A look at countries that have embraced modular construction reveals that two critical conditions—labor dynamics and housing demand—predict adoption, though other factors can also play a big role.
The popularity of modular construction—be it in the form of 2-D panels that require on-site assembly or fully constructed 3-D units built in off-site factories—varies widely in different countries and regions around the world. In some places, such as the United States, adoption remains nascent, while in others, such as Scandinavia and Japan, modular construction has penetrated the market.

Our research has found that seven factors determine the attractiveness of a market for modular construction (Exhibit 1). The leading factors are labor dynamics—specifically construction labor shortages—and continuously high housing demand. After these, determining factors include local site constraints, supply chain and logistics, quality perception, access to materials, and regulations. A brief look at the leaders and the laggards around the globe reveals the conditions that enable modular construction to thrive.

**The role of quality perception in holding back modular construction in the United Kingdom and United States**

Modular construction has had mixed fortunes in the United Kingdom and the United States. After World War II, both countries underwent modular housing booms thanks to rebuilding efforts, the need for social housing, and a desire to make use of empty wartime factories. However, demand evened out in the United States in the 1950s due to the reputation of this type of construction as...
poor quality and unsafe, a perception confirmed by the 1968 collapse of the Ronan Point tower in East London. Its use in the construction of social housing also contributed to a poor societal image, and it fell out of favor as developers pursued more traditional construction methods.

Modular is starting to lose its negative image and is now experiencing a resurgence in popularity. This is thanks, in part, to the opportunities it offers for fast and cost-effective construction, against a backdrop of housing and labor shortages; the United Kingdom alone needs to build 300,000 new homes each year to meet existing levels of demand. Shifts in the offering have also contributed to its resurgence. Modular construction no longer involves simply stacking precast concrete panels into monotonous structures; rather, it allows for more varied offerings featuring high-quality designs and materials.

**Why Japan and Scandinavia embrace modular construction**

While the need for housing and rising labor costs made Japan ripe for the adoption of modular construction, other factors were in play that have contributed to it becoming a mainstream construction method. In addition to developers capitalizing on synergies with the country’s strong manufacturing industries to ensure economies of scale and lower production costs, a counterintuitive environmental factor has helped to drive its popularity: the elevated risk of earthquakes in the region. The enhanced seismic performance of modular homes often results in them selling at a premium compared with homes built using traditional construction methods. Another key enabler is related to regulations; Japan has embraced the use of industry-specific inspectors for modular construction rather than a general building code.

Modular construction is also proving to be a popular construction method in Scandinavian countries. Again, housing demand and high labor costs are two of the drivers behind its adoption, but an additional factor is local site constraints: cold weather and short daylight hours limit the time available on site. As such, modular construction—which replaces time spent on-site with time building under a factory roof—is a logical alternative to traditional construction. A further factor that has spurred the adoption of modular in the Nordics is convenient access to materials. A number of companies operate in rural areas close to timber supplies.

**Increasing modular adoption around the world**

As we look at the intersection again of the two main drivers of modular construction—labor cost and housing need—Australia, Singapore, the Southeast United Kingdom, and parts of the US West Coast appear among the biggest opportunities for growth (Exhibit 2). Today, each of these markets exhibits different levels of penetration, and the success of the transition to modular approaches will depend first and foremost on how competition and industry dynamics play out—but also on how the other five external factors are handled in a given geography. For example, modular construction can compress construction time by up to 50 percent, and lower net construction costs combined with decreased overall life cycle costs can yield up to 20 percent savings. But more complex supply chains and logistics—such as transport regulations limiting the size of modules that can be transported by road—can increase the total cost of a project by 10 percent. Still, if executed properly, the potential benefits are significant, and are expected to become more reliable as the industry progresses.

Favorable regulatory frameworks can play a big role in driving adoption of modular construction. In Singapore, for instance, all public housing must be built using modular techniques, despite the relatively high availability of labor to meet the housing demand. Building standards and financial incentives can also be used to drive adoption of modular construction around the world.
Many countries exhibit conditions appropriate for growth in offsite construction, and some markets are already established.

Near-term demand for new housing vs construction labor supply

Current offsite share of housing, %

1 Construction wage divided by national median wage.
2 2017–20 average housing projection as a % of national housing stock

Source: 5 in 5 Modular Growth Initiative (Ryan Smith); ABS.Stat; CMCH; curbed.com; Euroconstruct; HIA Australia; ILOSTAT; interviews; Ministry of International Trade and Industry (Japan); Mitsui Fudosan; Natural Resources Canada; OECD; Prefab Housing (Matthew Aitchison); Roland Berger; UK Ministry of Housing; Urban Redevelopment Authority; US Census Bureau; McKinsey Capital Projects & Infrastructure
Early adopters of modular construction will likely be the construction leaders of tomorrow, driven by several circumstances. For one, smart building technology will increase the labor demand of construction per unit, and greater design complexity will require modular approaches to secure building quality and congestion. In addition, sustainability restrictions will tighten construction-site regulations regarding duration; transport quantities; or light, noise, and dust emissions. As modular players continue to gain credibility and scale, we expect modular construction to revitalize and help to finally push construction productivity to new heights. To get there, government leaders, developers, investors, and others around the world will need to take stock of the factors that determine the path modular construction takes to scale.

This article is based on a recent McKinsey report, “Modular construction: From projects to products,” June 2019.

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