

Engineering, Construction and Building Materials Practice

How construction can emerge stronger after coronavirus

Engineering, construction, and building materials have a vital role to play in a post-pandemic recovery of our communities and economies. Seven actions can help companies prepare for the next normal.

This article was written collaboratively by the global leaders of the McKinsey Engineering, Construction and Building Materials Practice, a group that spans different regions and segments and includes: Jonas Biörck, Jose Luis Blanco, Jan Mischke, Maria João Ribeirinho, David Rockhill, Erik Sjödin, and Gernot Strube.



COVID-19 has affected communities globally, with more than 2.5 million reported cases as of April 30—a number that is still rising. And while governments and companies globally are responding fast, much remains to be done.

In this difficult time, construction matters more than ever. From building hospitals in just a few days to donating lifesaving equipment, the industry has played a critical role in responding to the crisis and in the recovery. The industry represents 13 percent of global GDP, and unlocking currently constrained labor availability could help drive recovery while addressing our most pressing construction-related needs.

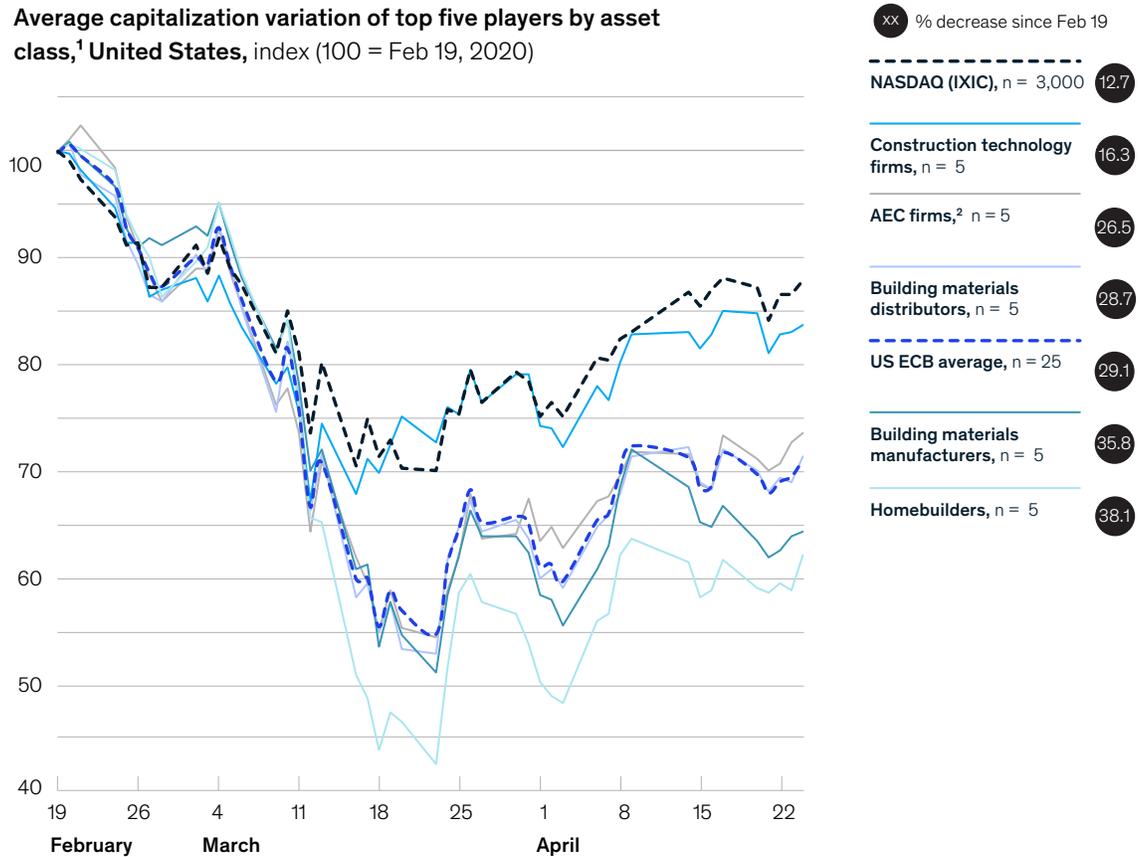
But the industry has also suffered: construction sites in many countries have shut down. And most sites that are open have faced disrupted supply chains and operational restrictions. Such disruption has been reflected in financial indexes: since February, public engineering, construction, and building materials (ECB) companies have dropped significantly more than average (Exhibit 1).

