

STUDY REPORT

SR 326 (2014)

Productivity trends and the implications for our industry

Matthew Curtis

David Norman



The work reported here was funded by BRANZ from the Building Research Levy.

© BRANZ 2014
ISSN: 1179-6197

Preface

This report is in response to the need for up-to-date productivity data. It presents the results of the BRANZ Economic Research project QR0043. It builds on the information found in the BRANZ Study Reports SR310 *Measuring construction industry productivity and performance* and SR317 *Potential measures of productivity and performance at the firm, grouped firm and regional level*. It also uses updates data first presented in the PwC Report *Valuing the role of Construction in the New Zealand economy*.

Measures of productivity is a high priority, low performance topic in the latest Industry Needs Survey. It has therefore been identified as a key priority for new information. The regular monitoring of performance measures is important so stakeholders can keep up-to-date with changes in the industry.

It is also imperative that the industry gains a better understanding of the performance issue. This can only come through up-to-date performance measures. This will allow individual firms to compare what they see in their firm with recent changes in performance measures.

In particular, stakeholders need to understand the implications of the current boom on productivity, where the biggest gains have been, and how productivity gains are split between profits and salaries. They also need to consider what planning is needed for the inevitable end of the boom.

Acknowledgments

This work was funded by the Building Research Levy.

Productivity trends and the implications for our industry

BRANZ Study Report SR 326

MD Curtis and DS Norman

Abstract

Traditional productivity measures such as capital and labour productivity suggest that the construction industry has performed poorly over a long period of time. This is particularly the case when compared to industries such as agriculture and forestry. In recent years, however, the rebound in demand for housing in Auckland, earthquake strengthening, the Canterbury rebuild, leaky buildings remediation, and large infrastructure projects have led to a busier building industry.

At the same time, the Productivity Partnership has set a target of a 20% increase in multi-factor productivity by 2020.

This report illustrates the importance of resilience for the construction industry. The boom-bust nature of the industry makes it necessary for the industry and individual businesses to understand what the implications are and how to prepare for it. This report provides the empirical evidence for understanding how productivity is affected across the business cycle, and identifies areas to focus on to better prepare for the next downturn.

| Contents | Page |
|---|-------------|
| 1. EXECUTIVE SUMMARY | 4 |
| The message to industry | 4 |
| The message to businesses..... | 4 |
| 2. INTRODUCTION..... | 5 |
| 3. LATEST TRENDS IN INDUSTRY PRODUCTIVITY AND DEMOGRAPHICS..... | 6 |
| 3.1 Labour Productivity per worker hour | 6 |
| 3.2 Multi-Factor Productivity: Productivity gains from non-labour inputs..... | 9 |
| 3.3 Changes in jobs filled, businesses, GDP and productivity | 12 |
| 3.4 Business Size and Construction GDP | 14 |
| 3.5 Gross Profit per Employee by Sub-Sector | 16 |
| 3.6 Taxable Profits over Turnover | 17 |
| 4. THE CURRENT UPTURN..... | 18 |
| 4.1 Construction GDP and Comparator Industries..... | 19 |
| 5. THE CANTERBURY REBUILD..... | 20 |
| 5.1 Worker Turnover in Canterbury | 22 |
| 6. ARE WE SEEING THE PRODUCTIVITY GAINS EXPECTED?..... | 24 |
| 6.1 Labour Productivity Growth Following a Bust | 25 |
| 7. ARE THERE SIMILARITIES TO PREVIOUS UPTURN-BOOM CYCLES?..... | 27 |
| 8. WHERE TO FROM HERE?..... | 29 |

| Figures | Page |
|---|-------------|
| Figure 1 Illustration of the construction productivity cycle | 5 |
| Figure 2. Construction industry labour productivity | 7 |
| Figure 3. Labour productivity of comparator industries | 7 |
| Figure 4. Construction industry multi-factor productivity | 10 |
| Figure 5. Multi-factor productivity of comparator industries | 10 |
| Figure 6. Construction jobs filled, GDP and productivity | 12 |
| Figure 7. Construction GDP, employment and businesses | 13 |
| Figure 8. Construction average business size | 14 |
| Figure 9. Share of workers by business size..... | 15 |
| Figure 10. Value added per employee | 16 |
| Figure 11. Taxable profits/turnover | 17 |
| Figure 12. Construction industry GDP..... | 18 |
| Figure 13. Construction industry GDP and comparator industries..... | 19 |
| Figure 14. Construction FTEs and consents growth around New Zealand | 20 |
| Figure 15. Nominal consent values in Canterbury | 21 |
| Figure 16. Worker turnover in Canterbury..... | 22 |
| Figure 17. Worker turnover in construction industry | 23 |
| Figure 18. Productivity and GDP growth | 24 |
| Figure 19. Labour productivity in the year following the end of a bust..... | 25 |
| Figure 20. Labour productivity growth across the upturn-boom..... | 26 |
| Figure 21. Real GDP in the construction industry | 27 |
| Figure 22. GDP and labour productivity during a downturn-bust | 27 |

