# WESTPAC ECONOMIC BULLETIN

## Residential building in New Zealand.

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## Simpler, better, faster.

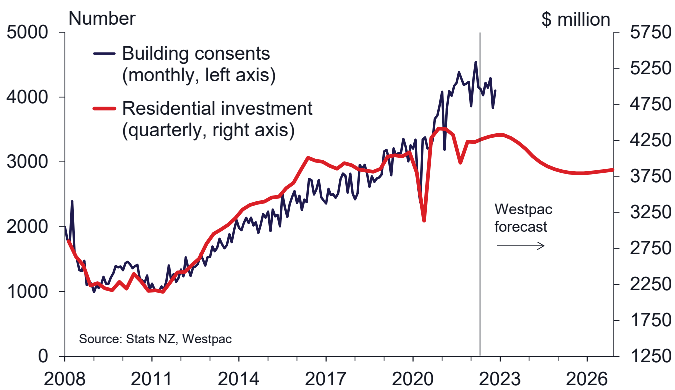
- Residential building activity in New Zealand is expected to slow over the second half of 2023.
- In addition to ensuring their finances are in order, builders should also be positioning themselves for sustainable growth.
- Achieving sustainable growth requires transformational change, which in turn means large-scale investment in new processes and digital technologies.
- However, with builders already enjoying high returns, there is little appetite to make the changes needed.
- There is potential for some building work to be pushed upstream, where ecosystems of manufacturers produce standardised fabricated elements for onsite installation.
- We could also see an increase in imports of larger modular units. Ultimately, we think this is where the sector is headed.
- We envisage a sector with a smaller number of larger, better resourced and more resilient firms. Focusing more on delivering a customer experience, they will increasingly be installers than builders.

### A downturn is coming.

At the moment, New Zealand's residential building sector remains hot, with activity levels and consent issuance currently running at record highs.

That is unlikely to last. Indeed, operating and borrowing costs have already risen sharply, while house prices have tumbled across the country. As prospective buyers of new builds become increasingly nervous and property developers more cautious about bringing new projects to market, forward orders are likely to drop, leading to lower investment and eventually less building activity.

**Figure 1: Dwelling consents and investment in residential buildings**



## What winners get right.

The question then is what should firms in the residential building sector do to navigate through this downturn?

Straight off, it is important to note that irrespective of industry, firms best able to navigate a downturn typically have a leadership and culture that actively plans and allows for constant change. These firms go well beyond just managing for survival and instead take fast, bold, and strategic action to ensure their prosperity.

They are also quick to respond to changes in their operating environment, actively targeting projects that leverage off core strengths to maximise profitability. They have a sharpened focus on cutting costs and paying down debt and ensure ongoing access to credit.

These firms also take a longer-term perspective, setting an intentional course towards value creation, higher performance, and sustainable growth. They know where they want to play, and focus on specific asset classes, sub-market segments, geographies, and/or parts of the value chain.

## Get "financially fit".

In the short-term, getting through the next downturn is firstly about making sure the finances are in order. Industry sources that we talked to described that as "being better at business", "cutting your cloth to suit" or "being lean and mean".

There is nothing new in this. Being profitable, maintaining cashflow and making sure there is enough cash in the kitty is important to all firms irrespective of what industries they operate in.

### Understand costs and revenues.

To be "financially fit", firms must in the first instance have a good understanding of cost and revenue. Builders that know exactly what their outgoings and incomings are and are able to monitor them on an ongoing basis are generally more resilient and better able to handle disruptive events like Covid or an associated economic downturn. Sounds like a no brainer, but it's by no means a given in this sector. By contrast those that don't have access to readily available financial information cannot make the changes necessary to preserve profit margins when the pressure comes on.

Financial skills are critical to ensure resilience.

### Reduce costs and boost revenues.

Preserving margin is critical for builders when work slows. High-performing firms first react by cutting costs. According to various industry sources, that usually means laying off staff. Selling off underutilised equipment, plugging profit leaks that occur because of, for example, estimation errors; and shutting down poorly performing profit centres are also viable options. Builders might also look to reduce costs by pursuing easy and least cost efficiency gains. An industry source, for example, indicated that they reduce costs by using inexpensive mobile tablets to help minimise the time taken for onsite decision making.

Next, high-performing firms move to boost revenues. In an ideal world this means focusing on projects that, at the very least, preserve the gap between revenues and costs. The trend away from fixed to variable price contracts in recent years, where the risk of cost fluctuations is borne by the customer, is an example of that. The same applies to sunset clauses that apply to "off the plan" sale and purchase agreements. Originally created to protect purchasers, these additional clauses have now been extended to allow developers and/or builders to cancel projects, if delays to completion result in them being out of pocket.