Companies that came out ahead after the financial crisis of 2008 typically moved fast and hard on productivity (including cost reduction), rapidly reallocated resources, and made bold moves (including early divestitures and acquisitions

Exhibit 1

Engineering, construction, and building materials (ECB) companies have experienced larger stock price declines than the reference index.

Average capitalization variation of top five players by asset class,¹ United States, index (100 = Feb 19, 2020)



¹ Subsegmentation includes aggregate daily averages for closing prices for top five companies from each subsegment.

² Architecture, engineering, and construction.

Source: S&P Capital IQ

in recovery) to prepare for the future. Leaders also invested heavily in digital technologies, differentiated their portfolios and offerings, and cleaned up their balance sheets¹ (Exhibit 2).

Yet the COVID-19 crisis is likely to change the dynamics of the ECB industry on an even more fundamental level than the previous financial crisis, highlighting potentially stark divergences between organizations that adapt to and thrive in the next normal—and those that do not.

Organizations must think through the moves they can make today to come out ahead later. A fast return to business as usual seems unlikely for the industry: leaders must first define and prepare for

what the construction industry will look like after the crisis. Seven actions can help them anticipate and adapt to the next normal.

COVID-19's effects on supply, demand, and industry dynamics

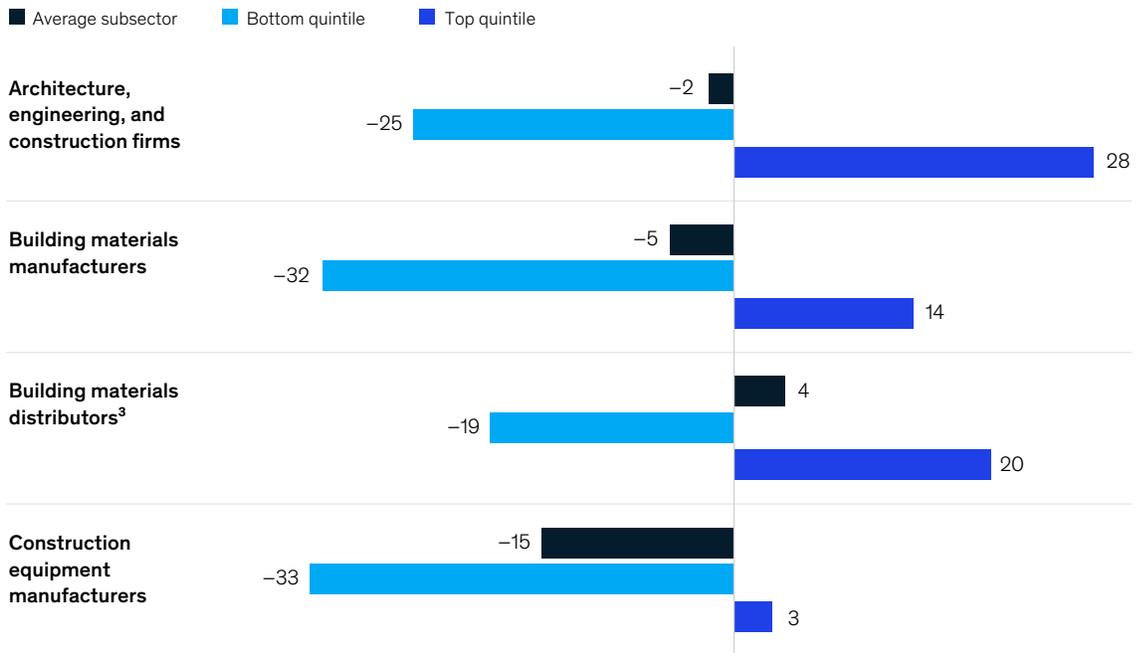
Beyond the short-term impact of an economic downturn on construction demand, the crisis is also expected to hit long-term supply and demand, resulting in lasting shifts in investment patterns. Although a high level of economic uncertainty persists, research from the McKinsey Global Institute suggests that economic activity could be back on track by early 2021—if the virus is contained within the next few months and the right economic policies

¹ Chris Bradley, Martin Hirt, and Sven Smit, "Strategy to beat the odds," *McKinsey Quarterly*, February 2018, McKinsey.com.

Exhibit 2

Similarly to the years following the global financial crisis, players will diverge greatly in their response.

Performance of ECB subsector¹ into and out of the global financial crisis, measured by 2007–11 TSR², %



¹ Includes players with more than \$500 million in revenues in 2018.

² Total shareholder returns.