1. EXECUTIVE SUMMARY

This report is the culmination of the project looking into construction industry productivity. A number of key measures are used to illustrate how productivity changes across the business cycle and how this affects individual businesses.

The key message to take from this report is the need to be more resilient against both downturns and upturns in construction activity. The boom-bust nature of the construction industry has a well-documented impact on the industry, its businesses and workers. This report shows how the industry has responded to recent circumstances including the Canterbury rebuild, but also questions how ready businesses are to scale up quickly in upturns and weather the downturns.

The message to industry

The study shows that the construction industry is more susceptible to economic conditions than its comparator industries. Strong growth in construction industry GDP in 2013 and 2014 due to the Canterbury rebuild and the demand for housing in Auckland have helped the industry outshine comparators.

Changes in jobs filled in the construction industry and construction GDP are closely related. At the beginning of a downturn, businesses hoard workers, and at the start of an upturn they increase output per worker. But in both up- and down-turns, businesses soon respond by shedding or adding workers, meaning labour productivity remains relatively unaffected by the point in the building cycle. The study shows that there is typically a surge in labour productivity at the beginning of the upturn, but these gains taper off as the upturn continues.

This means the industry is failing to take advantage of the opportunities upturns present to improve productivity, and to use the good years to prepare for the bad that will inevitably follow.

The message to businesses

As changes in the consented workload increase at a faster rate than the number of construction employees, employees need to work longer hours and/or more employees will be needed. There is also likely to be an increase in competition as new businesses enter the market and jostle for workers. This will impact individual businesses' ability to hold on to employees and may affect profit margins if workers capture a larger share of value added.

With the high demand for construction workers, particularly in Auckland and Canterbury, the study shows job-hopping to have become a reality. Businesses face pressure to improve compensation packages. This includes the basic wage, plus other benefits such as use of work vehicles. It is also important for businesses in these high demand areas to understand pressures that workers are under due to high workloads.

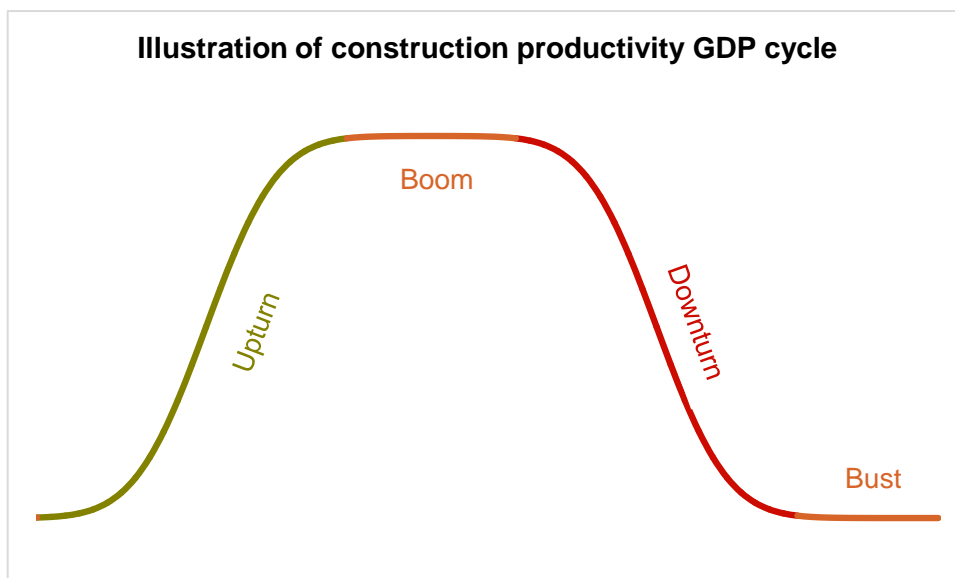
2. INTRODUCTION

This study report focusses on the implications of trends in productivity and industry demographics on industry and business. It updates a wide range of indicators that will help builders (as well as government agencies) think through the implications for their businesses. The explanations of recent changes in productivity measures include what this means for firms and the industry overall, and what businesses may see as a result of these changes.

It is important to remember that measuring productivity will not in and of itself improve industry performance. Therefore, the use of high level productivity data in this report, which will prove useful for government and researchers, is accompanied by a focus on the building firm. The report is presented in easy to read language and answers the “so what” questions for the building industry.

Figure 1 shows the various stages that the construction GDP and productivity cycle goes through. The first section, shown in green, is the upturn. This is the start of a boom and is accompanied by strong productivity growth and growth in workloads. Productivity growth flattens as the workload grows and more workers are taken on during the boom. Next comes the downturn, illustrated in red. This is the period where workloads fall but businesses are loathe to shed workers, leading to lower productivity. Finally, productivity stabilises at a lower level when businesses are forced to reduce headcounts, flattening the curve at the bottom of the cycle.

Figure 1 Illustration of the construction productivity cycle



We use the terms illustrated above to describe what happens in the construction industry at various times.

3. LATEST TRENDS IN INDUSTRY PRODUCTIVITY AND DEMOGRAPHICS

The first section of data in this report focusses on the latest trends in official productivity measures. The measures used are common means for measuring productivity, such as labour productivity, multi-factor productivity and value added per employee.

3.1 Labour Productivity per worker hour

Labour productivity is a measure of the GDP generated by the economy as a whole or any one industry divided by the number of paid hours of work (labour units) in the economy or industry.¹ Therefore, using the construction industry as an example, labour productivity is shown by:

$$= \frac{\text{GDP generated by construction industry}}{\text{Paid hours of work by the construction industry}}$$

Labour productivity can be improved by:

- Increasing the GDP generated by the construction industry with the same number of paid hours worked
- Maintaining the same GDP generated by the construction industry with fewer paid hours worked
- Increasing the GDP generated by the construction industry with fewer paid hours worked
- Increasing the GDP generated by the construction industry by a larger percentage than the number of paid hours worked.

Trends in labour productivity are shown in Figure 2 and Figure 3. Several comparator industries as well as service industries and “all NZ” are included to compare with changes in construction industry labour productivity. Long-term changes since 1978 are shown for context.

Construction industry labour productivity has increased slightly from the year ending March 2011. Overall, labour productivity in the construction industry rose by 24% over the last 34 years to March 2012. This indicates that over the last 34 years, labour productivity growth averaged 0.6% per year.

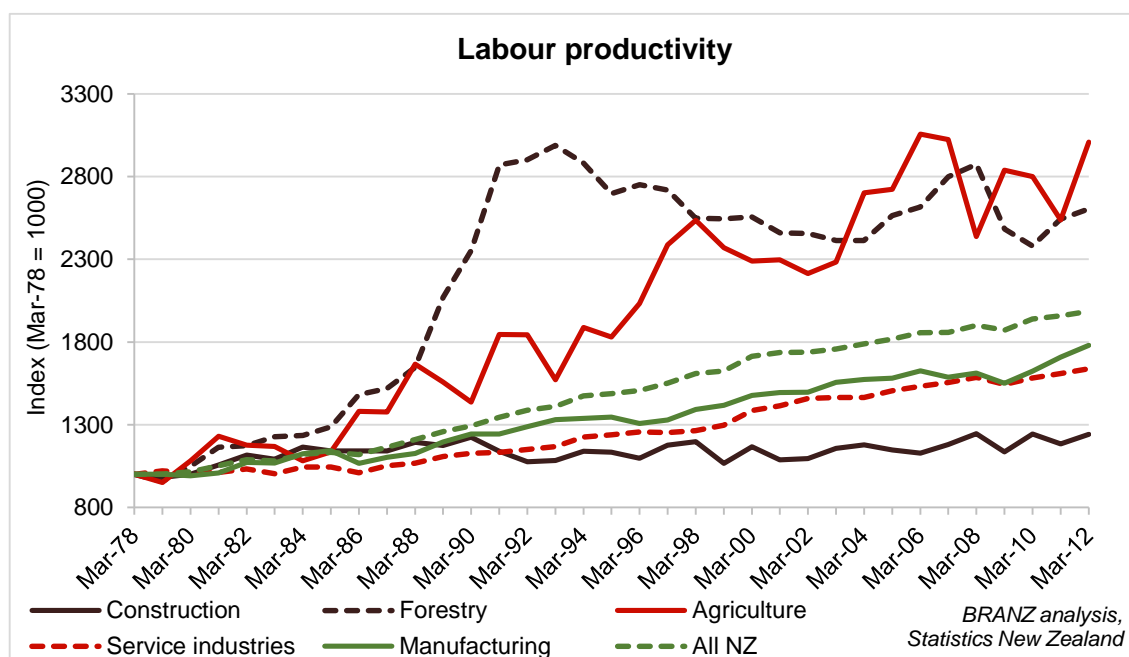
¹ Page, I., Norman, D. (2014). *Measuring construction industry productivity and performance*.

Figure 2. Construction industry labour productivity



Labour productivity growth in the Forestry and Agriculture industries has exceeded anything achieved by any of the comparator industries we have selected.²

Figure 3. Labour productivity of comparator industries



² These are industries that have typically been used because they are all primary or secondary industries. They all typically employ heavy machinery in the production process.

The nature of the construction industry and its susceptibility to the boom-bust cycle is believed by the authors to have made it difficult for the construction industry to improve labour productivity.

The Agriculture industry is a tradable export industry. Therefore, it is subject to world demand (and world prices). Demand for our dairy-products continues to grow. Therefore, prices received for our dairy-products are increasing as well (both domestically and internationally, short-term declines excluded). This is helping the agriculture industry achieve strong labour productivity growth. The construction industry in comparison is non-tradable.

Forestry had strong growth in labour productivity between March 1985 and March 1993. It since has largely declined. The industry experienced rising log prices – so as with the Agriculture industry, much of the labour productivity growth was export-driven.

So how can the construction industry improve labour productivity?

It seems as though many comparator industries have been able to improve labour productivity through price increases driven by international demand. This is not something that the construction industry will be able to move towards to achieve similar growth.

It is often difficult for trades to adequately estimate how long their jobs are going to take. This results in other trades being held up and an inefficient use of time. Therefore, one key way for the construction industry to improve their labour productivity will be through better project management.

Other possible ways for the industry to see improvement in labour productivity would be:

- Improved client knowledge (i.e. a client that more adequately understands what work needs to be done) and minimise rework due to client changes
- Better managed workloads so that the hours that each individual worker is working is as efficient as possible
- Better management of employees so that jobs are distributed to minimise travel times
- Off-site prefabrication.

3.2 Multi-Factor Productivity: Productivity gains from non-labour inputs

Multi-factor productivity measures changes in total productivity not caused by changes in the number of labour and capital units.³ Changes in multi-factor productivity are generally brought about through:

- Long term technology changes – the improvement in technology or the use of technology
- Improved skills – the hiring of workers that are more skilled than current employees
- Management and training – more effective management of projects can lead to greater efficiency on projects. Upskilling current employees should improve the production from each employee
- Economies of scale – there are advantages to be gained through business size, output or scale of operation. This is due to fixed costs (i.e. costs that need to be paid no matter what is produced) being spread over a greater level of production.
- Regulatory changes imposing additional overheads (off-set to some extent by an improvement in quality of output).

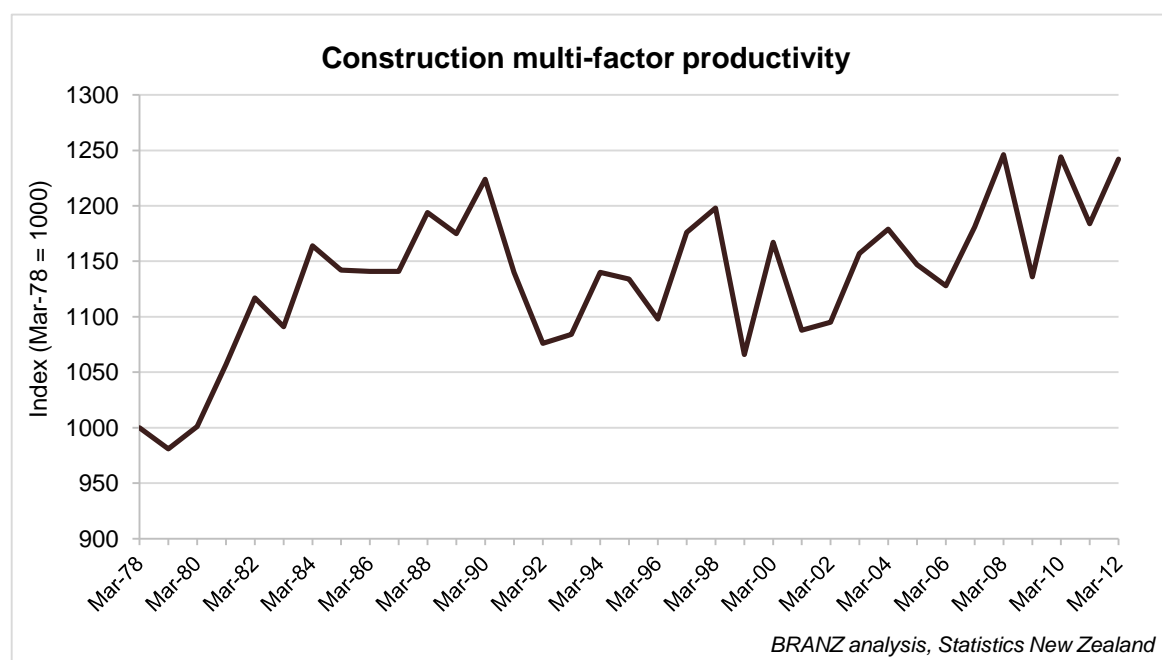
Multi-factor productivity in the construction industry is given by:

$$= \frac{\text{GDP generated by construction industry}}{\text{Capital units} + \text{Labour units}}$$

Multi-factor productivity has remained fairly flat. There has been a slight improvement between the year ending March 2011 and March 2012. There has not been a sustained period of growth. However, there does appear to be a slight upwards trend since the year ending March 2009.

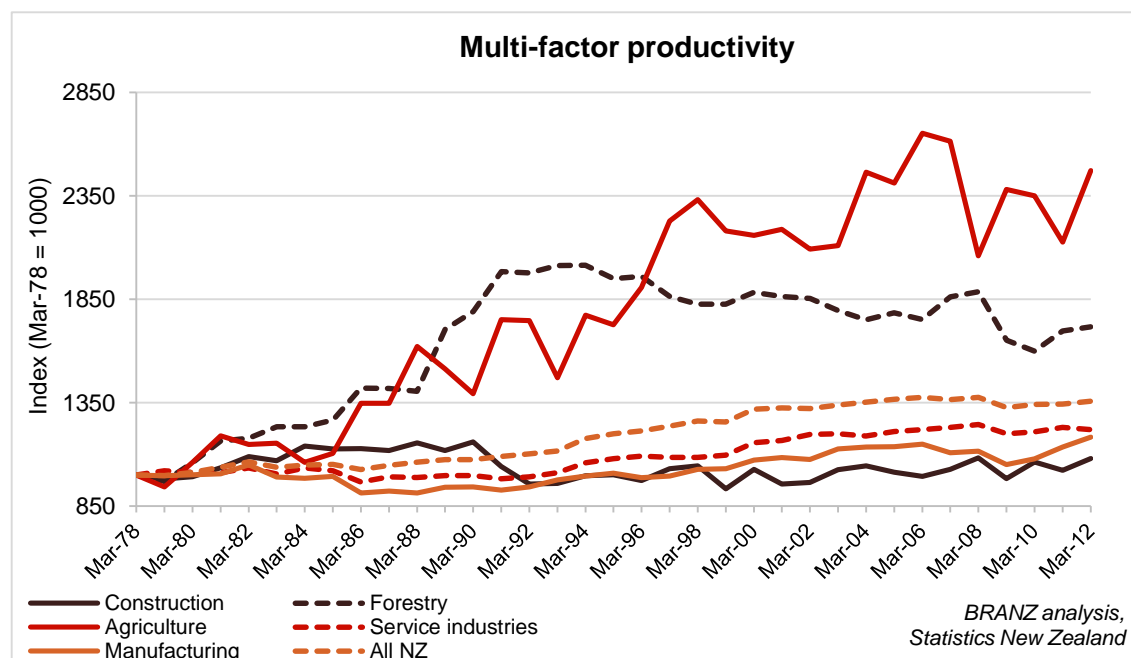
³ Note that Capital Productivity has not been included in this report.

Figure 4. Construction industry multi-factor productivity



Multi-factor productivity in the construction industry is much lower than in comparator industries. The Agriculture and Forestry industries again lead the way in productivity growth. The trends of growth for both industries is very similar to the patterns that can be seen in Figure 3.

Figure 5. Multi-factor productivity of comparator industries⁴



⁴ This chart was incorrect in the previous study report: Page, I., Norman, D. (2014). *Measuring construction industry productivity and performance*.

What does this mean for individual businesses?

The low growth in multi-factor productivity in the construction industry indicates:

- a lack of uptake of technological improvements
- little improvement in the skills of workers
- little change in the management of projects, and
- economies of scale are not being achieved.
- Increased regulatory overhead (which may or may not be justified in improved quality of industry output.)

For multi-factor productivity to improve, the industry needs to be more willing to embrace change and take a longer term view of their business. Multi-factor productivity has barely changed over the last 34 years. This indicates that the industry is relatively slow to adopt new technology, project management and training (contrast this with agriculture for instance).

Due to the boom-bust nature of the industry, there is also an unwillingness to upskill workers. There are perhaps gains to be made for individual businesses through upskilling their workers. They may be able to better weather tough times through maintaining workloads due to the high quality of work or efficient use of time leading to competitive prices.⁵

⁵ PwC. (2011). *Valuing the role of construction in the New Zealand economy*. Figure 9. And Page, I. (2013). *Building industry performance measures part 2*. Figure 7

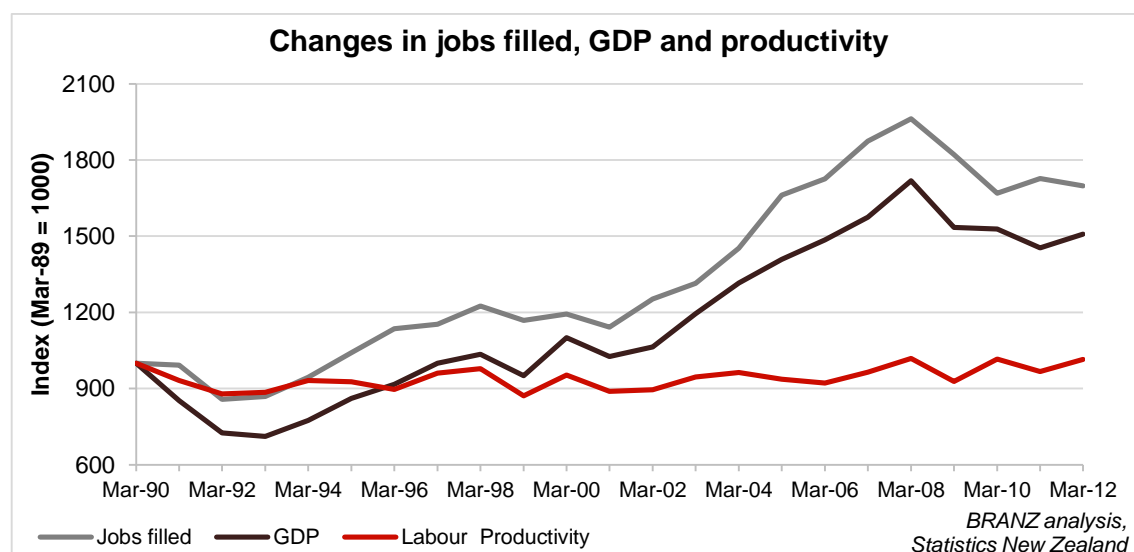
3.3 Changes in jobs filled, businesses, GDP and productivity

Changes in jobs filled, businesses, GDP and productivity allow us to see the relative changes in the industry. It shows how the fortunes of the industry have changed year-on-year, showing boom and bust periods. The authors looked at:

- Changes in jobs filled – this is the change in the number of people working in the industry. It does not take into account the number of hours each worker works
- Changes in FTEs – this is the change in full-time equivalent (FTEs) employees (i.e. if an employee works part-time, they count as half an employee)
- Changes in businesses – this is the change in the number of geographic units (i.e. each 'physical site' or 'business location' rather than the legal business entity⁶).

Jobs filled and GDP track roughly in line with each other over the 23 years shown in Figure 6. This is likely the reason for low labour productivity growth over the period. As construction GDP increases, firms take on more workers. Therefore, given the equation for labour productivity (shown in section 3.1), there will not be a significant change in labour productivity. Jobs filled increased slightly over the year ending March 2012. However, GDP increased more sharply over this period, and therefore labour productivity increased.

Figure 6. Construction jobs filled, GDP and productivity



During the early part of the last upturn (April 2003 to March 2005), the number of FTEs increased at a faster rate than GDP in the construction industry. In the later part of the boom, GDP was growing faster than FTEs and businesses.

The years ending March 2013 and March 2014 saw construction GDP grow by upwards of 12% each year. However, neither FTEs nor businesses grew substantially over the

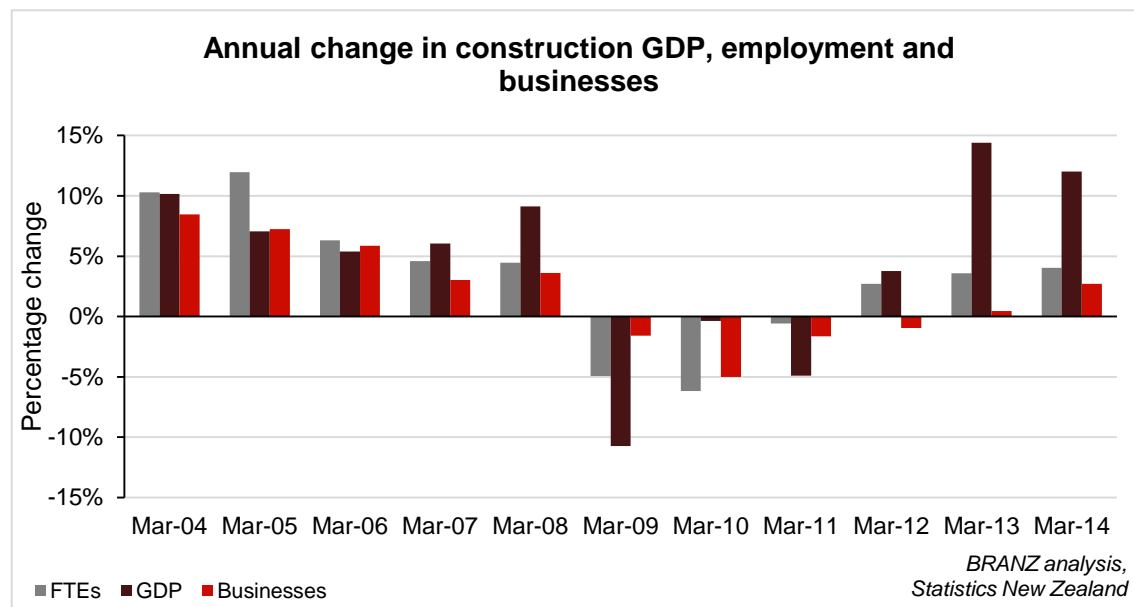
⁶ See

http://www.stats.govt.nz/browse_for_stats/businesses/business_characteristics/BusinessDemographyStatistics_HOTPFeb12/Data%20Quality.aspx

For example, a large firm with 20 offices around New Zealand would be counted as 20 geographical units but 1 enterprise.

same period. Figure 7 suggests that a large number of FTEs and businesses remained during the downturn. Therefore there has not been as much need for the industry to grow the number of FTEs and businesses to keep up with higher GDP in March 2013 and March 2014.

Figure 7. Construction GDP, employment and businesses



It is not immediately obvious whether construction GDP growth is currently being hampered by the lack of growth in FTEs and businesses. In some areas such as Auckland and Canterbury, there will be more work than is able to be done by the current number of workers. However, this will be balanced by workers in other areas that will find work hard to come by at this stage. The ideal scenario would be for underemployed workers to move to high-demand areas (such as Auckland and Canterbury). Yet as previous work by BRANZ has shown, worker migration is not as easy as one might think⁷.

As construction GDP increases, construction firms may find their employees are needing to work longer hours to get work done. It is also likely that should high GDP growth continue to occur, businesses will find that they have more competitors as new businesses start up. This will have an effect on profit margins, worker retention and workloads.

⁷ Page, I., Norman, D. (2014). *Measuring construction industry productivity and performance*.

3.4 Business Size and Construction GDP

Business size and the change in construction GDP shows how the size of businesses change as the construction industry goes through times of growth or decline. Business size tells a slightly different story to that of FTEs as the closing down of businesses is not taken into account in the business size measure. Therefore, when thinking of FTEs and business size together, an improved picture of what is happening/has happened in the industry is formed. Business size is measured by workers per business. This measure includes both the employer and any employees for each business.

The data shows that as the construction industry grows, the average business size increases. Similarly, when the construction industry declines, the average business size declines.

Overall, business size held up quite strongly over the March 2008 to March 2011 period despite the downturn in construction. There was strong growth in the average number of workers per business from April 2001 to March 2008. Businesses were quick to take on workers in the year ending March 2012 and the following years as GDP grew. Since the Canterbury earthquakes, workers per business have increased as construction work has picked up (see for instance March 2012 compared with March 2011).

Figure 8. Construction average business size

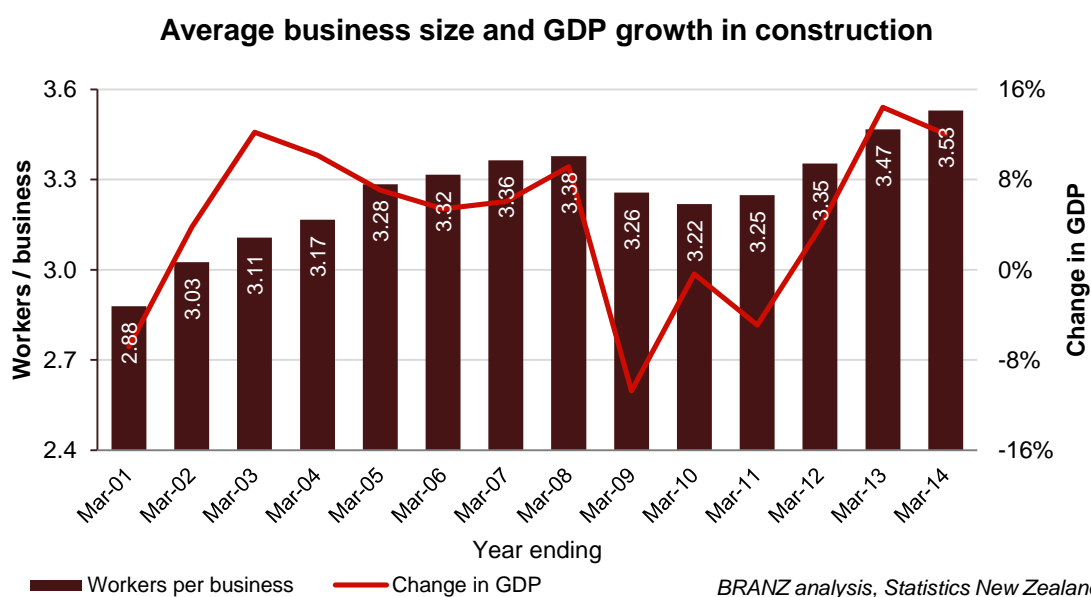
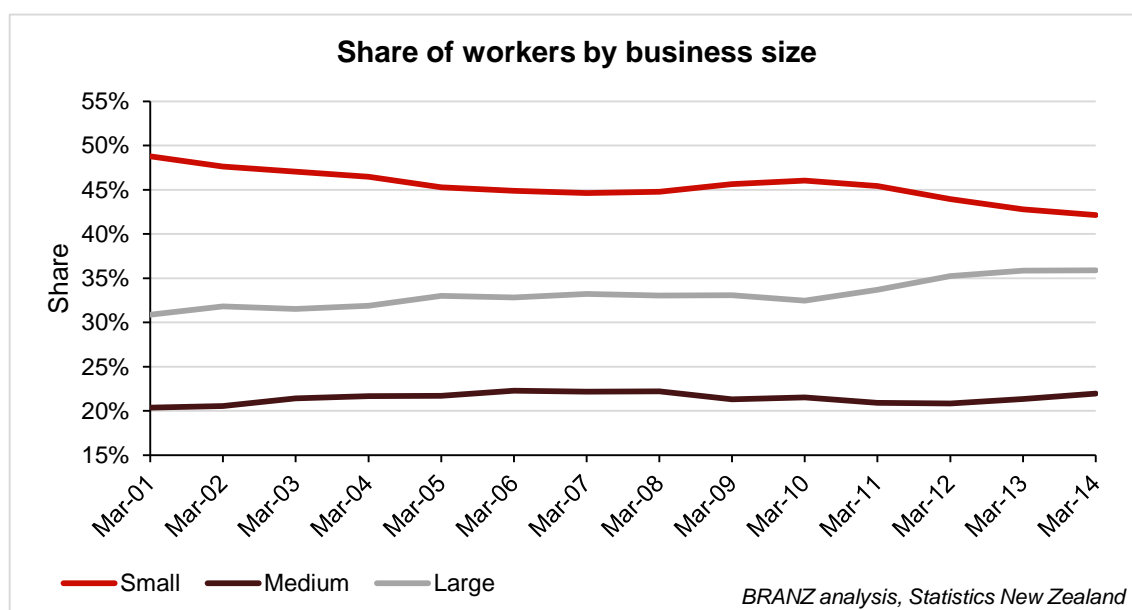


Figure 9 shows that there has been little variation in the proportion of small, medium and large firms over the previous 14 years. The proportion of small firms is trending downwards slightly. Since the year ending March 2010, large sized firms have increased in share by 3.4 percentage points. This has largely been at the expense of small sized firms.

Figure 9. Share of workers by business size



This trend is particularly important for small businesses to note. