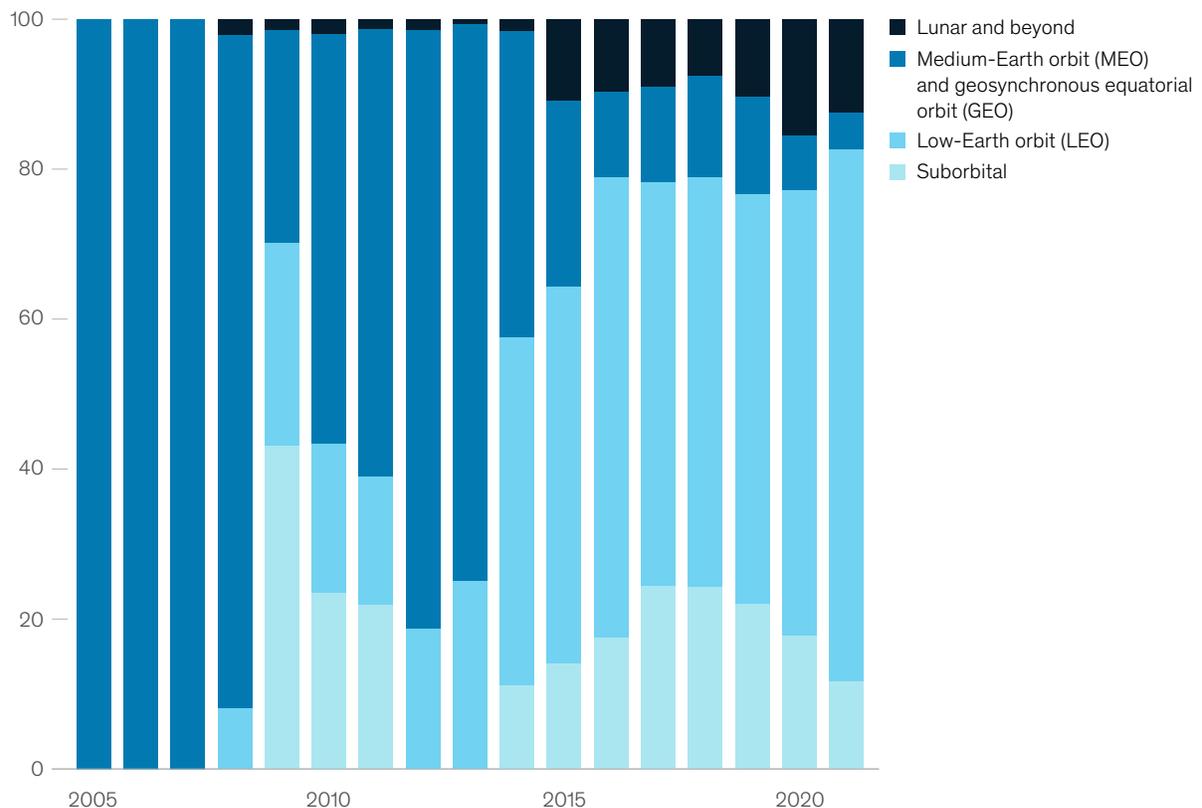
by Ryan Brukart, Jesse Klempner, and Brooke Stokes

Private investors are diversifying their exposure to space-related companies. Historically, a large portion of both private and government funding has gone toward satellites in medium-Earth orbit (MEO) or geosynchronous equatorial orbit (GEO) (which operates at a higher altitude) for purposes including GPS and TV coverage. Investors then expanded their focus to ventures in low-earth orbit (LEO). Today, there is growing interest in space ventures focused on orbits around the moon and those even farther from the Earth, with about \$1 billion in private investment going toward these initiatives in 2021. These ventures have varied areas of focus, from spacecraft components and technologies to mining, infrastructure, and robotics.

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Private funding is increasing for ventures involving lunar and beyond orbital regimes.

Share of private funding for space-related companies, by orbital-regime focus,¹%



¹Includes funding from space-related companies founded since 2000. Each company receiving funding was tagged by orbital-regime focus based on review of company's website and of public press; funding estimates were split between different orbital regimes where appropriate. Reflects three-year rolling average. Source: Capital IQ; company websites; Crunchbase; public press; McKinsey analysis



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Agriculture

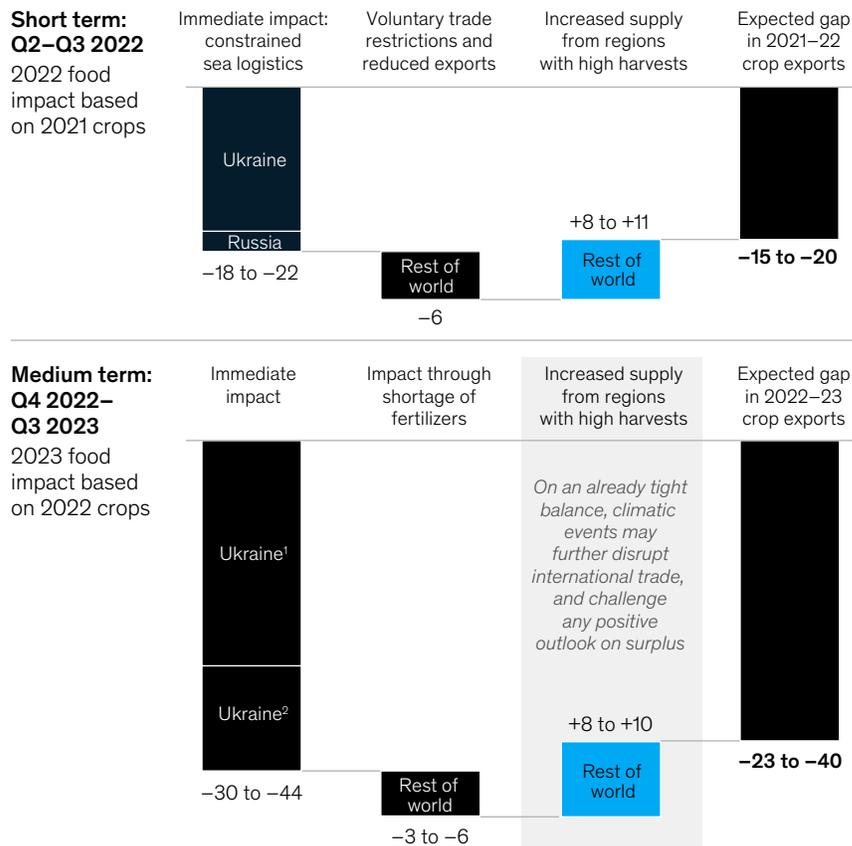
Global food supply faced converging risks in 2022; next year could be even harder

by Daniel Aminetzah, Artem Baroyan, Nicolas Denis, Sarah Dewilde, Nelson Ferreira, Oleksandr Kravchenko, Julien Revellat, and Ivan Verlan

The global food system depends on a carefully calibrated system in which six main growing regions supply the majority of the world's exported grain. The war in Ukraine— combined with early climate change impacts, trade restrictions, fertilizer shortages, higher energy prices, and other factors— has thrown the system into a state of high risk. In 2022, much of the deficit in exported grain was caused by logistical problems that trapped grain in Black Sea ports. Next year, there could be even greater deficits because grain has not been planted in parts of Ukraine, and suboptimal conditions may further decrease harvests in this key breadbasket region. Stakeholders should consider ways to create a more resilient method to feed the world, including by reducing waste and accelerating efficiency in the food system.

Global grain trade volumes are likely to drop by 5 to 10 percent by Q3 2023, due to both short- and medium-term factors.

Estimated annual crop export volume drop in relation to expected 2021 export baseline, million metric tons



Note: Analysis based on exports of wheat, corn, barley, and sunflower seeds.

¹Scenario in which conflict is limited in duration and scale, and Black Sea ports are unblocked.

²Scenario in which conflict is prolonged in duration beyond 2022, and Black Sea ports remain blocked.

Source: Bloomberg; interviews with agricultural companies (> 1 million hectares under management); Reuters; Ukraine national crop statistics; UN Food and Agriculture Organization; McKinsey ACRE advanced analytics

Unlocking the growth opportunity in battery manufacturing equipment

by Jakob Fleischmann, Dorothee Herring, Ruth Heuss, Friederike Liebach, and Martin Linder

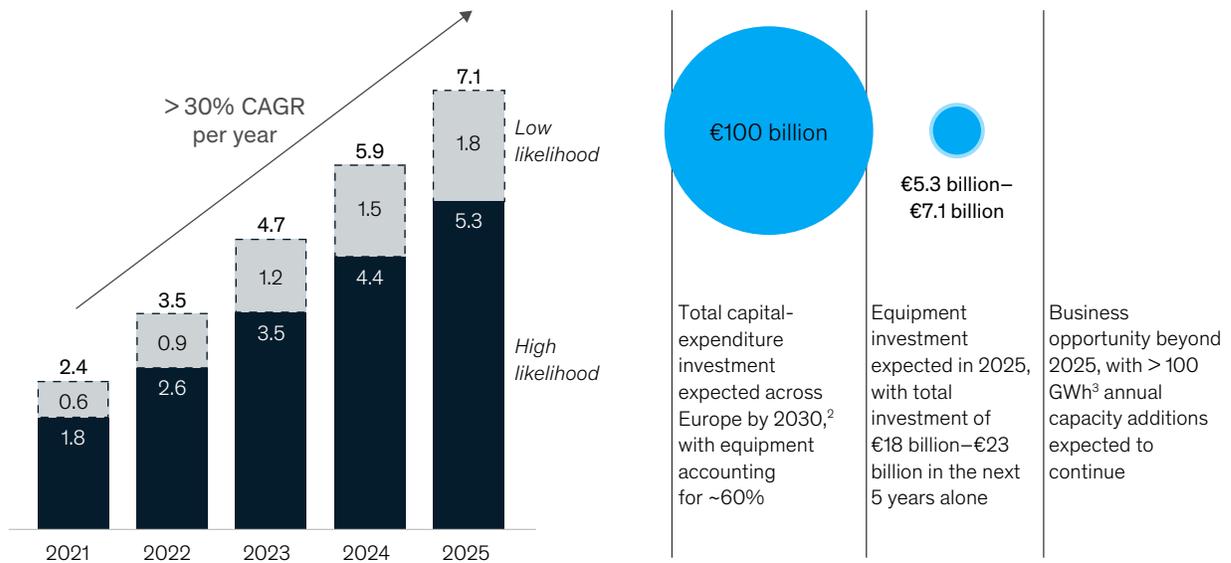
Europe's battery cell–machinery equipment industry is booming on the back of rising global demand for electric vehicles. By 2025, the annual business opportunity for the industry is estimated to reach €5 billion to €7 billion. To meet this demand, roughly 30 new battery manufacturing facilities would need to come online across Europe, requiring up to €100 billion in capital expenditures. Securing equipment supply and avoiding production delays, however, will be key success factors in ensuring businesses can make the most of this unprecedented opportunity.



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Ramping up European battery production will create an annual business opportunity of €5 billion to €7 billion for the equipment industry by 2025.

Total investment in battery cell manufacturing equipment, € billions per year¹



¹Revenues have been harmonized across years to average out fluctuations in annual capacity additions and other factors. Additional capacities beyond 2025 are expected to be announced.

²If all announced capacities are realized.

³Gigawatt-hours.

Source: McKinsey battery supply tracker (June 2021); McKinsey analysis



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Capital projects and infrastructure

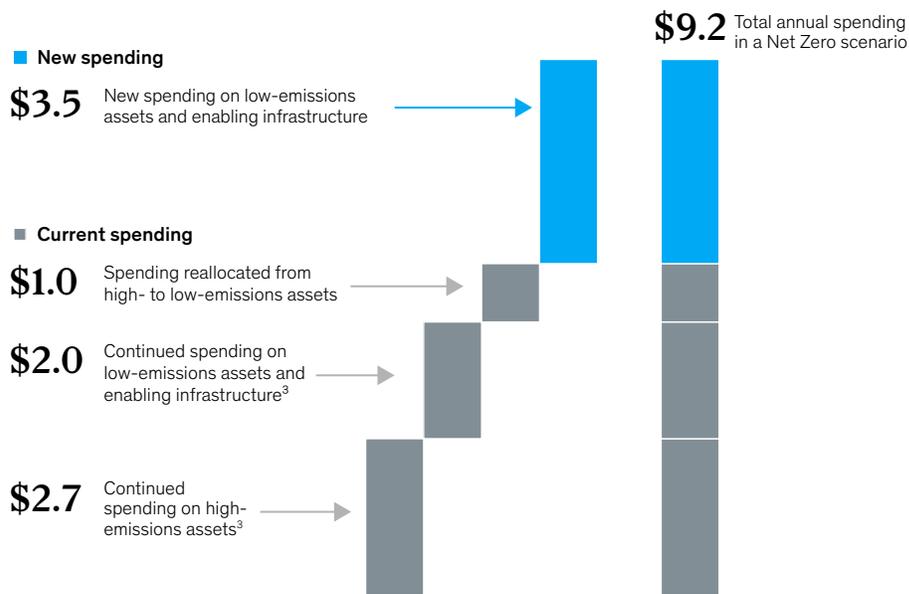
Is your capital strategy ready for the 21st century's first big investment wave?

by Steffen Fuchs, Homayoun Hatami, Tip Huizenga, and Christoph Schmitz

The magnitude is unprecedented: between 2022 and 2050, roughly \$9.2 trillion in annual average spending will be required to renew, upgrade, and build physical assets to meet the world's decarbonization and sustainability goals. In a net-zero 2050 scenario, mobility, power, and buildings require the most capital spending. Successful implementation of such a colossal capital management strategy will be challenging. Organizations will need to address supply chain inefficiencies; outdated project delivery systems; and shortages of labor, equipment, and raw materials. The solution partly lies in adopting a CEO-led approach that focuses on deploying advanced analytics for better capital planning.

Spending on physical assets for energy and land-use systems in the NGFS Net Zero 2050 scenario would rise by about \$3.5 trillion annually more than today.

Annual spending on physical assets for energy and land-use systems¹ in a Net Zero 2050 scenario,² average 2021–50, \$ trillion



¹We have sized the total spending on physical assets in power, mobility, fossil fuels, biofuels, hydrogen, heat, CCS (not including storage), buildings, industry (steel and cement), agriculture, and forestry. Estimation includes spend for physical assets across various forms of energy supply (eg, power systems, hydrogen, and biofuel supply), energy demand (eg, for vehicles, alternate methods of steel and cement production), and various forms of land use (eg, GHG-efficient farming practices).

²Based on the NGFS Net Zero 2050 scenario using REMIND-MAgPIE (phase 2). Based on analysis of systems that account for ~85% of overall CO₂ emissions today. Spend estimates are higher than others in the literature because we have included spend on high-carbon technologies, agriculture, and other land use, and taken a more expansive view of the spending required in end-use sectors.

³Our analysis divides high-emissions assets from low-emissions assets. High-emissions assets include assets for fossil fuel extraction and refining, as well as fossil fuel power production assets without CCS; fossil fuel heat production, gray-hydrogen production; steel BOF; cement fossil fuel kilns; ICE vehicles; fossil fuel heating and cooking equipment; dairy, monogastric, and ruminant meat production. Low-emissions assets and enabling infrastructure include assets for blue-hydrogen production with CCS; green-hydrogen production using electricity and biomass; biofuel production; generation of wind, solar, hydro-, geothermal, biomass, gas with CCS, and nuclear power along with transmission and distribution and storage infrastructure; heat production from low-emissions sources such as biomass; steel furnaces using EAF, DRI with hydrogen, basic oxygen furnaces with CCS; cement kilns with biomass or fossil fuel kilns with CCS; low-emissions vehicles and supporting infrastructure; heating equipment for buildings run on electricity or biomass, including heat pumps; district heating connections; cooking technology not based on fossil fuels; building insulation; GHG-efficient farming practices; food crops, poultry and egg production; and land restoration. Source: McKinsey Center for Future Mobility Electrification Model (2020); McKinsey Hydrogen Insights; McKinsey Power Solutions; McKinsey–Mission Possible Partnership collaboration; McKinsey Sustainability Insights; McKinsey Agriculture Practice; McKinsey Nature Analytics; McKinsey Global Institute analysis



Chemicals

Cracking the growth code in chemicals

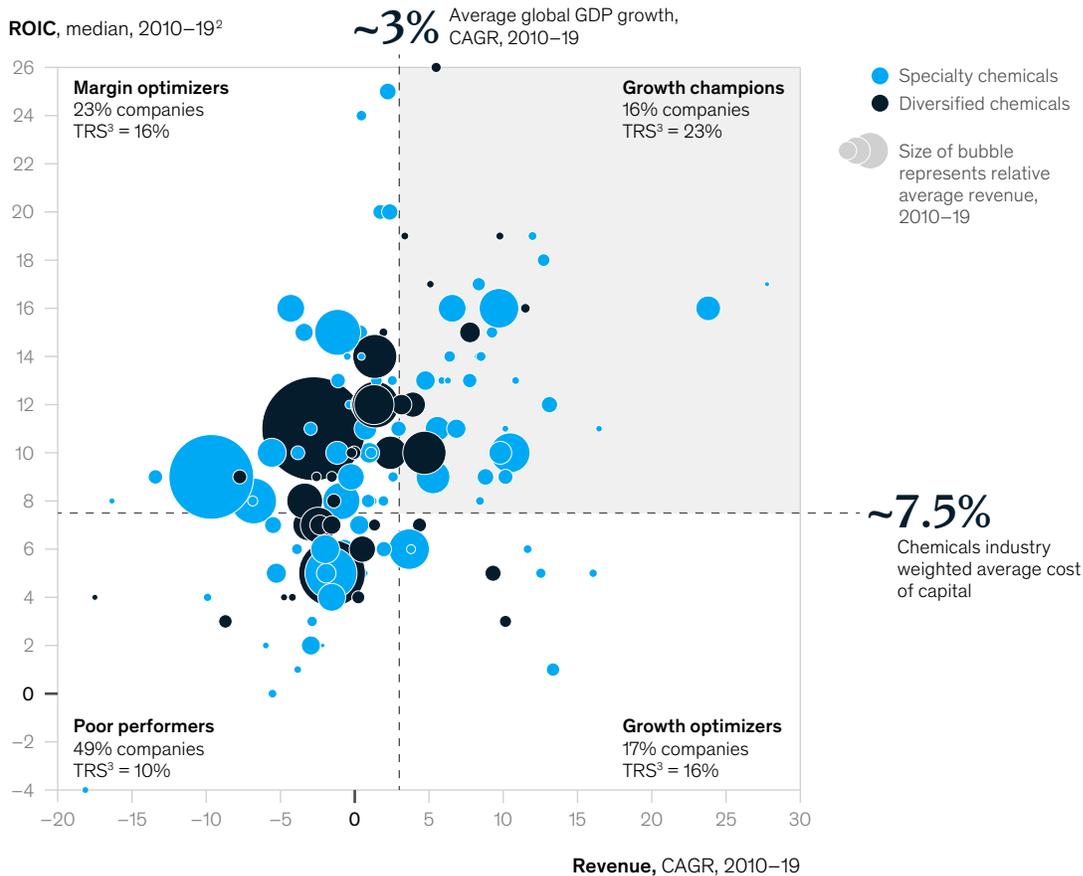
by Siddhant Gupta and Ryan Paulowsky

Chemical companies need to rethink strategy. Despite high demand from emerging markets, many diversified and specialty manufacturers are not achieving outsize returns or consistent revenue growth. Only 16 percent of chemical companies—the growth champions—managed to grow above global GDP growth rates while delivering an ROIC [return on invested capital] higher than the chemical industry’s weighted average cost of capital. Slowing market momentum post-COVID-19 risks tempering growth more. Chemical companies need to ramp up their omnichannel strategies, invest in digital and analytic capabilities, and reevaluate their contracting strategies to provide better protection against inflationary pressures.