³ Includes equipment rental companies.

are enacted. However, longer-term lockdowns or other severe restrictions, even intermittent ones, could result in a severe and sustained economic downturn, with economic activity returning to 2019 levels by 2023 at the earliest.²

Construction is typically much more volatile than the overall economy. Reduced economic activity results in less demand for new commercial or industrial facilities, and ambiguity further dampens investment. Loss of income and lack of consumer confidence negatively affect demand for housing construction or refurbishment. And as the value of buildings and infrastructure closely tracks GDP, the need for new construction activity is highly sensitive to GDP growth, even in longer-term models. A four-year slump, for example, could substantially reduce construction's share of GDP above and beyond the initial contraction—even though the current crisis is not primarily related to real estate, as it was in 2008.

On the upside, unprecedented public-relief packages could not only support a rapid recovery but also be followed by public-investment programs.

The pandemic also represents a shock to supply. Both migrant and domestic construction workers may be unable to reach jobsites and will need to adhere to new on-site protocols that will reduce productivity for the foreseeable future. Some building-materials supply chains have also been interrupted, suspending production and distribution.

Signs of disruption

Even before COVID-19, ECB's performance had been subpar compared with other industries. Stagnant productivity, low levels of digitization, and low profitability have dogged the industry for years—as have its highly bespoke building approach, fragmented ecosystem, and high share of on-site manual labor.

Indeed, recent years have signaled impending disruption. A combination of increasingly stringent sustainability requirements, rising cost pressure, labor scarcity, and new available materials, production approaches, and digital tools are forcing

the industry to innovate. For example, the market share of permanent modular construction in North American real estate has grown by 50 percent from 2015 to 2018, albeit from a still-modest basis, and R&D spending among the top 2,500 construction companies has risen globally by approximately 77 percent since 2013.

A forthcoming analysis, which includes an in-depth economic evaluation and a survey of more than 400 ECB executives, also indicates that this disruption will fundamentally shift the size and distribution of industry value pools. Incumbents will need to adapt their strategies and business models to survive and thrive in the ECB industry.

Short- and long-term trends

Preliminary indications are that many of the characteristics of the COVID-19 pandemic are inducing or increasing some disruptions. In addition to immediate trends, we expect longer-term ones to accelerate as new ways of living and working become standard:

- **Short term: Increased digitization.** Organizations across the industry are shifting to remote ways of working. For instance, designers and engineers are relying even more heavily on digital collaboration tools such as building-information modeling (BIM). Leading engineers and contractors are using 4D and 5D simulation to replan projects and reoptimize schedules. Integrated digital-twin solutions are being developed to be used end to end, from project concept to commissioning. And contractors are looking to online channels for monitoring their employees' well-being through apps, ordering construction materials, managing scarce resources more accurately, and maintaining cash flow.
- **Short term: Rebalanced supply chains toward resilience (versus efficiency).** Contractors are building inventory, securing critical materials and long-lead items, and identifying alternative suppliers.

² Sven Smit, Martin Hirt, Kevin Buehler, Susan Lund, Ezra Greenberg, and Arvind Govindarajan, "Safeguarding our lives and our livelihoods: The imperative of our time," March 2020, McKinsey.com.

ECB companies are already taking steps to move beyond the current crisis. Leaders must proactively reshape their agendas to improve their odds of future success.

- **Long term: Augmented consolidation.** Players are looking to consolidate to establish economies of scale and support investment in IT, talent, R&D, and technology. Furthermore, companies and investors will increasingly look to consolidation for much-needed resilience in their balance sheets.
- **Long term: Vertical integration.** Industry players are already starting to vertically integrate to increase efficiency and as a route to standardization and control of design and execution. In a post-crisis world, vertical integration (which may include a return to greater reliance on direct labor) is a potential route to greater resilience. This is the case in industrial asset classes, where equipment manufacturers are experimenting with integrating forward in the value chain and often moving from building to assembling industrial plants. And in real estate, many vertically integrated players are emerging with new business models.
- **Long term: Further investments in technology or digitization and innovation of building systems.** The industry faced a shortage of skilled labor before the crisis. With the prospect of rolling physical-distancing measures and restrictions on cross-border movement of labor, skilled labor shortages will become even more acute. The case for digital tools that are proven to increase productivity, such as 4D simulation, digital workflow management, real-time progress tracking, and advanced schedule optimization, will become even stronger. For similar reasons, we see an increase in R&D spending to develop new standardized building systems to speed up and automate elements of design and construction. We also expect to see more players investing in automation of on-site and back-office processes.
- **Long term: Increase in off-site construction.** Building in controlled environments makes even more sense in a world that requires close management of the movement and interaction of workforces. Such rationale further strengthens the case for off-site construction, beyond the existing quality and speed benefits. In fact, we expect to see contractors gradually push fabrication off-site and manufacturers expand their range of prefabricated subassemblies.
- **Long term: Acceleration toward sustainability, including designs for healthier living.** Governments may stimulate the economy by encouraging measures to meet carbon reduction targets—for example, by retrofitting housing stock to improve energy efficiency. Such incentives might come in the shape of a combination of policy changes and direct public investments. We expect to see a parallel shift in demand toward more sustainable buildings and communities that promote healthier lifestyles (such as access to local amenities and outdoor space, higher standards on air quality, and recycled and sustainable materials).