High-performing firms focus first on minimising costs, then boosting revenues, to maintain margins during a downturn.

### Diversify operations.

With less work on hand, high-performing firms will often look to protect revenues by pursuing projects less sensitive to the economic cycle, such as renovations that support independent living for older people, government maintenance, and remodelling work. An industry source in Canterbury, for example, indicated that in addition to building houses, they also undertake renovation work for their local council. In a similar vein, builders that face a decline in privately funded building work are more likely to go after projects funded by government agencies like Kāinga Ora. An industry source suggested that with almost $14bn worth of funding available over the next five years, the agency was well-placed to support the sector if, as expected, private demand for building activity wanes in the second part of 2023.

Diversification also means offering complementary services. An industry source that provides construction services to home builders in the South Island, for example, suggested that being able to offer a diverse range of plumbing, drainage and gas services provided enough variation to get them through when demand for building slows.

Irrespective of what form diversification takes, it is critical that building firms only pursue work that leverages off existing strengths. If they do not, they are more likely to find that they cannot deliver to agreed standards, timeframes, and budgetary constraints. In an environment where there is less work, a resulting lack of competitiveness is likely to prove disastrous. In other words, only diversify if it is profitable to do so.

Successful diversification that leverages of existing strengths supports margin preservation.

## Cash is king.

Equally important is ensuring that there is cash running though the business. Builders and property developers rely on cashflow to provide the cash needed to fund new projects, keep those on the go moving, pay for materials, labour, equipment as well as overhead costs even when there is a shortage of work.

Not having enough cash is a key reason why construction firms fail. In part that reflects a key structural vulnerability – many of the 24,000 firms that build houses in New Zealand are small, poorly capitalised operators existing on a project-to-project basis. An industry source suggested that 50% of builders with 5 employees or less face ongoing cashflow difficulties at any point in time.

And it's not just smaller firms that are affected. Project delays and cancellations, late or missed payments from customers, both more likely during a downturn; or a sudden increase in the cost of building materials, as we saw during Covid, can potentially undermine cashflows, eat into cash reserves and threaten the viability of even the largest firms. Between January and May 2022, about a quarter of all company failures in New Zealand were in the construction sector – and that is during a time when activity was at elevated levels. More recent estimates put this figure closer to a third.

Other than setting aside a rainy-day fund, the best way to boost cashflow and preserve cash reserves is to make sure that systems and processes are in place to ensure invoices are paid in full and on a timely basis. This includes outgoings and incomings and is particularly relevant during a downturn when under duress purchasers are much more likely to delay or default on payment. By monitoring cashflow, a company can better predict its needs, flag potential problems, and ultimately help grow the business.

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### It is critical to have adequate cash reserves before and sufficient cashflow during an economic downturn.

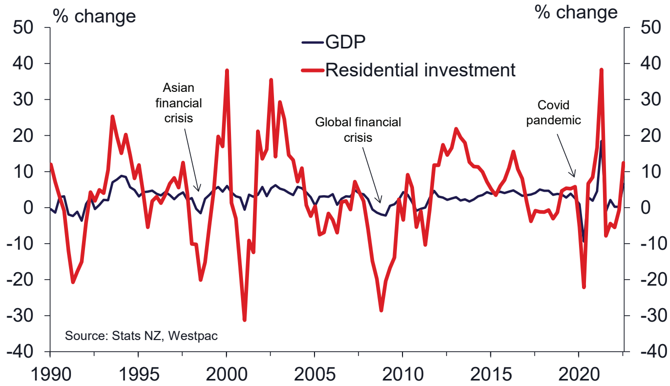
## Get "structurally fit".

Being "financially fit" is something that high-performing firms pursue to get through the next downturn in the investment building cycle.

Indeed, making sure that finances are in good order and diversifying swiftly into more profitable areas should be front of mind for all firms during both good and bad times.

However, the sad reality is that many building firms take their "eye off the ball" when work is plentiful, only to find themselves having to scramble when demand dries up, the investment cycle turns, and the volume of work slows.

**Figure 2: Cyclicality of residential building investment**




And the investment cycle always turns. Indeed, investment in residential building activity is notoriously cyclical, massively overshooting when the economy is on the up and undershooting when things turn sour. Since the early 1990s, there have been five big upturns and four downturns, the latest occurring during the Covid pandemic.