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Achieving consistent growth has been a challenge for most chemical companies.

Top specialty and diversified players (n = 151)¹



Note: Figures may not sum to 100%, because of rounding.
¹Excluding 25 companies who exited the market during 2015–19.
²ROIC for each year during 2010–19 above average ROIC.
³Total return to shareholders.
 Source: S&P Capital IQ



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Consumer

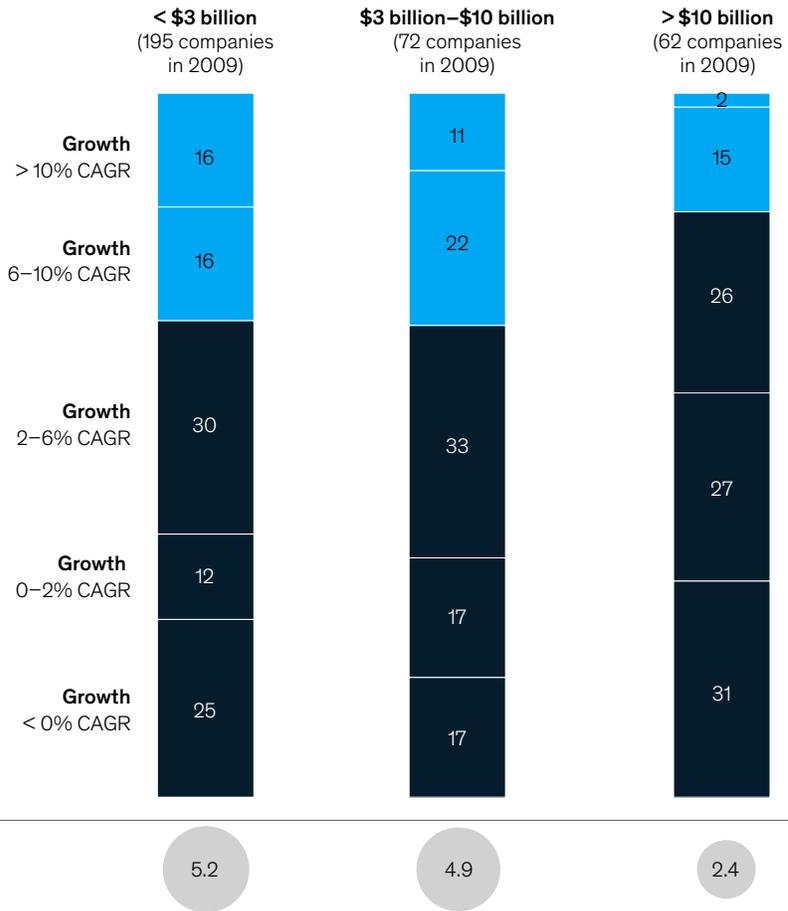
Three pathways to fast and profitable growth in the consumer sector

by Jordan Bar Am, Simon Land, Duncan Miller, René Schmutzler, and Gage Wells

Achieving continuous, profitable growth in the consumer sector amid continuing inflation and supply chain challenges is not easy. Size matters. Between 2009 and 2019, smaller companies (with \$300 million to \$3 billion in annual revenue) grew fastest. On the other hand, companies with more than \$10 billion in annual revenue faced greater challenges and grew at only 2.4 percent. Companies that have outperformed, both in terms of rapid growth and expanded margins, typically benefited from the following strategies: expanding the company's core, entering into new categories and geographies, and launching disruptive businesses.

Rapid growth in the consumer sector is rare, with faster growth typically coming from smaller and midsize companies that have headroom to grow.

Share of consumer companies, by revenue CAGR,¹ 2009–19, % (n = 329)²



¹Revenue growth sales calculated in nominal US dollars. Figures may not sum to 100%, because of rounding.

²Consumer companies based in Europe and the US with 2009 revenues greater than \$300 million, but inclusive of global consumer-packaged-goods companies with large businesses in Europe and the US (ie, Amorepacific, Gruma, Grupo Bimbo, Kikkoman, JBS, Shiseido).

Source: Public financial disclosures



Engineering, construction, and building materials

The building products industry is ripe for innovation

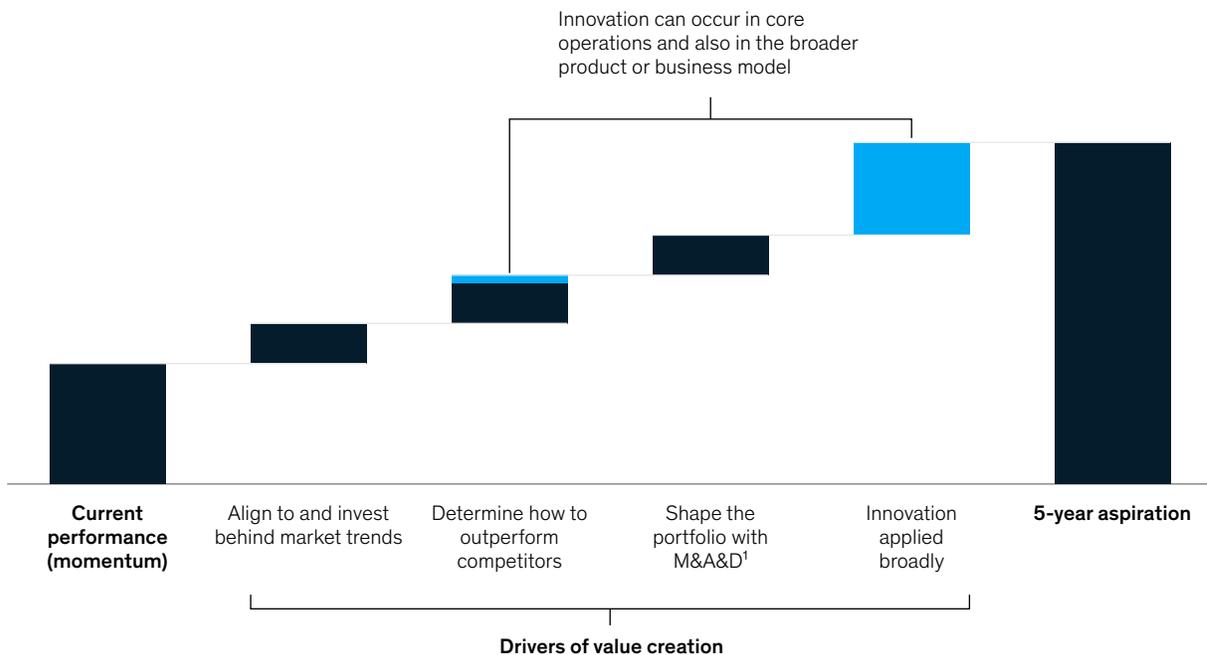
by Matt Bereman, Jose Luis Blanco, Brendan Fitzgerald, Imke Mattik, and Erik Sjödin

The building products industry has been fraught with supply chain disruptions, labor shortages, and raw-materials price volatility. Our 2022 global survey of more than 500 industry players revealed that many executives view investing in innovation, digital transformation, and R&D as key differentiators. But change is hard—and harder for some than others. To stimulate growth and avoid getting left behind due to these trends, leaders should focus on key value creation drivers. These include setting clear targets for innovative growth, doing routine interventions on cost programs, implementing marketing and sales initiatives, and developing a more agile approach to resource allocation.

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Drivers of value creation can be categorized by routine interventions and more ambitious moves like M&A and innovation.

Illustrative chart of how value-creation drivers can increase a company's value, \$



¹Mergers, acquisitions, and divestitures.
Source: McKinsey analysis

Creating value and finding focus in the insurance industry



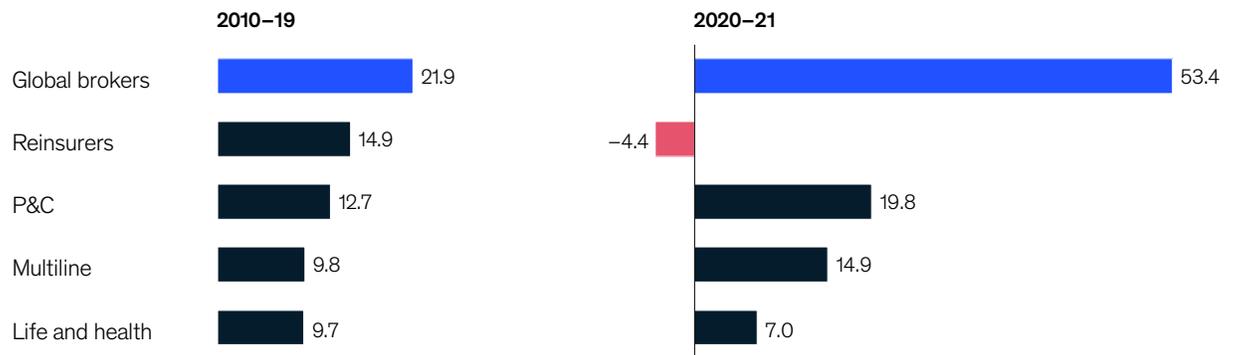
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by Pierre-Ignace Bernard, Stephan Binder, Alexander D'Amico, Henri de Combles de Nayves, Kweilin Ellingrud, Bernhard Kotanko, Philipp Klais, and Kurt Strovink

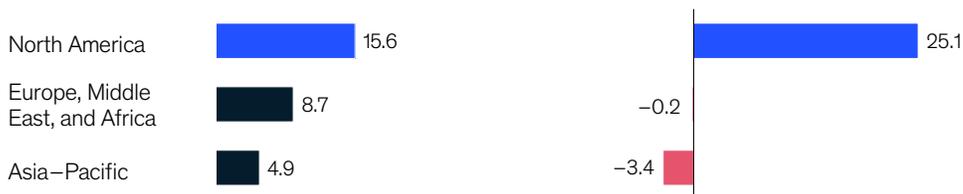
2021 saw a rebound in the global insurance industry's premium growth and profits, but the recovery was not uniform across regions and insurance segments. According to our Global Insurance Report findings, brokers have emerged as one of the clear winners in the industry, demonstrating the highest TSR compared to other segments in the insurance value chain between 2020 and 2021, as well as the preceding ten years. Regionally, North America has produced the best premium growth, profits, and shareholder returns, with the 2021 performance attributed to strong vaccine rollouts and the resumption of activities.

Brokers and North American insurers produced the best returns in the past decade.

Annualized TSR by line of business, %



Annualized TSR by geography, %



Note: The following sectoral indexes have been considered: Refinitiv Global Reinsurance Index, S&P Global 1200 Insurance Brokers TR Index, S&P Global 1200 Life & Health Insurance TR Index, S&P Global 1200 Multiline Insurance TR Index, S&P Global 1200 Property & Casualty Insurance TR Index, STOXX Asia/Pacific 600 Insurance Index, STOXX Europe 600 Insurance Index, STOXX North America 600 Insurance Net Return Index.
Source: Bloomberg; Capital IQ; Refinitiv Eikon



Healthcare systems and services

Profit pools are shifting in the US healthcare industry

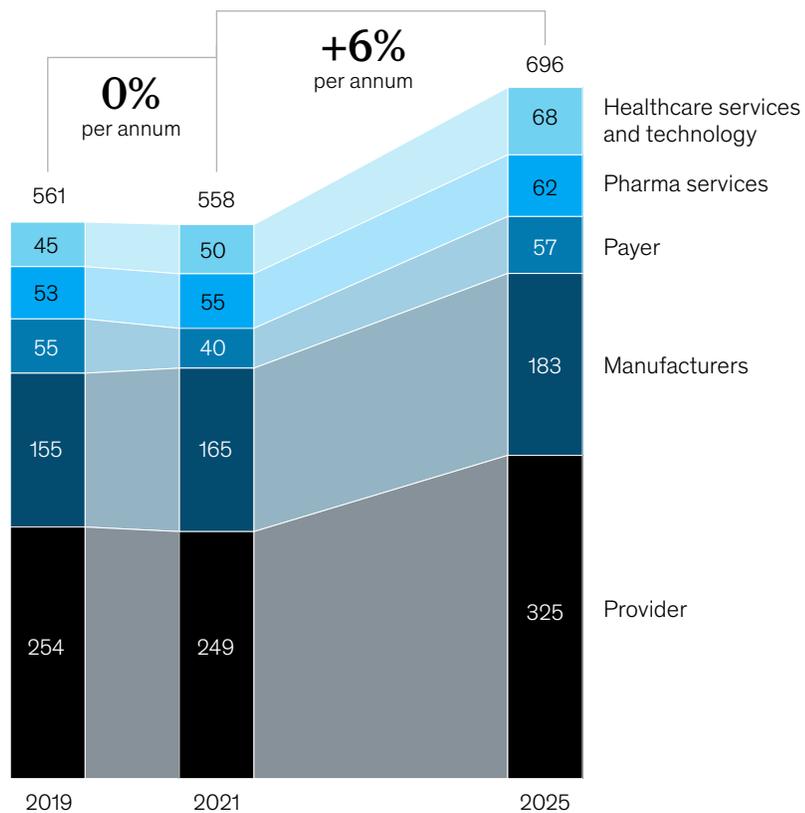
by Shubham Singhal and Neha Patel

While the growth outlook for the US healthcare industry remains positive, certain segments are poised to outperform between now and 2025. The overall industry is expected to grow at 6 percent per year during this period, with payers and providers growing the fastest. For the payer segment, the profit pool is likely to shift toward government segments due to rapid growth in the 65-and-up population and increased adoption of Medicare Advantage. Positive outlook for providers is also driven by the aging population, in addition to the pandemic-triggered shift in care delivery services and nonacute sites of care.

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Healthcare profit pools are expected to show a strong recovery post-COVID-19, with payer and services segments growing fastest.

Projected healthcare EBITDA¹ across segments, 2019–25, \$ billion



¹Earnings before interest, taxes, depreciation, and amortization. Source: McKinsey Profit Pools Model

What are the biotech investment themes that will shape the industry?