Reimagining for the next normal

Across all types of business, it is becoming clear that the world will look different as we move beyond the COVID-19 crisis to the next normal. As industry leaders consider navigating this crisis and surviving and thriving in the next normal, we propose a call to action across five stages: resolve, resilience, return, reimagination, and reform (Exhibit 3).³ In particular, reimagination can help ECB leaders look beyond the immediate crisis and start to plan for the next normal.

In the first weeks of the crisis, ECB companies focused on the first two steps: resolving the immediate issues and building resilience for the coming months.⁴ In some regions, sites are now starting to open again, and ECB players are restarting operations (see sidebar, “Considerations for restarting operations in construction: A checklist”). This process demands a delicate balance: protecting the health of workers, demonstrating compliance with local regulations, and managing client and supplier relationships and contracts—all while trying to achieve some level of productivity and financial stability.

The majority of ECB companies are by no means out of danger—and won’t be for some months—but now is the time to start reimagining our industry and how organizations can emerge in the next normal from a position of strength.

Seven actions for success

ECB companies are already taking steps to move beyond the current crisis. Many executive teams are reshaping their strategies and operating procedures, launching ambitious initiatives to come out stronger and spur positive change on the heels of the pandemic. Leaders must proactively reshape their agendas to improve their odds of future success.

The following seven actions can help leaders prepare for the next normal:

- **Accelerate rollout and adoption of digitization.** There is no time to experiment with the perfect road map. Organizations must instead enable well-proven remote use cases. For contractors,

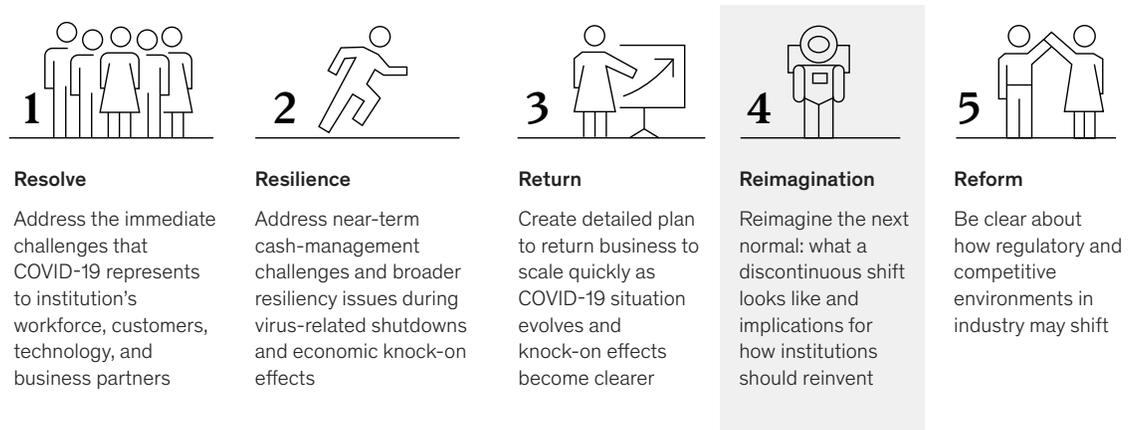
³ Kevin Sneader and Shubham Singhal, “Beyond coronavirus: The path to the next normal,” March 2020, McKinsey.com.

⁴ Mihir Mysore and Ophelia Usher, “Responding to coronavirus: The minimum viable nerve center,” March 2020, McKinsey.com.

Exhibit 3

Engineering, construction, and building materials leaders are now focusing on reimagining the next normal.

The five horizons



Considerations for restarting operations in construction: A checklist

As engineering, construction, and building materials players return to work, they should plan across four dimensions.