However, as mentioned above, high-performing firms don't just look to make sure they can ride out the investment cycle. Indeed, they look through it. They tend to take a longer-term perspective and proactively make changes to improve their competitiveness and position themselves for sustainable growth. Simply put, in addition to being "financially fit" they focus on being "structurally fit".

## Change is needed.

The need for change is well overdue. Home building is beset by inefficiency, weak productivity growth and waste. Projects in New Zealand often run over budget, are delayed, and/or require rework because of deficient building quality. New Zealand, of course, is not unique in this regard. A study of completed projects in twenty countries showed that over the course of a 70-year period, 85% ran over budget, with an average overrun of 28%.

And perhaps that is not surprising. Building projects are complex, involve multiple steps and numerous participants, each of whom have scattered accountability. They tend to place great emphasis on manual labour and labour-intensive processes. Co-ordination and communication are often difficult, especially in an environment where project relationships are adversarial, and the emphasis is on transferring risk and apportioning blame rather than maximising efficiency. One industry source suggested that building firms were particularly vulnerable to litigation when things go wrong, even years after construction has been completed. For that reason, they tend not to have strong balance sheets and are often "lightly capitalised", so they don't become "targets" for claims from customers later on.

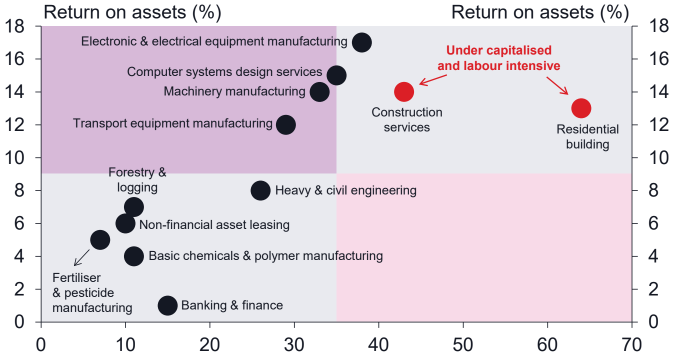
Builder-customer relations are also fraught. For example, poor communication leading to misunderstanding is commonplace in this industry, and can result in unrealistic customer expectations on timeframes, budgets, and finished designs. Addressing these shortcomings requires a conscious effort as well as a set of competencies that are often beyond the reach of smaller firms in particular.

More recently, of course, there have been the additional complexities caused by supply chain disruptions and labour shortages due to Covid. Happily, supply chain issues have eased in recent months, although with over 90% of building materials and products used by builders being indirectly imported from overseas, the sector still remains susceptible. However, the supply of labour remains an ongoing concern for builders. An industry source that provides construction services highlighted high registration requirements and poaching by Australian firms as ongoing labour constraints.

## Fraught relationships and resource shortages undermine the delivery of building projects to agreed standards, timeframes, and budgets.

Addressing these issues is vital to improving competitiveness. By reducing inefficiency, firms are able to lower the cost of delivery, which in turn creates greater leeway for price setting and increased profitability. That is particularly important for firms where the ability to differentiate is limited, i.e. homes are built to similar specifications, standards, and timeframes. It also makes them less vulnerable to the boom-and-bust cycle which characterises this sector.

Figure 3: Comparative return on assets and equity




Source: Stats NZ, Westpac

That at least is the theory. The reality is that many of the factors creating inefficiencies in the industry are endemic to it. In an environment where returns are already high, there is little incentive for firms to address these inefficiencies through meaningful operational change.

## High returns stifle efforts to address inefficiencies that are endemic to the sector.

### A digital evolution is slowly unfolding.

New digital technologies could potentially drive change in the industry. Indeed, digitalisation has the potential to completely transform how houses are built in this country, resulting in better operating efficiencies, less waste, and lower carbon emissions. For participating builders that means lower unit costs of production and a competitive dividend.

But there is a long way to go. Homebuilding in New Zealand is a traditionally low technology sector that lags other industries in terms of technological innovation and adoption. It also lags its international peers.

Where digital technologies are used, this tends to be limited to the earlier phases of the building cycle, such as investigation, planning and design. Even then it is mostly piecemeal. An industry source referred to the use of drones, and how that has sped up the surveying process. Another source referred to the use of 5D Building Information Modelling (5D BIM) to provide more accurate costing during the design phase.

### 5D BIM.

5D BIM is the five-dimensional visualization of any project that consists of budgetary and cost considerations associated with the project.

While 3D deals with a three-dimensional depiction consisting of geometrical and design parameters, 5D BIM allows stakeholders to understand, analyse, discover, and record the impact of changes on the cost of the project.

The propensity to adopt digital technologies is positively correlated to the size and sophistication of the firm. Bigger homebuilders typically have the resources that allow them to embrace new digital technologies. Smaller boutique operators that deliver high-spec houses are also more likely to adopt digital technologies than the traditional builder.

## The adoption of digital technologies by homebuilders in New Zealand is patchy at best.

### Digital revolution is a long way off.

The use of digital technologies to pursue entirely new business models is an even rarer occurrence. Very few firms in New Zealand build houses in digitally enabled factories. Most that manufacture in a factory setting are cut and nail operations. Compare that to overseas. In Sweden for example, more than 80% of homes are being built in factories. In the Netherlands that figure is closer to 20%, while in Japan it's about 15%. Meanwhile in the US, UK, and Australia only 5% of houses are constructed using industrialised processes.

## Building activity in New Zealand mostly takes place onsite.

True industrialisation, which is about applying production/ supply chain processes and concepts long adopted by the manufacturing sector to the building of houses, is completely absent in the New Zealand context. Typically, these processes would be underpinned by the latest technologies, which today would include robotics automation, 3-D printing (additive manufacturing), sensors, artificial intelligence (AI), internet of things (IoT) and big data.

### Offsite construction.

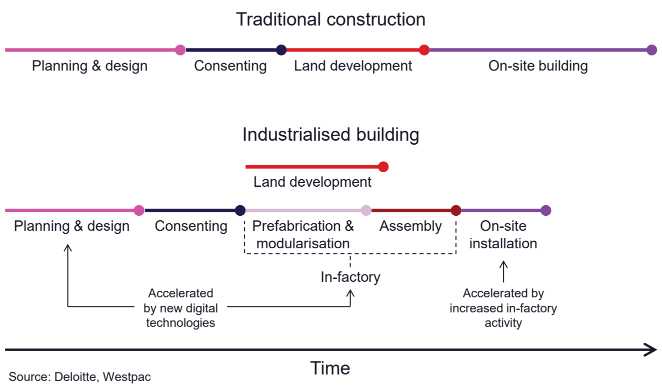
According to a report by Allied Market Research in August 2021, the global offsite construction market generated revenues of US$130.4 bn in 2020 and that is expected to reach US$235.46 bn by 2030.

Source: Allied Market Research

In essence, industrialisation is about "pushing" many of the activities that normally take place on a building site back up the value chain, which itself has been reconfigured. Put slightly differently, it's about vertically unbundling traditional building processes and outsourcing these to specialist firms further up the value chain. Key concepts include the standardisation of building products and components, prefabrication of building components, and modularisation of prefabricated components.

The processes that underpin the industrialisation of home building are similar to those employed for many years by vehicle manufacturers. In that sector, ecosystems of original equipment manufacturers (OEMS) produce and supply componentry of varying levels of sophistication, which vehicle assemblers then use to create a final product, i.e. a vehicle.

Figure 4: Industrialisation of residential building




Source: Deloitte, Westpac

Applied to the building sector, networks of OEMS operating within tiered structures would manufacture prefabricated elements and componentry which would then be used by other OEMs to produce modular units. Home assemblers would then take those modular units to produce completely built houses in-factory before installers and construction service providers, i.e. electricians, plumbers, roofers, install them onsite as per customer specifications. Alternatively, assemblers might operate onsite rather than in a factory.

An important point to note is that under this model, installers are less about the process of building and more about delivering what the customer really wants. Much like vehicle assemblers today, installers would place a heavier emphasis on marketing and in particular, the positioning and development of their brands to differentiate themselves from their competition.

The potential benefits are huge. They range from reducing unit costs of production to improving build quality, less re-work, better on-time delivery, and increased responsiveness to customer requirements. Other potential benefits include improved safety during the building process, reduced carbon emissions and less need for environmental remediation. In short, industrialisation addresses the issues that currently plague the industry.

## Embracing industrialisation.

The question then is why hasn't the local building sector embraced industrialisation?

In essence it's about risk versus return. Simply put, with building firms already achieving high returns, there is little incentive to completely re-engineer existing work organisation methods and supply chain arrangements.

For one thing it would require massive investment at each point in the value chain. Factory buildings are not cheap. Nor are new plant and equipment or the digital technologies that underpin them. Making them all work together seamlessly, within individual firms and across the building ecosystem, is an expensive and risky undertaking.

Add to that the investment needed in human resources. Innovation, digitisation, value-chain control, technology use and specialisation.

This new investment would also have to deliver acceptable returns. According to one industry source that would require operating at a scale not yet seen in New Zealand. The same industry source, which is a large developer and builder of medium density houses across New Zealand, currently completes 3 houses a day.

Achieving economies of scale also requires a big customer base that can provide an ongoing source of demand. But in a market already saturated with builders of all stripes, it is not clear whether New Zealand's relatively small population, which grows at less 2% a year, could actually support that. And that is before considering whether New Zealand has the necessary infrastructure able to facilitate the mass transportation of completed houses from the factory to site.

## The business case for industrialising the building process doesn't add up.

One possibility could be to explore export opportunities, but that really is a non-starter. Not only would component manufacturers and module builders in New Zealand be disadvantaged by the tyranny of distance and associated higher transport costs, but they would also face entrenched competition in export markets, which are often a lot larger than ours.

Indeed, it is far more likely that the opposite could happen, i.e. home assemblers here could import modular units from other countries, such as China, which have been able to invest heavily in digital technologies and have the ability to generate economies of scale. Given that most materials used locally in the house building process already have a high import component, that is not beyond the realms of possibility. There would of course be obstacles to overcome - not least of which would be compliance with relatively high New Zealand standards.

That does not mean that houses in New Zealand cannot be manufactured in a factory. However, that is less about industrialisation and the adoption of digital technologies, and more about moving the location of assembly to a more controlled environment to improve quality. That is particularly relevant for smaller boutique firms that manufacture a small number of bespoke houses each year for more discerning customers that want closer involvement in the build process. There are several firms in New Zealand already operating in this space.

Industrialisation requires scale as well as certainty of demand.

## What this means for the sector.

In the short-term not much is likely to change. Indeed, there is an inevitability of how things are likely to play out over the next couple of years.

Low barriers to entry and exit mean that as the demand for building activity slows over the coming year, a resulting squeeze on finances will push some firms out of the industry, only to return in another form when the investment cycle turns, and conditions improve. Most susceptible will be smaller "financially unfit" firms that have a weak grip on their finances, lack the flexibility to diversity their operations, or are unable to tap into new funding sources, such as that provided by Kāinga Ora. Mid-sized firms are also likely to be vulnerable if they are not able to "cut their cloth" to suit prevailing conditions. Larger, better capitalised firms with stronger order books should be able to ride the storm and emerge on the other side, shaken but not stirred.

Longer term, the residential building sector will see structural change as firms increasingly look to leverage off emerging digital technologies to ensure they are competitive. There will be first mover advantage.

But that will take time. Indeed, the structural rigidities outlined above will ensure that the pace of change remains slow, with the sector falling further behind its offshore peer group.

The change coming is also likely to be evolutionary rather than revolutionary. That means digital technologies will continue to be applied to an ever-wider range of activities across more phases of the building cycle. In the future the use of drones to survey, inspect and monitor building activity will become commonplace. The same applies for autonomous vehicles which will increasingly be used to drill, excavate, and undertake earthworks, especially in hazardous locations. Other possibilities include the adoption of exoskeletons and single task construction robots to lift heavy substructures, install drywalling, paint, and lay bricks.

However, as time progresses, the scope for applying low-cost digital technologies is expected to narrow. That means firms will have to invest ever larger amounts just to remain competitive. For many small operators that will be a bridge too far and they will either go out of business or become easy pickings for larger firms always on the lookout for skills, competencies, and expertise. There will be no coming back for them.

The adoption of these new technologies will mostly focus on making existing processes more efficient. For reasons already given, we do not think new technologies will transform how homes are built in New Zealand. Put slightly differently, full-on industrialisation is not on the cards.

That said, we think there is still a case for pushing some building work back up the value chain. Think of it as "industrialisation lite". While full domestic modularisation is unlikely, there is scope for upstream manufacturing ecosystems comprised of OEMS to deliver more standardised-fabricated elements that can be installed onsite and customised to the customer's requirements. That will make the building site a less congested space.

There is also scope to increase imports of modular units from countries able to leverage off economies of scale and to comply not just with New Zealand's stringent building standards, but also neighbouring Australia's. Indeed, we think that eventually that this is where the sector will end up. That will, however, be decades in the making.

We envisage the sector will look quite different in the future. We expect a smaller number of firms, most of whom are likely to installers rather than builders. Focusing more delivering a customer experience, these installers are likely to be larger, better resourced and more resilient to the boom-and-bust investment cycle that characterises this sector.

That doesn't mean that traditional builders will disappear. However, increasingly we think they will be geared to the niche end of the market, focusing almost entirely on bespoke luxury homes.

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