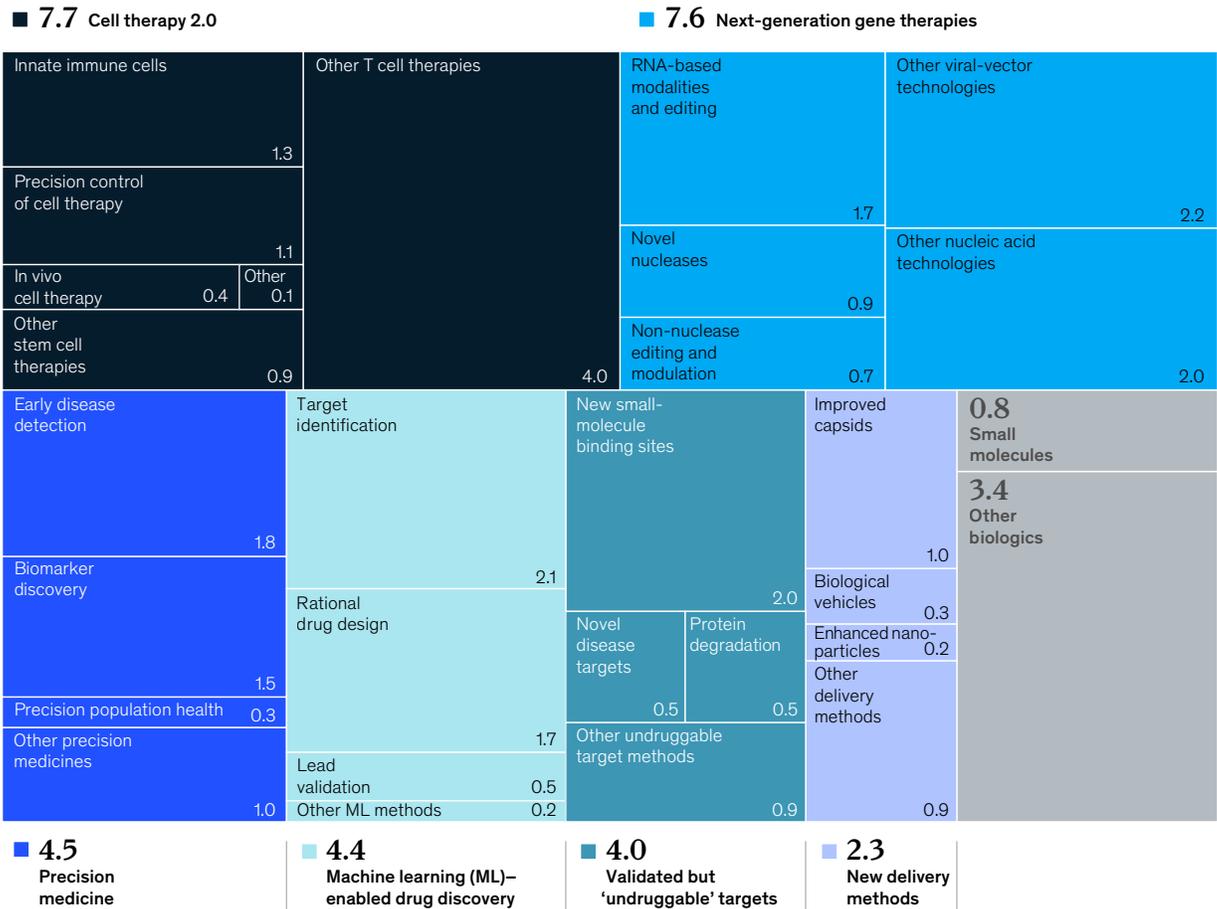
by Olivier Leclerc, Michelle Suhendra, and Lydia The

Until last year, venture capital (VC) companies were investing substantially in biotech start-ups using innovative platform technologies to address patients' unmet needs. This industry segment received more than two-thirds of the total \$52 billion VC biotech funding from 2019 to 2021. Investor interest also surged in cell therapy 2.0, next-generation cell therapies, precision medicine, and other biotech platforms. This increased capital allocation has the potential to positively shape long-term drug development if biotech companies are able to successfully weather ongoing macro challenges, including slower economic growth, higher inflation, and rising interest rates.

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Venture capital funding in biotech companies was driven by innovative platform technologies.

Seed to series C¹ VC funding in privately held biotech companies, by platform technology, 2019–21, \$ billion



Note: Figures may not sum, because of rounding.
¹Deals > \$10 million in seed to series C in privately held companies during 2019–21; filtered for “biotechnology” industry; excludes contract and research services, industrial biotechnology, and food/agriculture.
 Source: McKinsey analysis based on PitchBook, Inc., data; has not been reviewed by PitchBook analysts



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Oil and gas

Accelerating the energy transition requires more capital allocation

by Tamara Gruenewald, Jesse Noffsinger, Ole Rolser, Namit Sharma, Bram Smeets, Linda Tiemersma, Christer Tryggstad, Jasper van de Staaij, and Markus Wilthaner

The war in Ukraine has sent energy markets haywire. Amid all the volatility, some long-term trends—particularly the push for decarbonization—continue to develop. As countries transition to a low-carbon economy, substantial investments will be needed to support their emission-reduction goals. According to our Global Energy Perspectives 2022 report, across sectors, annual investment in energy supply and production is expected to double by 2035 to reach \$1.5 trillion to \$1.6 trillion. Decarbonization technologies are projected to make up more than a fourth of these total global investments. Despite their growth potential, however, the business models and revenue streams in a decarbonized system continue to remain uncertain.

Energy may attract increasing investment, with most growth being in RES and decarbonization technologies.

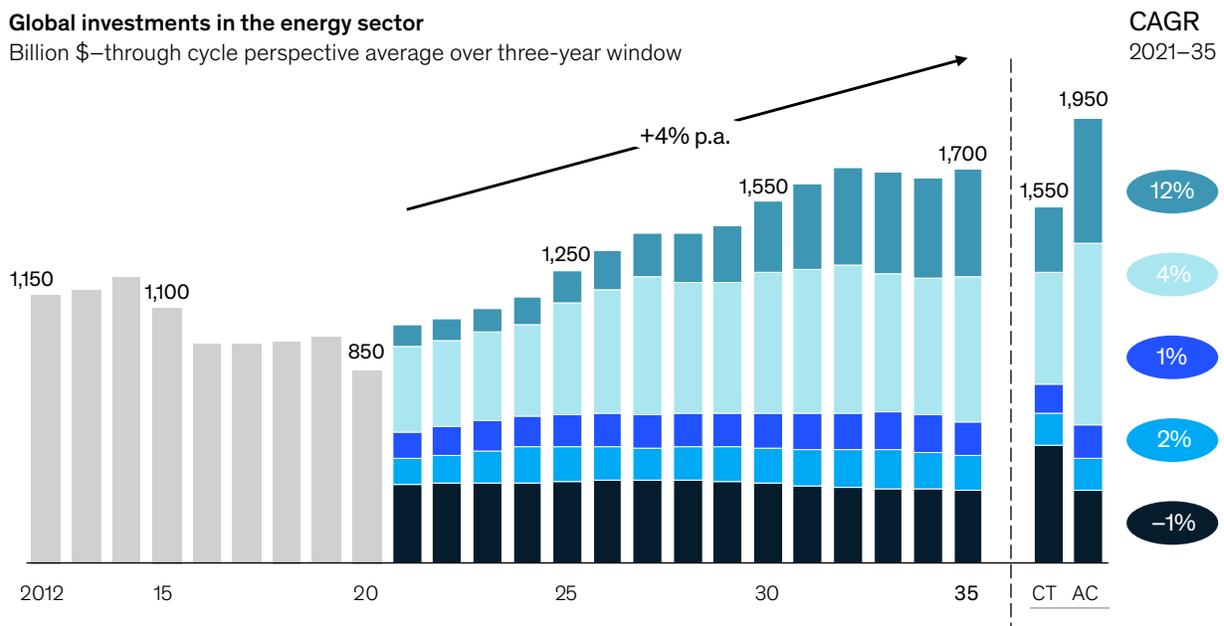
Despite decline in underlying fossil-fuel demand, investments in O&G are expected to remain stable

Further Acceleration⁴

Historical Decarbonization Technologies¹ Power Renewables² Power Conventional³ Gas Oil

Global investments in the energy sector

Billion \$—through cycle perspective average over three-year window



Note: This analyses was conducted before the Ukraine invasion in February 2022.

¹Includes sustainable fuels; carbon capture, utilization, and storage; hydrogen; and electric-vehicle charging.

²Includes solar, onshore wind, offshore wind, hydro, and other.

³Includes coal, gas, nuclear, and other.

⁴For the O&G segments the 2021 Accelerated Transition Scenario is used in combination with Further Acceleration and Achieved Commitments, and the 2021 Reference Case Scenario with Current Trajectory.



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Retail

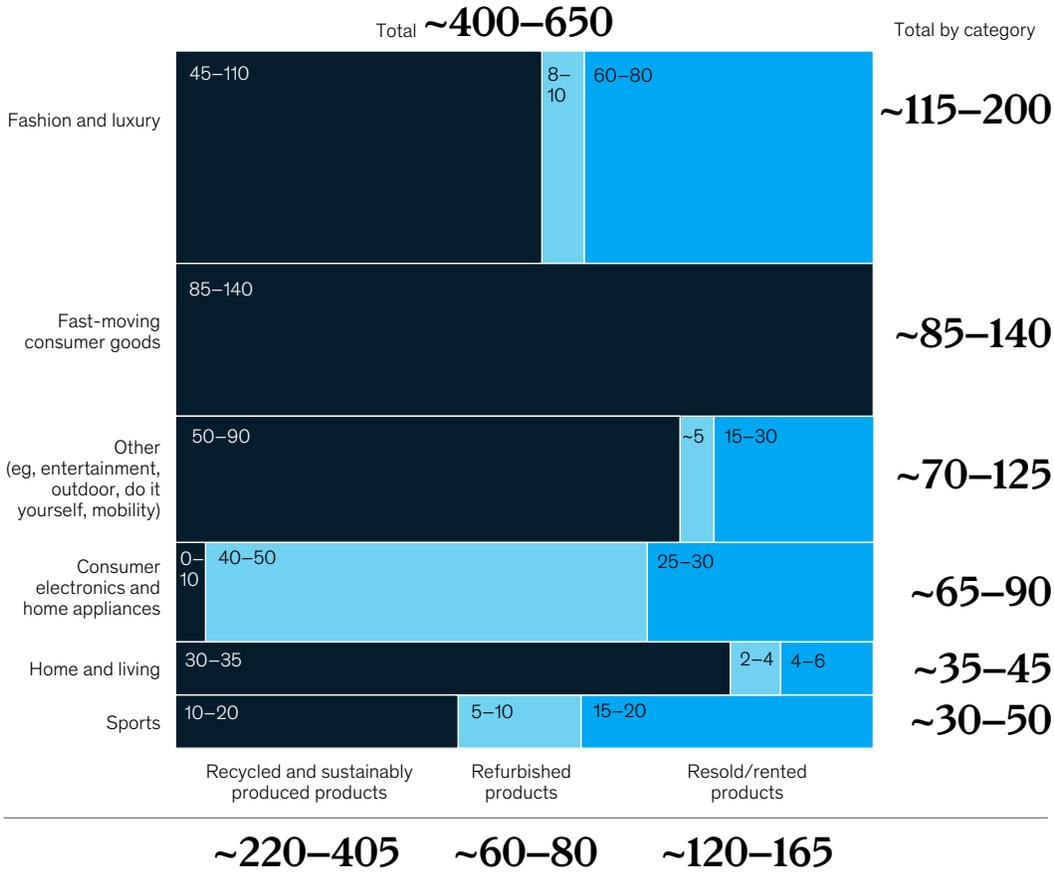
Playing offense on circularity can net European consumer goods companies €500 billion

by Sebastian Gatzler, Stefan Helmcke, and Daniel Roos

The European consumer goods industry is witnessing rapid growth in the demand for circular products, led by sustainability-conscious shoppers and regulation. Beyond the obvious environmental benefits, there is also a strong business case for companies—particularly in the fast-moving consumer goods, fashion and luxury, and electronics segments—to promote recycled, refurbished, and reused goods. To capitalize on this value creation potential, companies can develop greener supply chains and operations, calibrate portfolios toward high-demand circular products, and command appropriate green premiums.

By 2030, European circular-economy product segments will grow at around 10 to 15 percent annually to reach around €400 billion to €650 billion.

Estimated 2030 European circular-economy market size, by consumer goods category,¹ € billion



¹Total European consumer goods market in 2030: €1,700 billion (low); €1,800 billion (high). Source: Euromonitor; Statista; McKinsey analysis



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Travel, transportation, and logistics

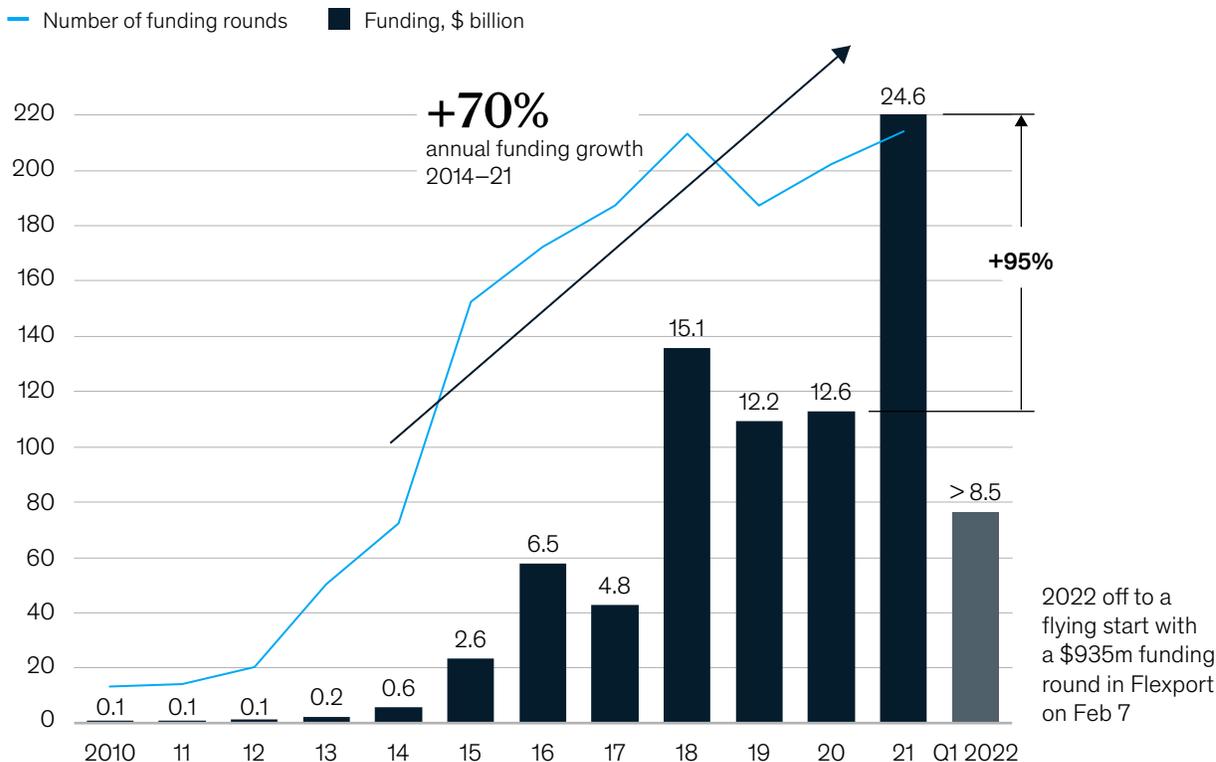
Startup funding in logistics is the next big investment opportunity

by Ludwig Hausmann, Maite Pena-Alcaraz, Jaron Stoffels, Max Wiest, and Tobias Wölfel

Investors are exploring new and relatively untapped growth areas within the highly sought-after logistics industry. Funding for logistics start-ups almost doubled in 2021, with last-mile delivery businesses, visibility and intelligence providers, and road-freight marketplaces receiving the largest share of inflows. These areas of the logistics value chain gained global attention amid the disruption triggered by the COVID-19 pandemic. While only a few startups have scaled up and achieved profitability so far, more are likely to grow into mature disruptors over time. For incumbents to stay competitive, digitization will be key.

Funding in logistics startups has increased dramatically and almost doubled from 2020 to 2021.

Total funding and number of funding rounds, 2010–21



Source: CB Insights; Crunchbase, Pitchbook, company websites

Why private equity sees life and annuities as an enticing form of permanent capital

Private acquisitions of in-force books are growing. Here's a playbook for those considering market entry, those already in, and insurers wondering how to respond.

by Ramnath Balasubramanian, Alex D'Amico, Rajiv Dattani, and Diego Mattone



Permanent capital—investment funds that do not have to be returned to investors on a timetable, or at all—is, according to some, the “holy grail” of private investing.¹ Permanent capital owes its exalted status to the time and effort that managers can save on fundraising, and the flexibility it provides to invest at times, like a crisis, when other forms of capital can become scarce.

Permanent capital can take many forms, including long-dated and open-ended fund vehicles. The balance sheet of a life and annuities company is one form of permanent capital that has drawn much attention. In 2021, private investors announced deals to acquire or reinsure more than \$200 billion of liabilities in the United States. Such investors now own over \$900 billion of life and annuity assets in Western Europe and North America. Assuming the pending deals close successfully, private investors will own 12 percent of life and annuity assets in the United States, totaling \$620 billion, and represent more than a third of US net written premiums of indexed annuities. All five of the largest private equity (PE) firms by assets have holdings in life insurance, representing 15 to 50 percent of their total assets under management. By our count, 15 alternative asset managers have entered the market, or stated their intent to do so. Insurance carriers are also benefiting from all the attention: many of the largest insurers have sold legacy books to private buyers, typically to improve their return on equity and to free up capital for reinvestment or return to shareholders. For some public carriers, these transactions have generated near-instantaneous expansion of their price–earnings multiple.

The trend is not new: private investing in insurance dates back more than 50 years to Berkshire Hathaway’s acquisition of National Indemnity in 1967. As that example shows, many forms of insurance beyond life and annuities can serve as permanent capital, including specialty and property and casualty (P&C). In this article, however, we’ll focus on the reasons why many PE firms have concluded that life insurance and annuities

represent a once-in-a-generation opportunity. We’ll also look at the requirements for PE firms on the sidelines that want to enter the market, discuss some overlooked ways that PE owners can create value, and highlight some implications for life insurers as they consider either selling a portion of their book of business or emulating and competing with this potent new industry force.

Why PE investments in life insurance are growing

The core attraction is straightforward. The balance sheets of life and annuities companies are well stocked with assets (to match the liabilities of future payouts and indemnities), but until payout, these assets need to be invested to generate returns. And in many cases, the cost of servicing the liabilities is significantly lower than the potential investment return. The spread represents an attractive margin.

The most common way for general partners (GPs) to capture the spread is to set up an insurer that they control through an equity investment (sometimes in conjunction with other investors, such as sovereign-wealth funds) and then acquire or reinsure books from other insurers. To ensure they earn the required returns on acquired books, these GPs typically influence the strategic asset allocation (SAA) and apply their investment management capabilities to earn alpha on some of the asset classes. The benefits to the GP in this case are threefold:

- First, in our experience, executing the value-creation playbook can generate *internal rates of return (IRRs) of 10 to 14 percent*. Investment returns have substantially lifted return on equity (ROE) in recent years. GPs achieve stronger investment returns largely by rotating the asset allocation into classes that are higher risk and higher return (while still meeting regulatory and rating agency guidelines) and achieving higher alpha within these asset classes. Consider what US PE-backed insurers have accomplished:

¹ Stephen Foley and Henny Sender, “Permanent capital: Perpetual cash machines,” *Financial Times*, January 4, 2015.

one analysis found that they generated 62 basis points (bps) higher investment yield than the industry average.² Within three years of acquisition, 80 percent of these insurers had increased their allocation to asset-backed securities (primarily collateralized loan obligations), and over half of their investments were in private loans (compared with 37 percent for the industry). Many PE firms have privileged, at-scale capabilities to originate higher risk-return assets and deliver excess returns. What's more, the approximately ten times asset-to-equity ratio typical of insurers amplifies the impact of strong investment performance.

A few other factors also contribute to healthy IRRs. For one, disciplined owners are often able to operate the business more efficiently and effectively, as we discuss below. In addition, for some books like variable annuities, public valuations appear to be lower than private valuations. As such, public investors may be wary of the volatility and opaque risk profile, raising the issue of whether such books are better suited to private ownership.

- Second, investing these assets provides a stable base for GPs *to rapidly build their alternative credit capabilities*. Credit investing is a strategic growth area for many firms at a time when PE markets are becoming more competitive. Acquiring a life book immediately provides long-term assets for the firm's credit arm to invest. It's a much faster way to reach scale and significantly less onerous than raising several credit funds. Depending on the structure of the vehicle, this can provide a significant source of fee-related earnings, which are more resilient to market fluctuations and more stable than carried interest. In particular, PE-backed insurers typically use structured credit products as core assets in their life insurance books. Origination of these asset classes is reaching record levels. For example, collateralized loan obligations, a core asset class for PE-backed insurers, are now a \$760 billion market.

- Finally, life insurance offers *the potential for scale*. Traditional life liabilities in Europe total €4.5 trillion; in the United States, life and annuity insurers carry \$4.5 trillion of assets on the general account, with an additional \$1.5 trillion in separate variable-annuity liabilities, and there are \$3 trillion of private-sector defined-benefit liabilities. Even after many large PE acquisitions, a huge supply continues to be available, allowing PE firms that build insurance capabilities to scale and take full advantage of this opportunity.

Another model that some GPs follow is a partnership or outsourced chief-investment-officer (OCIO) model, in which they work with incumbent insurers to manage a portion of their assets for the long term and take only a limited equity stake, or none at all. In this case they still receive the benefits of scaling their credit capabilities, as a high-performing OCIO operation can attract other insurers looking to outsource investment management. This also provides a steady source of fee-related earnings, which can drive higher valuations for the GP. And as a strategy, this too has potential to be scaled, as other insurers seek higher allocations to these high-yielding asset classes.

Sellers are willing

Put it all together, and it's clear why life insurance is attractive to PE buyers. Further fueling the market is insurers' willingness to sell: some see an opportunity to *shift strategy and move into more attractive businesses*; others think they can deliver greater value by exiting these books and *returning the capital to shareholders*. One example of the strategic shift is the move by many insurers to a capital-light, fee-based business model (such as investment management and recordkeeping) in structurally advantaged value pools in their domestic markets (for example, in defined-contribution pensions in which assets are growing at 6 to 8 percent annually across Europe and the United States). Similar to GPs with strong fee income in their revenue mix, insurers with a high proportion of fee earnings will typically trade at higher valuations (often nine to 12 times P/E ratio,

² *Insurance companies remain prime targets for private equity*, A.M. Best, July 1, 2021.

or 1.1 to 1.7 times book value) than those in capital-intensive businesses (usually five to eight times, or less than 1.1 times book value). Selling a life back book can provide the needed capital to pivot quickly into a new business, and investors are supportive of such moves. For example, one broad-based US player divested its closed block of variable annuities to reduce the volatility of earnings and refocus on capital-light businesses. Investors responded well: over the subsequent three years TSR outperformed the life index by ten percentage points. The carrier's price-to-book (PB) ratio rose from 1.2 to 1.6 times, at a time when the broader industry's PB ratio fell from 1.3 to 1.0 times.

Even as the capital-light model has gained favor, the traditional business has become less attractive. Many insurers' *earnings on in-force blocks have come under pressure*, as guarantee rates to policyholders are still as high as 150 to 400 bps in some markets, while yields on bonds have declined by 150 to 300 bps since 2010–11. Naturally, this has strained capital as insurers have had to adjust their reserves to reflect future earnings expectations. An average insurer reinvests about 12 percent of its assets annually, so this profitability challenge becomes increasingly acute every year. PE buyers are subject to the same pressures, of course, but with their different approaches to investment and operations, they are better able to overcome the costs of the capital requirements.

In addition, *operational and IT issues* have continued to challenge profitability and require significant investment and management attention to address. For example, migrating legacy policy-administration systems and investing in automation can be attractive in the medium term but require careful management to prevent technical or servicing issues.

In short, opportunity abounds. But how to take advantage? The playbook varies for PE firms considering an acquisition, those that have owned a life book for some time, and insurers.

Market entrants: How to begin

As so many PE firms have acquired insurance assets, would-be entrants and firms looking to scale their nascent operation may find the market more complicated than it once was.

As always, the approach starts with strategy. PE firms must first get clear on their strategy for insurance investments, choosing from a spectrum that ranges from a one-off opportunistic play to be sold in several years to the foundation for a future platform—and a source of permanent capital. The choice of strategy has material implications down the line, on whether or not to insource IT and operational capabilities; talent strategy; target geographies (where market dynamics and regulatory factors are also important); and target books of business (in annuities, life, or pension risk transfer). Defining the approach up front will save costs later. Further, if the deal is large and part of a platform strategy, the investment could change the DNA of the firm, shifting the focus from PE to private credit, while also posing future regulatory hurdles.

Those firms that are thinking of a platform play, and a long-lasting and growing source of permanent capital, will need three capabilities: proprietary access to potential deals, value-creation skills to make the most of the deals they close, and strong risk-management capabilities given the nature of insurance.

The most common path for new entrants is to acquire or reinsure a closed block. As competition increases, some GPs are exploring alternatives, such as scaling organically or through a series of smaller transactions. However, these approaches are proving challenging given the need to reach scale to attain attractive economics. A third approach seen in two recent examples is a partnership model. New entrants could consider partnering with insurers in addition to making outright acquisitions. If the two parties share in the upside (and the risks) and share the capabilities (for

example, the insurer brings some of the technical capabilities while the GP supplies investment skills), PE firms might be able to secure the benefits of permanent capital while avoiding the complexity of operating a life insurer.

There are a few risks that PE firms should be aware of and take action to mitigate, starting with the asset side of the balance sheet, including illiquidity and credit risk. Rotating the portfolio into higher-risk credit assets has advantages but also creates risk that is important to manage, particularly as the portfolio has typically been invested in more liquid, stable assets. Managing the credit risk of the underlying assets, maintaining sufficient liquidity as needed for policyholders, and managing the market-to-market volatility on the credit portfolio during a credit downturn to maintain regulatory and rating stability are all critical. This risk has been latent, given the relatively benign credit environment in the past decade, but a future emergence could put stress on balance sheets.

A second concern is regulatory uncertainty. Although regulators are getting used to the idea of PE ownership of life carriers,³ approval can take time. As PE firms enter a highly regulated industry for the first time (and encounter all the risks of shifting regulation), they will need skills to engage well with the regulator (and ratings agencies, critical stakeholders in reinsurance), to build their trust, and, ultimately, to persuade them that the firm is a responsible owner.

Public opinion can be another obstacle. In two recent Western European deals, concerns about the impact of a PE owner meant that late-stage negotiations did not succeed.⁴ Finally, firms should consider limited partners' (LPs) reactions to a life acquisition. The potential for sponsor-owned insurers to invest in other assets and funds raised by the same sponsor may change the GP/LP dynamic. Such governance challenges are subtle and may only emerge over time.

Current owners: The value-creation playbook

Once they've acquired a book, firms can turn their attention to driving value. Building on our guidelines for closed-book value creation, owners have six levers that can collectively improve ROE by up to four to seven percentage points (exhibit):

- *Investment performance*: optimization of the SAA and delivery of alpha within the SAA
- *Capital efficiency*: optimization of balance-sheet exposures—for example, active management of duration gaps
- *Operations/IT improvement*: reduction of operational costs through simplification and modernization
- *Technical excellence*: improvement of profitability through price adjustments, such as reduced surplus sharing
- *Commercial uplift*: cross-selling and upselling higher-margin products
- *Franchise growth*: acquiring new blocks or new distribution channels

Most PE firms view the first lever, investment performance, as the main way to create value for the insurer, as well as for themselves. This lever will grow in importance if yields and spreads continue to decline. Leading firms typically have deep skills in core investment-management areas, such as strategic asset allocation, asset/liability management, risk management, and reporting, as well as access to leading investment teams that have delivered alpha.

Capital efficiency is also well-trod ground, and for private insurers it presents a greater opportunity given their different treatment under generally accepted accounting principles, enabling them to

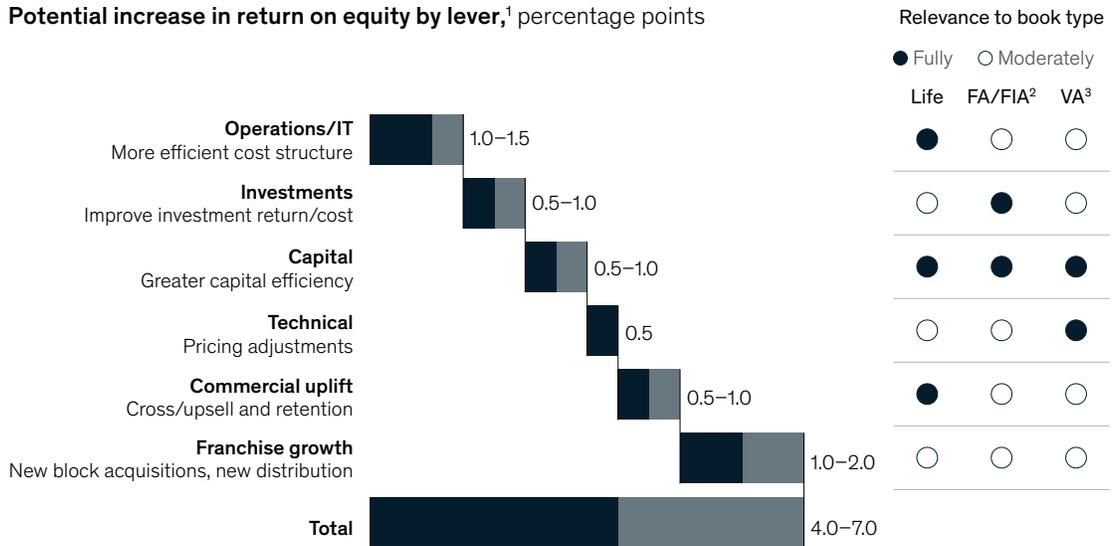
³ Allison Bell, "Federal crash spotters eye life insurers' reach for yield," ThinkAdvisor, December 20, 2021; "Turning up the magnification: Regulators have PE-controlled insurers under the microscope (again)," *National Law Review*, December 9, 2021.

⁴ Pamela Barbaglia and Carolyn Cohn, "Aviva sets Feb deadlines for \$6.6 billion disposals in France, Poland -sources," Reuters, January 26, 2021; Kevin Peachey, "LV= leaders criticised over openness in Bain Capital deal," BBC, November 24, 2021.

Exhibit

The value-creation playbook can lift return on equity by four to seven percentage points.

Potential increase in return on equity by lever,¹ percentage points



¹If carrier matches best-in-class benchmark.
²Fixed annuity/fixed indexed annuity.
³Variable annuity.

apply a longer-term lens and reduce the cost of hedging. However, most firms have yet to explore the other levers—operations and IT improvement, technical excellence, commercial uplift, and franchise growth—at scale. Across all these levers, advanced analytics can enable innovative, value-creating approaches.

Operations/IT improvement

Cost cutting is a paradox for private acquirers of insurance books. On one hand, the opportunity is tempting: insurers have generally not cut costs as fast as other industries, and the books in question are often high-cost operations. On the other hand, acquirers sometimes underestimate the complexity that drives these costs, given the complicated nature of multiple legacy systems and nuances across policy vintages—to say nothing of new costs for postmerger integration. New entrants have a particular advantage here, as they can adopt

a digital-first approach to data and technology, unencumbered by legacy-system issues. Our preliminary analysis suggests that as PE firms achieve scale in insurance, typically defined as at least \$10 billion of assets, costs can be wrestled lower. In our study of a small sample of US and European closed-book acquirers, US firms, which have typically reached scale, enjoy costs 20 to 40 percent lower than general life insurers in most major operating-cost categories. But European acquirers are burdened with costs 30 to 60 percent higher, in part due to the more complex books they have acquired.

Many of the techniques to address operating and IT costs are well understood: process streamlining, changes to operating location, and efforts to reduce overhead costs are levers most insurers have pulled to some degree. Many have also attempted to capture scale benefits. To get to the next level,

insurers can take a comprehensive look at these levers to understand their interdependencies. For example, unlocking scale benefits requires action to reduce complexity of the book, by offloading legacy products, say, or decommissioning legacy IT systems. For a GP, this can reduce dividends in the short term but offer an attractive return given the longer-dated nature of these investments.

New AI techniques, including machine learning, can also help insurers capture more of these opportunities than was previously possible. For example, applying these methods to system migration and data extraction allows insurers to bring down part of the costs before executing an outsourcing contract and therefore retain more value.

Technical excellence

Conducting a thorough review of contractual terms and finding opportunities to adjust where appropriate (for example, through reduced surplus sharing) can be a material driver of value. New AI skills and modernized IT systems can also bolster the ability of insurers to apply technical and commercial levers. For example, AI can enhance an insurer's understanding of customer blocks and enable it to develop a segmented approach with targeted interventions.

Commercial uplift

AI offers additional benefits, such as avoiding lapsing through a better understanding of customers and identifying opportunities to cross-sell or upsell. For example, one insurer applied AI modeling along with a refreshed strategy for sales force optimization. Agents in this program delivered between 40 and 250 percent more cross-sell revenue than a control group that did not use analytics.

Franchise growth

Identifying attractive new blocks and ensuring an operating model that can successfully scale without raising costs significantly or damaging policyholder service is a critical lever. Advanced analytics can unlock new opportunities here as well: applying machine learning to model policyholder behavior

in a target book, for example, can be 20 to 50 percent more accurate than traditional actuarial methodology. Combining actuarial and AI techniques can unlock significant value as the franchise grows. For new entrants, identifying innovative ways to grow the franchise can be particularly attractive. They might, for example, expand into structured settlements, flow reinsurance, or coinsurance (particularly for those without manufacturing capabilities). There are at least three prominent examples of players that began with a closed-book focus but now derive significant value from organic growth which represents 25 to 50 percent of their flows and assets.

Insurers: Fight or flight?

Several leading insurers already exercise the same value-creation playbook that PE firms are using. In many cases, these insurers are better positioned on the operational, technical, and commercial levers. For example, by running operations and IT transformations or using analytics-powered methods to release capital or improve in-force earnings, they are creating value despite the challenging interest-rate environment.

Insurers are also taking a fresh look at investment levers and, in some cases, studying the moves made by GPs for potential insights. Many insurers are building investment skills, reviewing the strategic-asset allocation, and finding new ways to secure access to, and generate alpha from, higher-yielding, capital-efficient asset classes, provided they can effectively manage the risk. In more challenging asset classes, some insurers are exploring partnership models. For example, at least two insurers have recently partnered with alternative managers; in these deals, the insurer brings operations expertise, and the alternative manager can capture the upside from managing the credit investments and delivering best-in-class capabilities for investment performance. The arrangement lets the insurer capture a share of the upside without having to build or buy all of the needed specialist capabilities, and can create a structure with which to raise external capital.

For insurers who cannot see a path to building leading capabilities or have more attractive investment opportunities, sale or reinsurance of part or all of a capital-intensive book could free up significant capital. To gain the best price, they must understand the PE value-creation playbook sketched above and strike a fair deal.

The window is firmly open on this once-in-a-generation opportunity—momentum is building, and more investment is sure to come. But as competition increases and credit spreads remain low, firms will need to evolve their value-creation playbook and deploy a broader set of levers to capture the full potential from this opportunity.

One final possibility for insurers facing a challenging value-creation path: a few insurers could pool their challenged assets and build sufficient scale to offer a compelling proposition to another insurer, either as a purchase or a joint venture.

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The authors wish to thank Pierre-Ignace Bernard, Jay Gelb, Nils Jean-Mairet, Bryce Klemperer, Pankaj Kumar, Ju-Hon Kwek, Nick Milinkovich, Rob Palter, Alex Panas, David Quigley, Andrew Reich, Archie Sinclair, John Spivey, Kurt Strovink, Josue Ulate Chinchilla, and Ulrike Vogelgesang for their contributions to this article.

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Digitally native brands: Born digital, but ready to take on the world

By applying the right criteria, investors can identify digitally native brands with the potential to outperform.

by Adam Broitman, Elizabeth Hunter, and Jennifer Schmidt



Digitally native brands (DNBs) are attracting significant investor attention these days—and for good reason. DNBs make up an increasing share of disruptive players in the market, comprising 15 percent of the new unicorns funded in 2020, up from 10 percent in 2019 and 5 percent in 2018.¹ They are growing, on average, at triple the rate of overall e-commerce,² while the fastest-growing among them have scaled from \$50 million in revenues to \$1 billion in four to eight years.³ The most successful consumer-facing brands, including food-delivery apps, tech-enabled exercise equipment, and hair-coloring systems, are innovative category disruptors that enjoy intense customer loyalty.

DNBs' online origins give them two important competitive advantages: deep knowledge of their customer base and extensive control over the customer file. Whether a DNB is a product, service, or a product-service combination, what sets them apart is the fact that brand owners know exactly who their customers are, what online behavior led them to their initial contact with the brand, and what they're likely to buy next. This insight creates opportunities to build deep and lasting relationships with customers. It's an advantage that can carry over even if, later in their life cycle, DNBs branch into brick-and-mortar.

Today, low barriers to entry have encouraged an explosion of DNBs, flooding the market with the fruits of creative entrepreneurship. However, DNBs that break through with outsize investor returns are rare. Over the past two decades, fewer than 0.5 percent of DNBs have reached \$100 million in revenues. In fact, more than 90 percent of businesses that originated through e-commerce earn less than \$1 million in annual revenues (Exhibit 1).⁴ Investors face the challenge of sifting through concepts to determine which are worthy of the capital required to scale a business or buy into an existing company at high multiples.

There are ways for investors to gauge whether DNBs are equipped for growth and future profitability, which are primarily grounded in understanding how

attractive their customer file is and how much it will cost to acquire new customers. There are four critical factors to consider when assessing whether a DNB has the potential for outsize performance:

1. six key metrics
2. categories with the most potential
3. essential capabilities
4. pitfalls that can derail success

By applying the criteria outlined in each of these sections to the research and diligence underlying a potential deal, investors have the best shot at the golden ring of DNB investing: identifying a brand that was born digital but ultimately lives in the imagination of the world's consumers.

Four critical factors to consider when assessing a DNB investment

Step one in finding a DNB with “superstar” potential requires developing a baseline understanding of the core health of the customer file: how well a business retains and drives spend in its customer cohorts, how much it costs to acquire new cohorts, and how much potential there is to improve in both areas. These bedrock principles of DNB investing are relatively straightforward. Then comes the hard part: assessing how well these pieces fit together and, crucially, how well they underpin a brand with a genuine *raison d'être* in the DNB landscape.

Six key metrics

A brand's investment attractiveness rests largely on a handful of key metrics, which include net customer growth, year-over-year customer cohort value, projected lifetime value (LTV), customer acquisition cost (CAC), contribution margin, and total addressable market (TAM). (For definitions of terms useful to DNB investors, see sidebar, “A glossary of terms for DNB investors.”)

Ultimately, there are a few ratios investors can look at based on these metrics that have strong predictive

¹ McKinsey analysis of data from CB Insights.

² *ComCap evolution of digital brands report*, ComCap, Q1 2020.

³ Tom Huddleston Jr., “How Peloton exercise bikes became a \$4 billion fitness start-up with a cult following,” CNBC, February 12, 2019.

⁴ Revenue Distribution for eCommerce Companies in the Top 10 Countries Database, PipeCandy, accessed October 14, 2021.

value for future success. One of the most common is the LTV:CAC ratio. This measure is essentially the marginal return on investment for acquiring every new customer. Cross-industry averages dictate a 3:1 LTV:CAC ratio as satisfactory⁵; however, the optimal ratio depends on the category dynamics and business model, with early-stage players focused on customer recruitment tolerating levels as low as 1:1.⁶

Another important metric to understand is the overall size of the TAM to the size of the current business. This figure indicates how much runway the business has with its existing offering within the target customer base. Before expanding the TAM into new categories, geographies, and customer groups, a good ratio that indicates further runway is below 5 to 10 percent, though the degree of competition and the size of the market can make the ideal ratio lower.

In addition, for any business that is still unprofitable, tracking how losses change with revenue scaling

can indicate whether it is gaining any operating leverage over time, in particular ensuring that the loss ratio is gradually shrinking.

Categories with the most potential

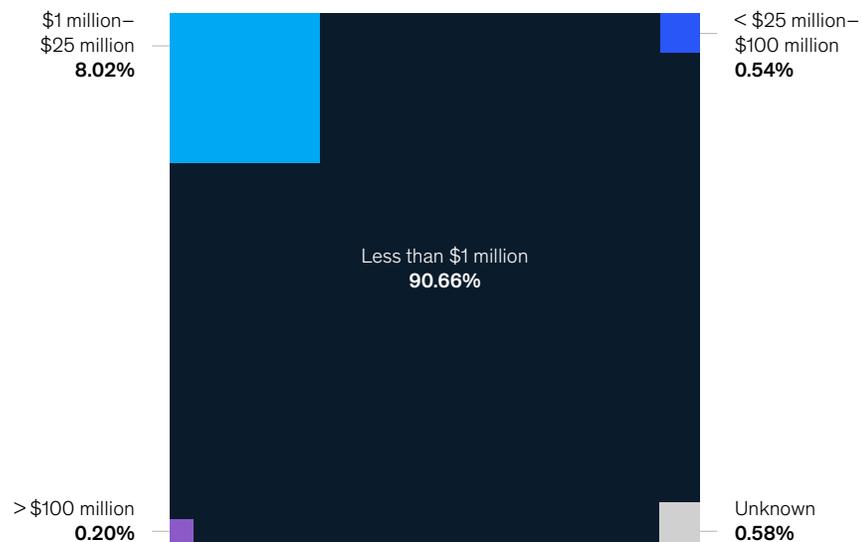
The original generation of DNBs, which began emerging in the 2000s and early 2010s with brands such as Warby Parker and Everlane, often focused on cutting out the middleman to proffer goods at reduced prices or on selling a unique product, or both.

Today, to stand out in the marketplace, DNBs must offer even more compelling propositions to differentiate themselves from traditional brick-and-mortar players or e-commerce offerings. The most successful brands typically play in categories with distinct dynamics, such as predictable and routine consumption patterns, personal and gift-buying tendencies, strong gross margin profiles, favorable size/weight ratio for shipping, and low likelihood of returns (Exhibit 2).

Exhibit 1

More than 90 percent of e-commerce companies in the United States have revenues of less than \$1 million per year.

US e-commerce companies' market share, by revenue band, %



Source: Revenue Distribution for eCommerce Companies in the Top 10 Countries Database, PipeCandy

⁵ "What is the LTV/CAC ratio?," Corporate Finance Institute, accessed October 14, 2021.

⁶ *The Startup Finance Blog*, "What does your LTV/CAC ratio tell you?," Lighter Capital, accessed September 15, 2021.

A glossary of terms for DNB investors

Click-through rate (CTR): a ratio that represents the percentage of people who click on an ad or product listing displayed to them

Conversion-rate optimization (CRO): actions taken to increase the percentage of users who perform a desired action on a given website (for example, making a purchase)

Cost per acquisition (CPA): total cost of acquiring a new customer through a specific action or channel

Cross-channel campaign management (CCCM): technology and tools associated with designing, executing, and measuring

campaigns across multiple channels (for example, online, offline)

Earned media: publicity or visibility gained through efforts other than paid advertising

Net customer growth: the number of customers added by the company in a given period, minus the number of customers who churned over the same period

Next-best offer (NBO): predictive analytics that help support marketers in identifying the right offer (such as promotions, services, information) to put in front of a given customer to get them to purchase

Next-best product (NBP): predictive analytics that help support marketers in identifying the right merchandise to offer a given customer to get them to purchase

Projected lifetime value (LTV): the total contribution margin a company expects to earn over the lifetime of its relationship with a single customer

Share of voice (SOV): share of advertising compared with competitors

Year-over-year customer cohort value: the number of overall sales from a given customer cohort (for example, 2017 customers or 2018 customers) as time goes on

Some of the magic of DNBs is their ability to quickly shift direction and fine-tune assortment, product variety, pricing, shipping, deals, product combinations, and marketing messages to retain and grow their customer base. Successful DNBs monitor tiny shifts in consumer browsing and purchasing behaviors (for example, trial and switch propensity, length of the purchase cycle, responsiveness to new offers) to be able to constantly refine their value proposition to optimize demand and minimize churn.

Over time, it is essential to move from start-up to grown-up and find sufficient scale to leverage core infrastructure and build on an active customer base. The path we typically see begins with expanding beyond the current assortment (for example, add-on items, adjacent categories, or products geared to new customer segments), which expands customers' share of wallet while also attracting potential new consumers. The next step is making a move to new geographies (often guided by early signs of cross-border purchasing),

and ultimately entering brick-and-mortar to gain greater access to cheaper traffic (Exhibit 3).

A good example of a DNB following this playbook is Peloton, which has pulled nearly all the aforementioned growth levers on its path to \$4 billion in revenues in the 2021 fiscal year.⁷ It began by growing across different distribution channels (for example, brick-and-mortar shops) and categories (such as treadmills and accessories), and then pursued new customer segments (for example, app-only customers) and new geographies (such as Canada and the United Kingdom).⁸

These actions can expand the TAM for a given brand, allowing them to tap into new pools of customers, spending, or both. Successful brands approach expansion strategically, using a test-and-learn approach to experiment with opportunities (such as digital pop-up stores or new products offered on a limited basis) before committing to full-scale implementation.

⁷ Peloton Interactive Inc., US Securities and Exchange Commission Form 10-K 2021. New York, NY: Peloton Interactive Inc., 2021.

⁸ *CNBC Disrupter 50*, "Peloton launches an app that's available to anyone—regardless whether they buy a bike or treadmill," blog entry by Angelica LaVito, June 20, 2018.

Exhibit 2

The most attractive digitally native brands typically play in categories with distinct dynamics.

Category indicators of attractiveness, favorability ranking

		LOW FAVORABILITY	HIGH FAVORABILITY
Drivers of consumer demand	1 Consumer need state	Doesn't align with clear consumer need or can be fulfilled by Amazon or B&M ¹	Digitally native brand fulfills a need state that can't be fulfilled by Amazon or B&M ²
	2 Predictable consumption	Low predictability of consumption (eg, mood-based or occasion-based)	Very predictable consumption patterns
	3 Brand relevance	Lack of brand relevance to drive consumer loyalty and purchasing behavior	Effective branding can significantly influence consumer-purchasing behavior
Drivers of economic success	4 Price or cube ratio	Low average unit retail (AUR) or high shipping cost	High AUR and or low shipping cost
	5 Shelf stability or perishability	Low tolerance for pile-up or fulfillment issues	Shelf stability enables room for less stringent fulfillment timelines and pile-up
	6 Complexity of personalization	Low rewards or high complexity of personalization	Personalization delights the consumer and lends itself to high willingness to pay

¹Brick-and-mortar.

²For example, convenience, access, curation, regular replenishment cadence.

Essential capabilities

Successful DNB teams rely on four key capabilities: they build great relationships with customers; they offer these customers compelling reasons to shop with them; they pursue avenues to reduce customer acquisition costs and, ultimately, the payback period; and they use the best and latest technology to drive loyalty. DNBs are often better positioned than traditional brands to do this because of their origins and infrastructure; those that embrace more of these best practices will have the best chance of outperformance.

- **Community engagement:** The most successful players aim for a relationship with consumers that goes well beyond traditional brand loyalty. Instead, they cultivate satisfied customers as influencers who foster brand trust and community participation, driving engagement online through both company-driven and user-generated content.

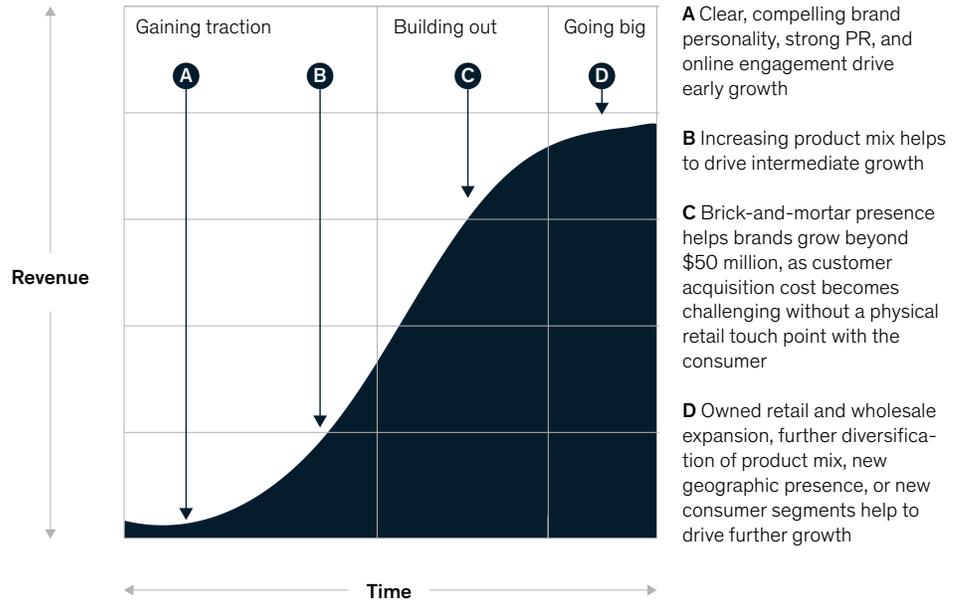
Brands pursuing a high level of engagement must provide excellent customer service, including rapid resolution of issues (both directly reported and encountered through “social-media listening”), loyalty programs, and bonus content. For example, Gymshark built a large, engaged, self-reinforcing community online and offline through grassroots marketing and experimentation across new channels, from Spotify to Instagram, and adapted its approach with the rise of newer platforms, such as TikTok.⁹

- **Performance marketing:** To manage CAC and LTV effectively, high-aspiration DNBs test and learn to determine optimal channels for acquiring customers. They develop analytics that enable them to predict and prevent churn (for example, flagging and reengaging dormant customers). They use targeted and personalized ads, promotions, and referrals to increase awareness, traffic, and conversion.

⁹Marketing Breakdowns, “How Gymshark bulked up to being a \$1+ billion brand,” blog entry by Nikolett Lorincz, September 2, 2021.

Brands over time must move from start-up to grown-up and find sufficient scale to leverage core infrastructure and an active customer base.

Growth milestones for digitally native brands



Strong conversion-rate-optimization capability is another hallmark of a thriving DNB. Successful performance marketers take a surgical approach to optimizing click-through rate, cost per acquisition, paid media (for example, paid search, paid social media, display advertising, and video advertising), and earned media (such as organic search results).

- **Predictive analytics:** Winning DNBs capitalize on opportunities to grow their current customer base by leveraging the deeper data that they can collect relative to their brick-and-mortar peers. Using this data, DNBs can personalize recommendations and offer bundled products and services that delight their customers. Based on extensive testing, DNBs can provide incentives (such as free samples, shipping, and returns) that increase spending.

DNBs often begin their operations in a lean, “scrappy” manner, employing low-cost marketing technology stacks that can easily be modified to promote experimentation and adapted to changing customer or business needs. To do so, DNBs often rely on open-source

technology solutions for managing site content. Content-management systems and flexible cross-channel campaign-management platforms automate and personalize customer communication as well as content and product offers across the customer journey.

More sophisticated brands may leverage predictive analytics to learn how customers use their websites. This insight helps DNBs identify the most promising “next-best product” or “next-best offer” to offer a specific customer, either to recommend products for their next purchase or replacements if they are not able to buy the exact item for which they were originally searching. This level of customization requires DNBs to create a unified view of each customer, often using a customer data platform or similar technology solution.

Pitfalls that can derail success

Investors should be mindful of both conceptual and operational risks that can limit growth and profitability.

- **Constrained total addressable market:** DNBs that are positioned in narrow niches may face challenges growing beyond early-stage levels. Investors must look at whether the business segment is large enough or expected to grow rapidly enough to make scaling feasible, or else be willing to bet that the company can expand successfully into new market segments.
- **Undifferentiated value proposition and innovation:** DNBs that don't offer customers a compelling reason to take a risk on a novel, online-only product will struggle to gain traction. No matter how well-made the product, if it could just as easily be sold at the corner store, it is unlikely to become a game-changing DNB.

Brands stand out from the pack by delivering products and personality that turn customers into staunch and vocal loyalists.¹⁰ This requires a fresh point of view that customers don't see in staid brands. For example, Madison Reed turned hair-color buying on its head, so to speak, by offering custom color kits that arrive on a recurring basis; consumers can request free online color consultations designed to imitate sitting in a salon chair. Brands that offer highly novel solutions sometimes need to overinvest in generating an initial trial so that customers get used to the idea.

- **Poor unit economics:** Few DNBs turn a profit for their first three to five years, and many fail to turn a profit even after a decade of growth. Over the past 20 years, fewer than 0.5 percent of DNBs have reached the \$100 million revenue level. Even some large, publicly traded DNBs reinvest all earnings into additional marketing and capacity expansion and fail to turn a profit. While DNBs don't need to be profitable to be an attractive investment, investors must be wary of DNBs that don't provide evidence of

a path to profitability and the potential to improve margins as they scale. To this end, strong DNBs work to optimize the value chain by increasing their buying power, economies of scale, and operational efficiencies.

- **Lack of focus:** If DNBs expand their services or products to capture a wide customer base before first understanding how to win the core, they risk building an unsustainable customer model with trial but low loyalty.

To be sure, investors must beware the "halo effect," whereby a prospect appears golden because it checks off a series of boxes. While the factors outlined in this article are indeed associated with successful DNB performers, finding a winner is more complex than simply verifying that these steps are followed. The most compelling DNBs started online not because of an advantageous customer file or a wide customer base but because the product or service itself genuinely belonged there and, by existing online, solved problems for customers. Investors should remember that this core authenticity must be in place for the specific approaches outlined in this article to contribute to success.

DNBs represent some of the most intriguing consumer concepts on the market and provide ample opportunity for investors that succeed in identifying winners. There is significant risk, however, of getting stuck funding companies that can't overcome obstacles to growth. Investors can approach DNBs wisely, however, by using the ideas presented in this article to help identify high-potential concepts. The reward: participating in a brand born of the virtual world that grows up to make a mark on the real world.

¹⁰ Claire Martin, "A rare path: From venture capital to hair-coloring kits," *New York Times*, April 22, 2017.

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The authors wish to thank Julie Bashkin and Gabriela Hoffmann Pitten for their contributions to this article.

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Climate risk and the opportunity for real estate

Real-estate leaders should revalue assets, decarbonize, and create new business opportunities. Here's how.

by Brodie Boland, Cindy Levy, Rob Palter, and Daniel Stephens



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Climate change, previously a relatively peripheral concern for many real-estate players, has moved to the top of the agenda. Recently, investors made net-zero commitments, regulators developed reporting standards, governments passed laws targeting emissions, employees demanded action, and tenants demanded more sustainable buildings. At the same time, the accelerating physical consequences of a changing climate are becoming more pronounced as communities face storms, floods, fires, extreme heat, and other risks.

These changes have brought a sense of urgency to the critical role of real-estate leaders in the climate transition, the period until 2050 during which the world will feel both the physical effects of climate change and the economic, social, and regulatory changes necessary to decarbonize. The climate transition not only creates new responsibilities for real-estate players to both revalue and future-proof their portfolios but also brings opportunities to create fresh sources of value.

The combination of this economic transition and the physical risks of climate change has created a significant risk of mispricing real estate across markets and asset classes. For example, a major North American bank conducted analysis that found dozens of assets in its real-estate portfolio that would likely be exposed to significant devaluations within the next ten years due to factors including increased rates of flooding and job losses due to the climate transition. Additionally, a study of a diversified equity portfolio found that, absent mitigating actions, climate risks could reduce annual returns toward the end of the decade by as much as 40 percent.

Leading real-estate players will figure out which of their assets are mispriced and in what direction and use this insight to inform their investment, asset management, and disposition choices. They will also decarbonize their assets, attracting the trillions of dollars of capital that has been committed to net zero and the thousands of

tenants that have made similar commitments. They will then create new revenue sources related to the climate transition.

Building climate intelligence is central to value creation and strategic differentiation in the real-estate industry. But the reverse is also true: real estate is central to global climate change mitigation efforts. Real estate drives approximately 39 percent of total global emissions. Approximately 11 percent of these emissions are generated by manufacturing materials used in buildings (including steel and cement), while the rest is emitted from buildings themselves and by generating the energy that powers buildings.¹

In addition to the scale of its contribution to total emissions, real estate is critical in global decarbonization efforts for reasons likely to be compelling for investors, tenants, and governments. Significant reductions in emissions associated with real estate can be achieved with positive economics through technologies that already exist. For example, upgrading to more energy-efficient lighting systems and installing better insulation have positive financial returns. Today, newer technologies also make low-carbon heating and cooling systems, such as heat pumps and energy-efficient air conditioning, more cost competitive in many markets and climates. These cost-effective upgrades can create meaningful change while also derisking assets.

We suggest three actions real-estate players can take to thrive throughout the climate transition:

- Incorporate climate change risks into asset and portfolio valuations. This requires building the analytical capabilities to understand both direct and indirect physical and transition risks.
- Decarbonize real-estate assets and portfolios.
- Create new sources of value and revenue streams for investors, tenants, and communities.

¹ 2019 *global status report for buildings and construction*, International Energy Agency, December 2019.

Fundamental changes brought on by the climate transition will open new dimensions of competitive differentiation and value creation for real-estate players. More important, leaders will make a valuable contribution to the world's ability to meet the global climate challenge.

Incorporate climate change risks into asset and portfolio valuations

Climate change's physical and transition risks touch almost every aspect of a building's operations and value. Physical risks are hazards caused by a changing climate, including both acute events, such as floods, fires, extreme heat, and storms, and chronic conditions, such as steadily rising sea levels and changing average temperatures. Transition risks include changes in the economy, regulation, consumer behavior, technology, and other human responses to climate change.

Physical and transition risks can affect assets, such as buildings, directly or indirectly, by having an impact on the markets with which the assets interact. A carbon-intensive building obviously faces regulatory, tenancy, investor, and other risks; over the long term, so does a building that exists in a carbon-intensive ecosystem. For example, a

building supplied by a carbon-intensive energy grid or a carbon-intensive transportation system is exposed to the transition risks of those systems as well. All these changes add up to substantial valuation impacts for even diversified portfolios—an increasingly pressing concern for real-estate companies (see sidebar, “We do mind the gap”).

Physical risks, both direct and indirect, have an uneven effect on asset performance

Several major real-estate companies have recently conducted climate stress tests on their portfolios and found a significant impact on portfolio value, with potential losses for some debt portfolios doubling over the next several years. Notably, they found significant variation within the portfolios. Some assets, because of their carbon footprint, location, or tenant composition, would benefit from changes brought on by the climate transition, while others would suffer significant drops in value. The challenge for players is to determine which assets will be affected, in what ways, and how to respond. There is also opportunity for investors who can identify mispriced assets.

Direct physical consequences can be conspicuous: the value of homes in Florida exposed to changing climate-related risks are depressed by roughly

We do mind the gap

As we work with real-estate firms, we notice that investment teams increasingly recognize the impact of climate change on asset values. As one leader of valuations at a major real-estate-services firm recently commented to us: “This is the greatest deviation between modeled valuation and actual price that I’ve ever seen, and it’s because of climate.” A chief operating officer of a diversified real-estate investor told us, “We’ve seen underperformance

of a cluster of our assets due to climate-related factors that just weren’t considered in our investment theses.”

The industry at large senses how values are shifting. A recent survey of finance experts and professionals conducted by researchers at New York University found that those who think real-estate asset prices reflect climate risks “not enough” outnumber those who think they reflect

climate risks “too much” by 67 to 1 (in comparison with stock prices, in which the ratio was 20 to 1).¹ The International Renewable Energy Agency has estimated that \$7.5 trillion worth of real estate could be “stranded”; these are assets that will experience major write-downs in value given climate risks and the economic transition, making real estate one of the hardest-hit sectors.²

¹ Johannes Stroebel and Jeffrey Wurgler, “What do you think about climate finance?,” Harvard Law School Forum on Corporate Governance, September 3, 2021.

² Jean Eaglesham and Vipal Monga, “Trillions in assets may be left stranded as companies address climate change,” *Wall Street Journal*, November 20, 2021.

\$5 billion relative to unexposed homes. According to the *Journal of Urban Economics*, after Hurricane Sandy, housing prices were reduced by up to 8 percent in New York's flood zones by 2017, reflecting a greater perception of risk by potential buyers.² In California, there has been a 61 percent annual jump in nonrenewals of insurance (due to higher prices and refused coverage) in areas of moderate-to-very-high fire risk.³

The indirect effects of physical risk on assets can be harder to perceive, causing some real-estate players to underestimate them. For example, in 2020, the McKinsey Global Institute modeled expected changes in flooding due to climate change in Bristol, England. A cluster of major corporate headquarters was not directly affected, but the transportation arteries to and from the area were. The water may never enter the lobby of the building, but neither will the tenants.

The climate transition will affect both individual buildings and entire real-estate markets

The investments required to avoid or derisk the worst physical risks will drive a historic reallocation of capital. This will change the structure of our economy and impact the value of the markets, companies, and companies' locations. These momentous changes require real-estate players to look ahead for regulatory, economic, and social changes that could impact assets.

Among the most direct climate-transition impacts are regulatory requirements to decarbonize buildings, such as New York City's Local Law 97. In June 2019, the Urban Green Council found that retrofitting all 50,000 buildings covered by the law would create retrofit demand of up to \$24.3 billion through 2030.⁴ Standard property valuation models generally do not account for the capital costs required for a building to decarbonize, and

investors and operators are often left with a major capital expense or tax that wasn't considered in the investment memo.

There is also a host of less direct but potentially more significant transition risks that affect whole markets. For example, some carbon-intensive industries are already experiencing rapid declines or fluctuations. In Calgary, for example, the combination of oil price volatility and market-access issues (driven by climate change-related opposition to pipelines) has dramatically depressed revenues from some buildings. Vacancy rates in downtown Calgary reached about 30 percent, a record high, as of January 2021. Investors exposed to the Calgary market have seen their asset values drop precipitously and are left trying to either hold on and hope for a reversal of fortunes or exit the assets and take a significant loss.

Real-estate players should build the capabilities to understand climate-related impacts on asset performance and values

Real-estate owners and investors will need to improve their climate intelligence to understand the potential impact of revenue, operating costs, capital costs, and capitalization rate on assets. This includes developing the analytical capabilities to consistently assess both physical and transition risks. Analyses should encompass both direct effects on assets and indirect effects on the markets, systems, and societies with which assets interact (Exhibit 1).

Portfolio and asset managers can map, quantify, and forecast climate change's asset value impact

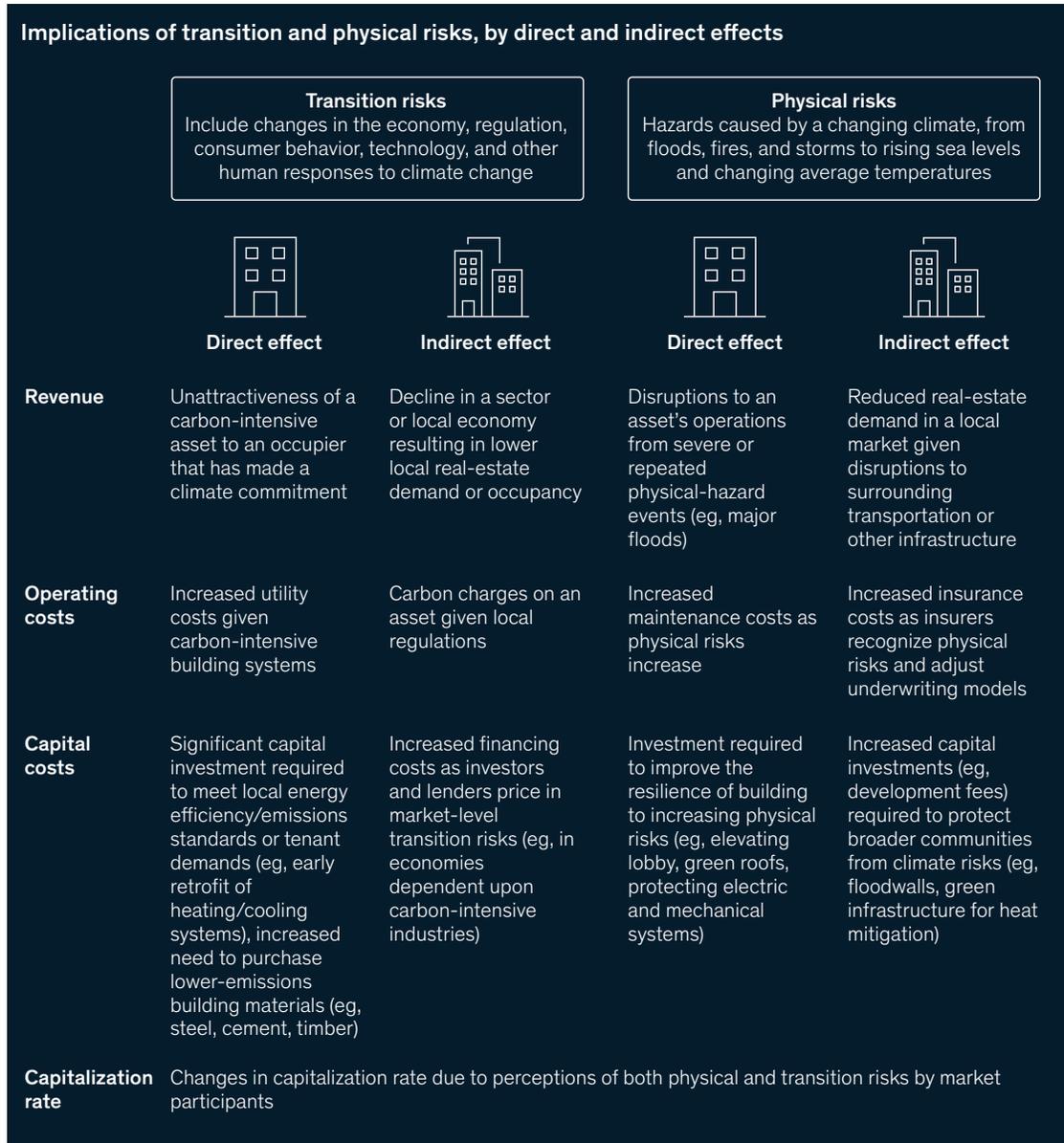
To understand climate change impact on asset values, landlords and investors can develop the following capabilities to understand and quantify risks and opportunities:

²Francesc Ortega and Süleyman Taspınar, "Rising sea levels and sinking property values: Hurricane Sandy and New York's housing market," *Journal of Urban Economics*, July 2018, Volume 106.

³Elaine Chen and Katherine Chiglinsky, "Many Californians being left without homeowners insurance due to wildfire risk," *Insurance Journal*, December 4, 2020.

⁴Justin Gerdes, "After pandemic, New York's buildings face daunting decarbonization mandate," *Greentech Media*, April 23, 2020.

Physical and transition risks have direct and indirect implications for revenue, operating and capital costs, and capitalization rate.



- **Prioritize.** Create a detailed assessment of the asset or portfolio to determine which physical and transition risks are most important and which are less important (using criteria such as the probability of a risk occurring or the severity of that risk).
- **Map building exposures.** Determine which buildings are exposed to risks, either directly (for example, having to pay a carbon tax on building emissions) or indirectly (for example, exposure to reduction in occupancy as tenants' industries decline because of a carbon tax), and the degree

of exposure (for example, how high floodwaters would reach). This could require detailed modeling of physical hazards (for example, projected changes in flood risks as the climate changes) or macro- or microeconomic modeling (for example, projected GDP impacts based on the carbon price impact on a local geography's energy production mix).

- **Quantify portfolio impact.** Combine assessments of the economic risks on individual buildings into an impact map that enables visualization of the entire portfolio (Exhibit 2). This requires combining knowledge of the potential risk or opportunity and an understanding of what drives the economics of a building (including drivers of net operating income, tenancy mix, and areas of cost variability).
- **Take action.** These capabilities cannot be isolated in a research or environmental, social, and governance (ESG) function but should

directly inform investment management, lease pricing, capital attraction and investor relations, asset management, tenant attraction, development, and other core businesses. The processes within organizations must shift to ensure that climate-related insights can be a source of real competitive advantage.

A portfolio revaluation informed by climate change risks can lead to hard choices but will also open the door to acting on decarbonization and exploring new opportunities.

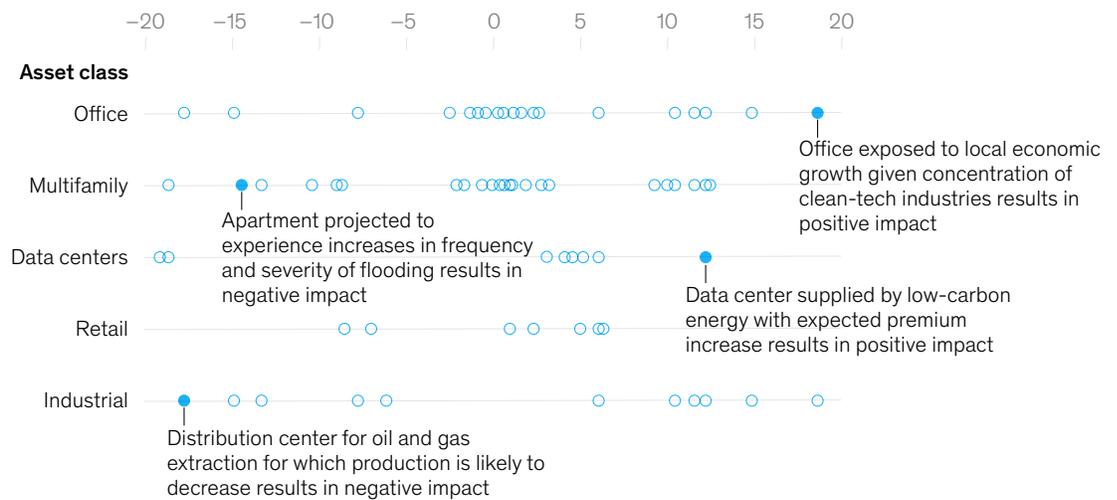
Decarbonize buildings and portfolios

McKinsey research estimates approximately \$9.2 trillion in annual investment will be required globally to support the net-zero transition. If the world successfully decarbonizes, the 2050 economy will look fundamentally different from the current economy. If it doesn't successfully decarbonize, the world will experience mounting

Exhibit 2

Real-estate owners and investors can assess the effects of physical risks and climate transition on the equity value of assets in a diversified real-estate portfolio.

Illustrative chart and examples of physical and transition risk effects on equity value of assets, %



physical risks that will strain the foundations of the global economy and society. In either case, the places where people live, work, shop, and play will fundamentally change.

Decarbonizing real estate requires considering a building's ecosystem

Ultimately, the only way to reduce the risks of climate change is to decarbonize. Real-estate players have a wide array of options for how to proceed, including low-carbon development and construction; building retrofits to improve energy efficiency; upgrades to heating, cooling, and lighting technology; and technology to manage demand and consumption. But decarbonization is not solely a technical challenge. To develop the most appropriate path, real-estate players need to understand the range of decarbonization options and their financial and strategic costs and benefits.

Decarbonizing real estate

To decarbonize, industry players can take the following steps:

- **Understand the starting point.** Quantify baseline emissions of each building. This helps real-estate players prioritize where to start (for example, individual buildings, asset classes, or regions) and determine how far there is to go to reach zero emissions.
- **Set targets.** Decide which type of decarbonization target to set. There is a range of potential target-setting standards that take different approaches (for example, measuring absolute emissions versus emissions intensity, or setting targets at the sector level versus asset level). Players should develop a “house view” on targets that achieve business, investor, stakeholder, regulatory, and other objectives.
- **Identify decarbonization levers.** Build an asset- or portfolio-level abatement curve. A marginal abatement cost curve provides a clear view of the potential cost/return on investment of a given emissions-reduction lever along with the impact of that lever on emissions reduction.

This approach can be complemented with market and policy scenarios that change the relative costs and benefits of each potential abatement lever.

- **Execute.** Set up the mechanisms to effectively deploy the decarbonization plan. These may involve making changes to financing and governance, stakeholder engagement (investors, joint-venture partners, operators, and tenants), and a range of operational and risk-management aspects of the business.
- **Track and improve.** As investors, lenders, and tenants make their own decarbonization commitments, they will need to demonstrate that their real estate is indeed decarbonizing. Thus, much of the value of decarbonizing will come from the ability to demonstrate emissions reduction to potential stakeholders. Building the ability to monitor and progressively reduce emissions on the path to net zero will create an opportunity for players to differentiate.

Create new sources of value and revenue streams for investors, tenants, and communities

As the economy decarbonizes, real-estate players can use their locations, connections to utility systems, local operational footprints, and climate intelligence to create new revenue streams, improve asset values, or launch entirely new businesses.

Opportunities include the following:

- **Local energy generation and storage.** Real-estate firms can use their physical presence to generate and store energy. For example, property developers have been outfitting buildings with solar arrays and batteries, helping to stabilize energy grids and reduce the costs associated with clean energy.⁵
- **Green buildings to attract more tenants.** Developers and property managers can invest in developing green buildings or retrofitting

older buildings to make them green to meet the growing appetite for sustainable workplaces and homes.

- **Green-building materials.** Players can explore the advantages of green steel, tall timber, modular construction, and other emerging technologies and materials that may have additional benefits, such as faster and lower-cost construction.
- **Extra services on-site.** Firms can introduce new revenue streams, including vehicle charging, green-facilities management, and other on-site services that enable occupants' sustainable preferences.
- **Services for reducing and tracking emissions.** Firms can support occupants by tracking emissions and offering solutions to reduce carbon footprints. These services could include smart sensors and tracking energy consumption through heating, cooling, lighting, and space management.
- **Differentiated capital attraction.** Given the volume of capital that has already been

committed to achieving net zero, firms that are able to decarbonize will have an advantage in attracting capital. Real-estate players may, for example, create specific funds for net-zero buildings or investment themes that support community-scale decarbonization.

The coming climate transition will create seismic shifts in the real-estate industry, changing tenants' and investors' demands, the value of individual assets, and the fundamental approaches to developing and operating real estate. Smart players will get ahead of these changes and build climate intelligence early by understanding the implications for asset values, finding opportunities to decarbonize, and creating opportunity through supporting the transition.

Real estate not only will play a critical role in determining whether the world successfully decarbonizes but also will continue to reinvent the way we live, work, and play through these profound physical and economic changes.

⁵“5 ways clean tech is making commercial RE more energy efficient,” Jones Lang LaSalle, April 20, 2021.

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The authors wish to thank Margaret Ewen, Hans Helbekkmo, Yilin Li, Tilman Melzer, and Aditya Sanghvi for their contributions to this article.

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Innovating to net zero: An executive's guide to climate technology

Advanced technologies are critical to stopping climate change—and the drive to develop and scale them is accelerating. Here are five themes that could attract \$2 trillion of annual investment by 2025.

by Tom Hellstern, Kimberly Henderson, Sean Kane, and Matt Rogers



Illustration by SineLab

New technologies represent a critical part of the world's decarbonization tool kit—and the world does not yet have all the technologies that it would need to solve the net-zero equation by balancing sources and sinks of greenhouse-gas (GHG) emissions. The good news: McKinsey research on Europe's net-zero pathway suggests that climate technologies that are already mature could, if deployed widely, deliver about 60 percent of the emissions abatement that will be needed to stabilize the climate by 2050. The challenge is that further abatement must come from climate technologies that aren't quite ready, including 25 to 30 percent from technologies that are demonstrated but not yet mature and another 10 to 15 percent from those still in R&D.

This need for innovation makes the pace of decarbonization difficult to predict. When, for example, will clean hydrogen cost \$1 per kilogram: in 2025 or 2050? The answer will affect the speed at which industries from aviation to steel can decarbonize. Similarly, unless manufacturers of

utility-scale batteries can make them at low cost, power producers will have to keep running fossil fleets to cope with the intermittency of renewables. Uncertainty about the availability of financing for innovation limits capital formation and slows scale-up. Integrating most climate technologies into existing infrastructure, hardware, software, and operational systems will be complicated, too.

Yet there are reasons to be optimistic. Recent history suggests that researchers and businesses can deliver the necessary advances and cost reductions (see sidebar, "Charting cost reductions for climate technologies"). Over the past decade, the cost of some renewable-energy projects came down by almost 90 percent, as did the costs of electric-vehicle (EV) batteries, LED lighting, and other energy-efficient hardware. Capital is increasingly plentiful, evidenced by the revaluation of cleantech stocks that began in June 2020, and by the growth in investments earmarked for sustainability and environmental,

Charting cost reductions for climate technologies

Absent incentives, climate technologies must compete with high-emissions technologies based on cost, efficiency, performance, and other attributes unrelated to their environmental benefits. Of these, high cost can be a significant barrier to widespread uptake—but not a permanent barrier. If demand for climate technologies is sustained over time, then manufacturers can create production efficiencies that allow them to reduce costs (exhibit).

For example, solar-power generation achieved cost parity with coal power in 2013 and gas power in 2015¹—after more than 30 years of research and investment, during which solar-module costs fell by about 98 percent and about \$270 million worth of panels were deployed. Analysis suggests that the cost reductions occurred in two phases, each of which saw cost declines of about 85 percent in the cost of solar modules. During the first phase, between 1980 and 2000, R&D investments accounted

for the majority of cost reductions, and deployments of solar modules were relatively small (about \$15 billion). Then, from 2000 to 2014, governments offered incentives, via mechanisms such as feed-in tariffs and renewable portfolio standards, that encouraged utilities and other organizations to buy and install solar systems. Roughly \$255 billion of solar modules were sold over this time frame, with economies of scale and "learning by doing" in manufacturing accounting for the majority of cost reductions.²

¹ *Levelized cost of energy, levelized cost of storage, and levelized cost of hydrogen*, Lazard, October 19, 2020.

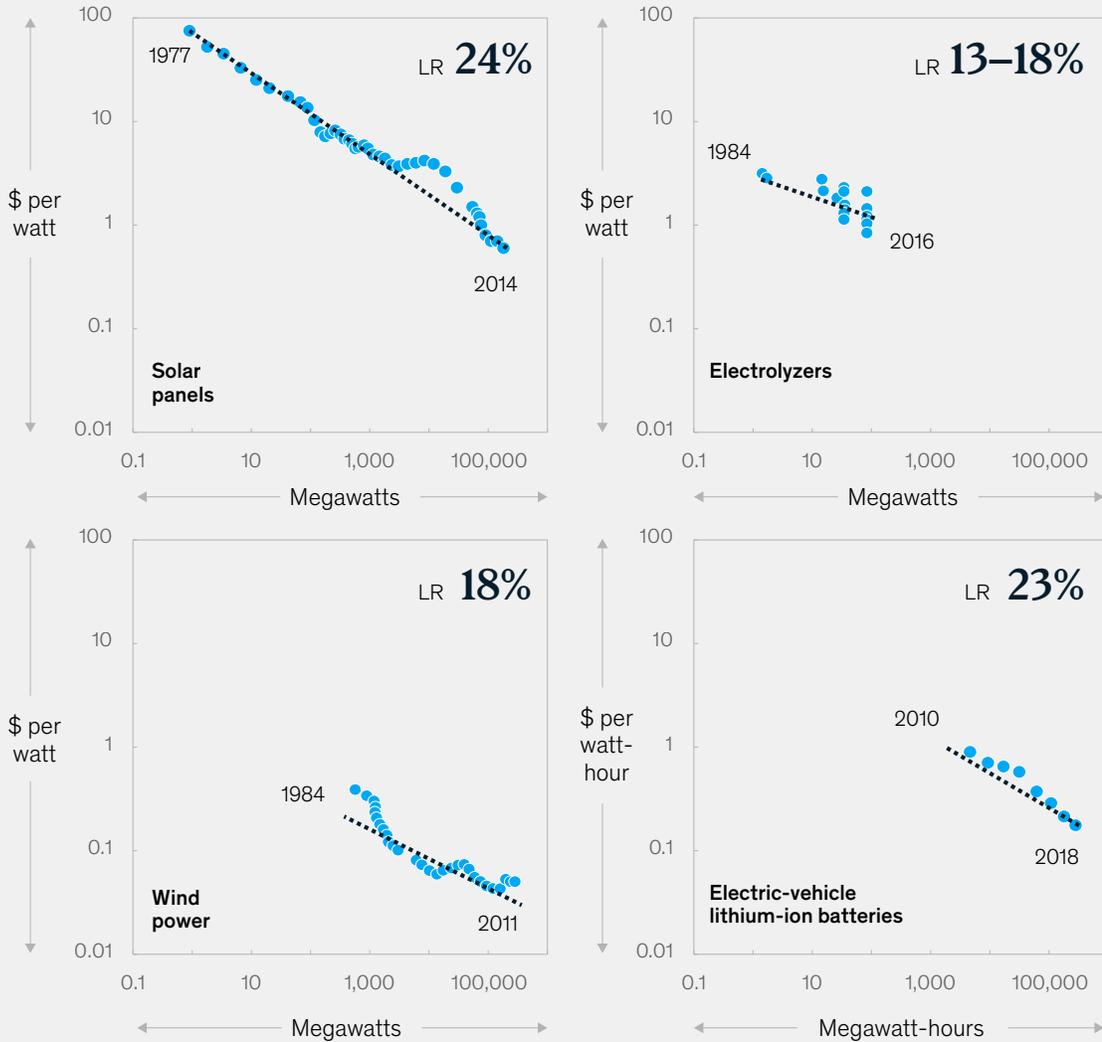
² Goksin Kavlak, James McNerney, and Jessika E. Trancik, "Evaluating the causes of cost reduction in photovoltaic modules," *Energy Policy*, December 2018, Volume 123; Amro M. Elshurafa, Shahad R. Albardi, Simona Bigerna, and Carlo Andrea Bollino, "Estimating the learning curve of solar PV balance-of-system for over 20 countries: Implications and policy recommendations," *Journal of Cleaner Production*, September 20, 2018, Volume 196; Arvydas Lebedys et al., *Renewable energy statistics 2021*, International Renewable Energy Agency, March 2021.

Charting cost reductions for climate technologies (continued)

Exhibit

The unit costs of some renewable-energy technologies have fallen by more than 10 percent a year, as production has scaled up.

Learning rate (LR) for renewable-energy technologies,¹ logarithmic scales



¹The learning rate measures the fractional reduction in cost that occurs with a doubling of cumulative installed capacity. Costs include manufacturing costs only. Source: Avicenne; Benchmark Mineral Intelligence; BloombergNEF; Gunther Glenk et al., "Economics of converting renewable power to hydrogen," *Nature Energy*, 2019, Volume 4; Goksin Kavlak et al., "Evaluating the causes of cost reduction in photovoltaic modules," *Energy Policy*, 2018, Volume 123; International Energy Agency, *World Energy Outlook 2019*; US Energy Administration; McKinsey Center for Future Mobility

social, and corporate governance (ESG) objectives. Governments are lending strong fiscal support to low-carbon innovation. Pledges from big companies not only to cut emissions but also to decarbonize operations and product lines—to buy only renewable fuel or make only EVs—give confidence to entrepreneurs and their backers. Talk of regulatory mandates lends weight to these demand signals.

And, again, the need for climate technology is vast—which creates large potential markets and investment opportunities. Our estimates suggest that next-generation technologies could attract \$1.5 trillion to \$2 trillion of capital investment per year by 2025.¹ To enter these markets and navigate them successfully, established companies, start-ups, and investors will need a nuanced and ever-evolving understanding of technical advances, customer demands and commitments, and policy environments. In this article, we lay out five areas with considerable promise, along with potential obstacles along the path to scale (Exhibit 1):

- electrifying transportation, buildings, and industry
- launching the next green revolution in agriculture
- remaking the power grid to supply clean electricity
- delivering on the promise of hydrogen
- expanding carbon capture, use, and storage

Electrifying transportation, buildings, and industry

Coal, oil, and gas have been the main fuels used to power buildings, industrial machines, and vehicles since the early 20th century. Getting to net-zero emissions will require electrifying most equipment

and processes that now run on hydrocarbons and converting the electric-power system to renewable sources (see next section). Many forms of electric gear, from EV batteries to heat pumps to industrial furnaces, remain expensive. Further innovation will be needed to reduce costs and increase uptake of the electric hardware that will drive a net-zero society.

Better EV batteries. Electrifying transportation requires cutting the cost of batteries, which can account for as much as half the cost of an EV. However, the lithium-ion batteries that are most common in EVs may never fall below the critical threshold of \$100 per kilowatt-hour. To boost energy density and cut costs, battery chemistry will have to improve. Companies are working on anodes with high silicon content, which represent the next frontier. Beyond that, innovations in solid-state, gel, and foam electrolytes would turn ultra-high-capacity lithium metal anodes from a concept into a reality, and one that is safer than today's battery technology.

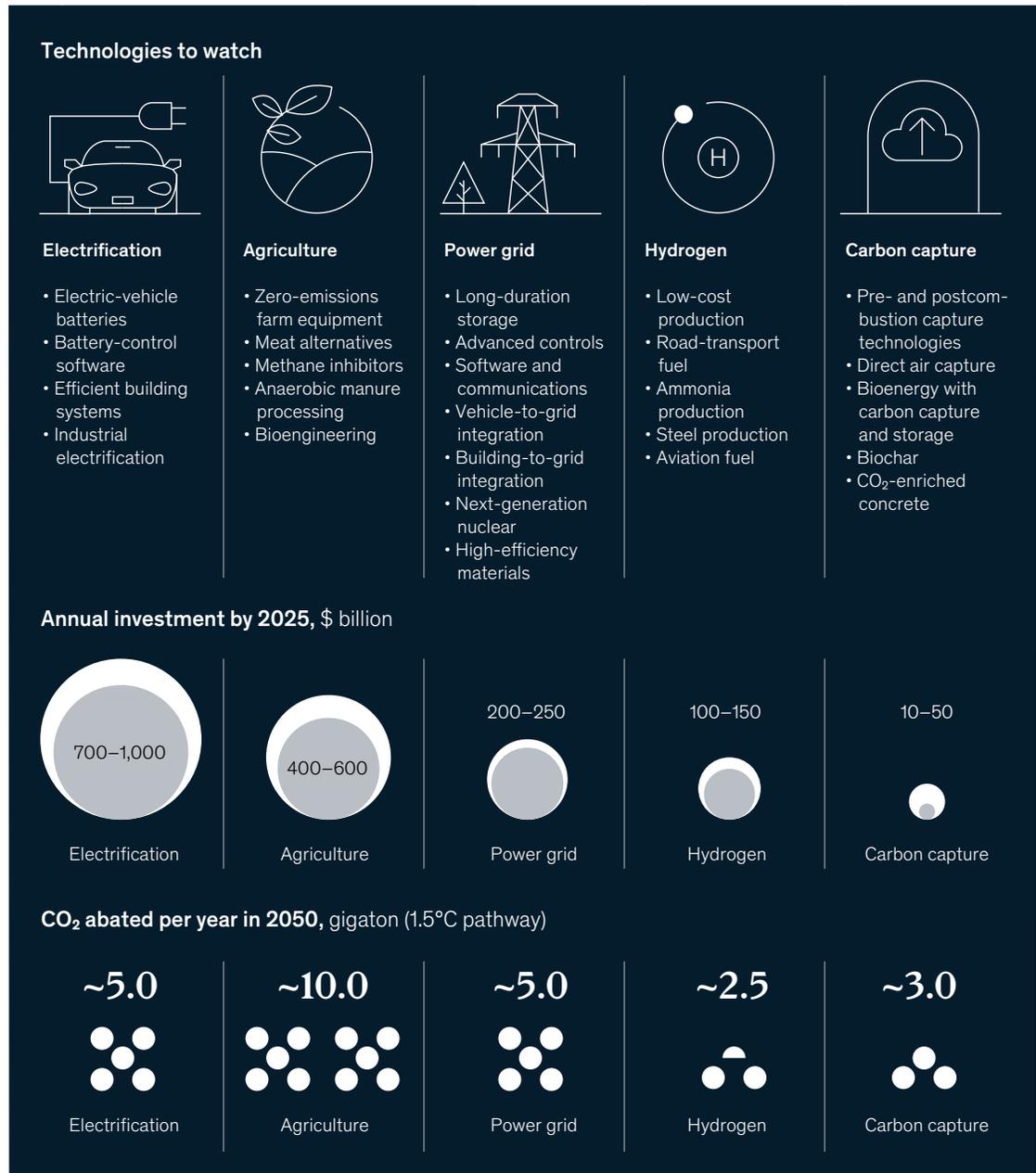
Battery-control software. Hardware improvements aren't the only route to better batteries. Software control systems can also help, and even make up for shortfalls in chemistry. They can shorten charging times: imagine recharging an EV with a 300-mile range in ten minutes or less, instead of one hour at a supercharger or overnight on most home systems. They can prolong battery lives enough to match the life of the vehicle. And they could give EVs added pickup or hauling or towing capacity.

\$700 billion–\$1 trillion investment by 2025

5 GtCO₂e abatement by 2050

¹ The estimates of annual capital investment were developed using McKinsey's suite of decarbonization and energy modeling tools, which include the Global Energy Perspective (*Global energy perspective 2021*, McKinsey, January 2021), Hydrogen Insights, Power Solutions, and our 1.5°C scenario ("Climate math: What a 1.5-degree pathway would take," *McKinsey Quarterly*, April 30, 2020). Estimates of emissions-abatement potential are sized assuming that net-zero emissions are achieved in 2050, based on McKinsey's 1.5°C scenario. These include only the abatement that can be directly or indirectly attributed to climate technologies discussed in this article.

Five groups of technologies could attract \$2 trillion of capital per year by 2025 and abate 40 percent of greenhouse-gas emissions by 2050.



Efficient building systems. Buildings account for about 7 percent of global CO₂ emissions. Cutting those emissions would require making buildings more energy efficient with technologies such as LED lighting, high-efficiency HVAC, and energy controls. But efficiency alone isn't enough. Buildings, like vehicles, have to go electric. Using heat pumps to keep buildings warm, instead of traditional boilers and furnaces, could cut global CO₂ emissions by three gigatons per year if implemented worldwide. Today's models are 2.2 to 4.5 times more efficient than gas furnaces, and recent advances, such as multiple or variable-speed compressors, let heat pumps work in cold conditions that once caused problems. Heat pumps do remain expensive, so cost declines, especially for air-source heat pumps, would likely have to happen before they are used widely.² In addition, energy-reactive windows and those with embedded solar cells could enable buildings to generate all the power they need.

Industrial electrification. As prices of renewable electricity and electric equipment drop, industrial companies could lower costs and emissions by electrifying their operations. The opportunity appears large. Industrial sectors such as cement, chemicals, and steel together consume more energy than other sectors (such as electric power and transportation), and only 20 percent of that energy is electricity. What's more, electrical equipment is less costly and more reliable for many industrial applications, though not all. Electric furnaces, for example, can make heat up to 350°C, but not the high heat of up to 1,000°C that many industrial processes need. Innovation will be needed to address these gaps. There is also the question of how to finance industrial electrification. Replacing long-lived equipment early can mean writing it off, and industrial products tend to have tight profit margins, which can discourage companies from making big capital outlays. New financial mechanisms could help companies cover the up-front cost of electric equipment even with the long payback period.

Launching the next green revolution in agriculture

Agriculture accounts for about 20 percent of global GHG emissions. The most significant GHG from agriculture is methane, which has many times the warming power of CO₂. Reducing methane emissions from agriculture (and other sources) would require major changes to how society farms, eats, manages supplies and waste, and stewards cropland and forests. Many of the changes would be enabled by climate technologies, some of which are relatively mature while others need further development.

\$400 billion–\$600 billion investment by 2025

10 GtCO₂e abatement by 2050

Bringing these technologies to the more than two billion people who work in agriculture will be one of the most difficult tasks on any path to 1.5°C of warming, requiring cost reductions, assistance programs, and infrastructure (such as distributed clean energy). These developments would amount to a new green revolution, one with the potential to surpass the gains that were realized as efficient farming practices were applied widely in the 1960s. These are some of the technologies that could decarbonize agriculture.

Zero-emissions farm equipment. The largest amount of on-farm emissions abatement could be achieved by shifting from traditional fossil-fuel equipment and machinery—such as tractors, harvesters, and dryers—to their zero-emissions counterparts. The economic potential is significant:

² Michael Gartman and Amar Shah, "Heat pumps: A practical solution for cold climates," Rocky Mountain Institute, December 10, 2020.

deployment of zero-emissions equipment could produce cost savings of \$229 per ton of carbon dioxide equivalent (tCO₂e). Nevertheless, uptake of zero-emissions farm equipment and machinery is far behind that of EVs; most varieties are still in the proof-of-concept or prototype phases. Cost reductions and supportive financing would accelerate adoption.

Meat alternatives. Between one-quarter and one-third of global methane emissions are estimated to come from the digestive processes of cattle, sheep, and other ruminant animals. Those emissions will be difficult to abate unless consumers opt to change their diets. But some of the meat and dairy that people now eat could be healthfully, and cost-effectively, replaced with protein from crops such as legumes and pulses. This may require more land and different planting practices but could also reduce deforestation related to the clearing of land for pasture. Lab technology also points toward meat substitutes. Some are plant-based: Beyond Meat and Impossible Foods are two of the leading names in the field. Cultivated meats—those grown in bioreactors from animal cells—are also advancing. McKinsey research suggests that this could become a \$25 billion global industry by 2030.

Methane inhibitors. Companies are developing feed supplements and substitutes that inhibit methane production by altering an animal's digestive processes. Trials have shown that these can reduce methane production by 30 to 50 percent. Propionate precursors—a class of free acids or salts, such as sodium acrylate or sodium fumarate—have been shown to inhibit methane emissions from cattle without affecting animals' growth, and one of these has entered the EU approval process.

Anaerobic manure processing. Manure from cattle and hogs can release significant amounts of methane. Processing manure in anaerobic digesters can cut emissions and also generate biogas, a renewable form of natural gas that can be used on farms, sold to the grid, or fed into production of "gold hydrogen." Such digesters are now used, though not widely, to control odor and pathogens.

But companies are partnering with agriculture and landfill sites to produce biogas for various purposes, such as making compressed natural gas, which counts as a transport fuel under California's low-carbon fuel standard.

Bioengineering. Bioengineering advances agricultural productivity and carbon sequestration and thereby lowers the sector's emissions. Promising technologies include editing of plant genes to promote disease resistance and manage the soil microbiome.

Remaking the power grid to deliver clean electricity

Almost everywhere, power grids are old, inefficient, unreliable—and carbon-intensive. They are nowhere near ready to handle the doubling of electricity demand that could take place by 2050 as electrification happens, let alone prevent a commensurate increase in carbon emissions. Modernizing and decarbonizing the grid involves three main tasks. One is speeding the installation of renewable-generation capacity; to achieve a 1.5°C pathway, we estimate that the global installation rate would need to increase from three gigawatts per week to 15 to 18 gigawatts. Another task is adding energy-storage capacity to manage the intermittency of solar and wind. Last is upgrading the transmission and distribution network to accommodate more front-of-the-meter and behind-the-meter assets.

Few utilities are known as risk takers. For the most part, they are set up—and required by regulators—to deploy proven, mature technologies. These tendencies present limitations. But if innovators

\$200 billion–\$250 billion investment by 2025

5 GtCO₂e abatement by 2050

and grid operators work together (for example, on accelerating the scale-up of long-duration storage) and regulators send helpful signals (for example, by defining mechanisms to reward providers of battery storage and other services that help deal with intermittency), then the following technologies could help create a zero-carbon grid.

Long-duration storage. Even with falling solar and wind costs, as well as cheaper lithium-ion batteries, the intermittency of renewables makes these technologies impractical as the sole source of grid power. A solution is long-duration energy storage, which can store enough power to supply a network for two weeks or more (a typical period of limited renewable generation in many markets). In comparison, lithium-ion batteries can provide backup power cost-effectively for only four hours. At a levelized cost³ of less than \$20 per kilowatt-hour, long-duration storage would make 100 percent renewable systems cost-competitive in US states with ample wind and solar resources. Storage costs of \$150 per kilowatt-hour would allow very high wind and solar penetration, provided that power systems also include strong demand-side management, backup gas turbines, or more integration of regional transmission networks.⁴ Multiple storage technologies are emerging, including power-to-gas, flow batteries, and compressed or liquefied air. Big and small companies are active in this market, and start-ups are pioneering more advanced options such as mechanical systems and modular pumped hydro.

Advanced controls. Today, grid utilization tends to average below 50 percent because the grid is built for times of peak demand and its performance worsens in extreme heat or cold. As more renewables and storage systems are deployed at the grid edge, in homes and commercial sites, they will make power grids more complicated to operate. Resilience, flexibility, safety, and efficiency can be improved with technologies such as solid-state transformers, advanced flexible AC controllers that allow more controlled grid flow, and high-voltage DC technologies for data centers.

Software and communications. Traditional electrical grids use idling power plants to maintain grid balance. These so-called spinning reserves are expensive to run but can respond quickly when demand fluctuates. Modern electric grids would rely on ultrafast communications to maintain grid balance by managing every device on the network. Software-defined inertial substitution (to maintain grid balance when there are fewer spinning reserves), advanced “volt-var” management (to maintain proper voltage over long transmission lines or in highly congested urban markets), and network-wide instrumentation for condition monitoring and fault isolation would help utilities spot issues and prevent interruptions. Distributed energy-management software can coordinate all these elements. Digitized grids will require better cybersecurity protection.

Vehicle-to-grid integration. As more drivers switch to EVs, the big batteries in their driveways and garages could be hooked up to the grid to provide energy-storage capacity. One million typical EVs would offer about 75 gigawatts of storage, hundreds of times more than today’s single biggest utility-scale storage facility provides. Residential backup batteries add more. Accomplishing this integration requires technologies such as inverters that connect rooftop solar, wall batteries, EV batteries, and the grid, as well as fast chargers that buffer the grid from demand spikes while keeping EV batteries full.

Building-to-grid integration. As buildings’ energy controls improve, the buildings can be dispatched to the grid—that is, used to supply power—in ways that improve system performance. Buildings with energy storage or cogeneration could feed power onto the grid when called for, producing income for their owners. And if a utility could reduce power demand slightly in a central business district by signaling buildings to turn down lights, it could cope with demand spikes less expensively than by turning on a gas peaker plant.

³ The levelized cost of storage refers to the full cost, per kilowatt-hour, of setting up and running a battery-storage facility.

⁴ Micah S. Ziegler et al., “Storage requirements and costs of shaping renewable energy toward grid decarbonization,” *Joule*, September 18, 2019, Volume 3, Number 9.

Next-generation nuclear. Nuclear energy has an uneven history: from the 1950s' promise of "too cheap to meter" energy to construction-cost overruns in the 1970s to post-Fukushima fears. Now, the push to decarbonize power has lent new appeal to nuclear generation, which is emissions-free. Emerging technologies include the sodium-cooled, molten salt, and helium-cooled reactors known as "GenIV"; small, sealed, modular, factory-built reactors; and fusion energy, an area where new start-ups are pushing costs down and timelines forward to prototype devices in the mid-2020s, ahead of government-backed research programs.

High-efficiency materials. Scientific advances could produce materials for a wide range of clean-energy applications. Solar cells made with perovskites, a special type of crystal, could outperform regular silicon solar cells—and cost less to make. Graphene, a single-atom-thick sheet of carbon, could revolutionize batteries (by enhancing conductivity and storage capacity), solar cells (by offering superior conductivity contacts with lower light blockage), and high-efficiency transmission lines to carry power from remote but productive renewable-generation sites.

Scaling up the use of hydrogen

Hydrogen could play a significant role in decarbonization, as a clean-energy carrier or fuel ingredient with many applications. High-energy density and zero-carbon combustion make hydrogen well suited to address the 30 percent of GHG emissions—across sectors as diverse as aviation and shipping, industry, buildings, and road transport—that would be hard to abate with electricity alone. Hydrogen could ultimately satisfy 15 to 20 percent of energy demand.

After a push in the early 2000s, innovation in hydrogen technologies stalled. Now it has new momentum. The Hydrogen Council identified 131

large-scale hydrogen projects announced between February and July 2021, bringing the total to more than 350. Direct investment in these projects, which would produce 11 million tons of hydrogen annually, is expected to top \$130 billion.⁵

Hydrogen has a long way to go to fulfill its potential. An entire infrastructure of pipes and storage facilities would have to be built, at great expense. Europe is responding with a plan, the EU Hydrogen Backbone,⁶ to link low-cost supply centers with European demand centers. Other technologies integral to the hydrogen economy include the following.

Low-cost production. If hydrogen could be made for less than \$2 per kilogram in the European Union or \$1 per kilogram in parts of the United States by 2030, major end uses would become economically viable. One production process is the electrolysis of water, whereby electricity is used to split water molecules into hydrogen and oxygen atoms. If electrolyzers run on renewable electricity, the resulting "green hydrogen" is carbon-free. (By comparison, "blue" hydrogen, made from natural gas, is carbon-intensive.) Estimates suggest that electrolyzer costs could fall 60 to 80 percent over the next decade.⁷

Road-transport fuel. Hydrogen's higher energy density makes hydrogen fuel-cell electric vehicles (FCEVs) suitable for long-haul or heavy road transport. For FCEVs to be adopted widely, they would need to become less expensive, and fueling stations would need to be built.

\$100 billion–\$150 billion investment by 2025

2.5 GtCO₂e abatement by 2050

⁵ *Hydrogen insights: Executive summary*, Hydrogen Council, July 2021.

⁶ *European Hydrogen Backbone: How a dedicated hydrogen infrastructure can be created*, Gas for Climate, July 2020.

⁷ *Path to hydrogen competitiveness: A cost perspective*, Hydrogen Council, January 20, 2020; *Green hydrogen cost reduction: Scaling up electrolyzers to meet the 1.5°C climate goal*, International Renewable Energy Agency, 2020.

Ammonia production. This is one of the most promising near-term uses for low-carbon hydrogen. Green ammonia, made with green hydrogen, should be the first variety to match the cost of conventional ammonia production. Hydrogen is also relatively straightforward to integrate in ammonia production, so less supporting infrastructure is required. And ammonia can be used as a fuel or as a “vector” for transporting hydrogen.

Steel production. The steel sector is one of the largest industrial emitters, producing about 7 to 9 percent of global emissions. The conventional blast furnace–basic oxygen furnace route for steel production emits approximately 1.8 tons of carbon per ton of steel. But using green hydrogen to power the direct reduction of iron as a feedstock for electric arc furnaces (which could also be powered by renewables) is one route to zero-carbon steel. Major steel producers in Europe are now piloting steel production with hydrogen.

Aviation fuel. As the travel industry recovers from the COVID-19 pandemic, air travel is expected to produce 3 percent of global carbon emissions. These emissions will be hard to abate until planes are made to fly on fuels other than petroleum-based jet fuel. The best near-term alternative, according to the Clean Skies for Tomorrow Coalition, may be sustainable aviation fuels made from renewable feedstocks such as agricultural biomass. Within the next decade, hydrogen could provide electric power for smaller aircraft equipped with fuel cells. Eventually, hydrogen could be used for combustion in larger planes.

Expanding carbon capture, use, and storage

Carbon capture, use, and storage (CCUS) is necessary to decarbonize hard-to-abate sectors and to remove CO₂ from the atmosphere (resulting in “negative emissions”). Presently, use of CCUS is minimal. Costs remain prohibitively high—typically \$50 to \$100 per ton of CO₂ (tCO₂)—and CCUS equipment consumes a lot of energy. Rollout of CCUS has generally stalled at second- or third-of-a-kind commercial-scale installations at coal or gas power plants, steel plants, and refineries.

Moreover, innovation has been slow. Many existing CCUS plants employ 30-year-old solvent-based technologies for postcombustion carbon capture. But new technologies are emerging. Further R&D would be needed to reduce costs, and additional incentives will likely be required to make CCUS financially viable at commercial scale. But if the full cost of CCUS were to fall below \$50/tCO₂, it would make many applications economical. Here are some CCUS technologies that could help.

\$10 billion–\$50 billion investment by 2025

3 GtCO₂e abatement by 2050

Pre- and postcombustion capture technologies. Precombustion technologies such as oxyfuel combustion represent promising ways to affordably capture CO₂ from point sources since they increase the concentration of CO₂ in flue gases. Development of new postcombustion technologies, such as second-generation solvent formulations, sorbents, and membranes, is helping bring down the cost of capture. Companies, governments, philanthropy, venture-capital, and growth-equity firms have all helped finance improvements in capture technology.

Direct air capture (DAC). Withdrawing CO₂ from ambient air is difficult because air has, at most, one one-hundredth of the CO₂ concentration found in flue gases from industrial point sources. Nevertheless, DAC offers a way of removing CO₂ from the atmosphere—and the world is likely to need many different sources of negative emissions to achieve a 1.5°C pathway. To that end, several companies are investing in DAC, with the goal of achieving capture costs of \$100/tCO₂ to \$150/tCO₂ by 2030, 60 to 80 percent less than today’s pilot projects. Low-cost DAC, coupled with low-cost hydrogen, could enable production of carbon-neutral e-fuels in the near to medium term.

Bioenergy with carbon capture and storage (BECCS). Many fossil-powered plants are nowhere near the end of their useful lives. Taking plants offline before they are due would burden utilities with stranded assets. But the value of these assets could be preserved by converting them to run on biomass, a renewable fuel. Adding CCS equipment to a bioenergy plant lets it produce negative emissions: biomass sequesters CO₂ as it grows, and when that biomass is burned, the CCS system keeps the CO₂ from entering the atmosphere.

Biochar. Biochar is a stable, charcoal-like material made by processing waste biomass such as crop residues through pyrolysis or gasification. Adding biochar to soil can improve soil health and agricultural productivity, opening the door for use in large-scale farming. This practice could sequester nearly 2 gigatons of CO₂ per year by 2050. Adoption rates will depend on the results of commercial-scale experiments over the next decade.

CO₂-enriched concrete. Concrete has two main components: cement, which is the “glue” that holds concrete together; and aggregate, such as sand or crushed stone, which gives concrete most of

its mass. Both have heavy carbon footprints, but companies are working on solutions that would sequester CO₂ in concrete itself. Technologies for adding CO₂ as an ingredient in cement could reduce emissions by up to 70 percent and make cement stronger. Emerging processes might combine captured CO₂ with industrial-waste products such as fly ash, steel slag, and remediated cement to make artificial “rocks” for use in place of natural aggregate.

These climate technologies could contribute to solving the net-zero equation while creating growth potential for sectors and geographies. At present, the technologies exhibit varying levels of maturity, performance, market demand, and regulatory support. To bring them to commercial, climate-stabilizing scale would require companies, financial institutions, and governments to cooperate on investment and research programs as well as efforts to integrate technologies with existing industrial systems. This challenge is formidable, but the moment to devote creativity, capital, and conviction to addressing it is now.

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The authors wish to thank Joshua Katz, Alisha Kuzma, Gregory Santoni, and Bram Smeets for their contributions to this article.

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