Protecting on-site employees

- Establish physical-distancing and isolation policies, based on government and industry guidance
- Maintain physical distance and health (for example, through self-contained crews, changes to shift patterns, temperature checks, self-reporting health checkup apps, reconfigured cafeterias, more personal protective equipment and greater sanitation, and alternative transportation arrangements)

Reorganizing

- Identify work that can easily be taken off-site into controlled environments (such as rebar prefabrication and riser preassembly)

- Establish support and guidance for remote interaction and home office-based work (such as administrative functions and design)

- Reforecast schedules to account for disruption to the workforce and delivery; reallocate resources as needed

Restoring supply chains

- Agree on new ways of working (including procedures for accepting deliveries and payment terms)
- Implement contingency measures for key deliveries (such as third-party logistics providers and alternative distributors)

Reassuring customers

- Make the implications of lower productivity on customers and contracts clear

- Agree on start dates and revised schedules
- Agree on ways of working (such as any contractual disputes that are on hold until sites are back up and running)
- Prepare to renegotiate annual bonus contracts with adjusted end-of-year targets and to adapt the pricing strategy

this may mean scaling up remote collaboration at the production stages using a digital model or urging for minimal manning at site offices. Distributors may need to rethink their entire fulfillment model with minimal physical interactions, especially with e-commerce models for which sales teams could work and handle customer contracts, sales, or ordering remotely with digital tools. Engineering consultants might strengthen their BIM capability and other collaboration tools. Finally, building materials manufacturers may need to ensure updated BIM, market access through e-commerce, as well as effective, digitally enabled remote sales.

- *Invest in the culture and skills needed to operate in the next normal.* Balancing

performance and health is critical at any point in time—and it's that much more important in these turbulent times. Industry players must invest proportionately in culture to erode not only risks related to remote work but also apprehension across the workforce regarding job security and productivity. Moreover, there is no better time to upskill the entire workforce and require training on new tools and technologies (such as BIM) and operating procedures. Many of these activities can benefit employees by encouraging greater engagement among one another.

- *Build a control tower across the portfolio.* In a world in which construction prices may come under pressure, companies should use their

total size to avoid getting squeezed. Resource allocation will pose a significant challenge for construction in the coming months. It will involve making trade-offs between projects and assets and will rely on accurate progress data across the portfolio. Therefore, companies should establish a central monitoring function that can rapidly identify and respond to resource-allocation needs across the portfolio. In addition to systematic assessment of the parts of the portfolio that may be affected by COVID-19, these capabilities can include real-time transparency on project process, material inventory, subcontractors, services, and costs. Players that have increased transparency across portfolios are much better equipped to optimize sourcing, among other needs.

- ***Bolster supply-chain resilience.*** Most ECB players have already reviewed their supply chains for vulnerabilities due to the pandemic; they must now look at options for fortification—such as building inventory, identifying back-up distribution channels, and recruiting direct labor to replace subcontractors. These could lead to greater consolidation and vertical integration of the value chain not only to minimize risk but also drive future productivity. Indeed, today's fragmented and multilevel contracting practices often hinder large-scale changes in ways of working, rollout of digital tools, general investments, and R&D.
- ***Redeploy capital and resources.*** To sustain a post-crisis revival, ECB players must strategize their business priorities. In many cases, responding to COVID-19 could present opportunities to make long-overdue moves. And while aspects will differ across the value chain, they will also likely each contain choices of where to deploy capital, resources, and capabilities (and where not to) in the most economical manner. Examples include

reinforcing future high-growth segments by increasing funding and reallocating competencies or sharpening core business focuses by selectively exiting business areas. Given the breadth of such options, an effective execution should consider both organic and inorganic levers.

- ***Identify opportunities to shift work off-site.*** Suppliers and subcontractors should identify elements and subsystems that can be preassembled in a controlled environment. Longer term, players can look for more significant elements of construction to modularize or build off-site (for example, frames and volumetric modules). Such shifts could help building-materials manufacturers collaborate on designing new product features that could facilitate building-site activities. Furthermore, off-site construction could contribute to sustainability goals by reducing materials waste, noise, and air dust as well as enabling circular building systems.
- ***Get closer to customers.*** Customer preferences are undergoing a step change—toward online retail, remote working, and more sustainable communities, to name just a few examples. It is not yet clear what other shifts might emerge, but we can assume many of those will likely become engrained and normalized in customer preferences, permanently. Therefore, it's more important than ever to stay close to current (and future) customers.

A healthy and productive ECB industry is vital for an immediate crisis response—and to overall economic recovery. However, that industry will look far different from the current setup. Now is the time for ECB companies to prepare for their role in a more productive and resilient industry.

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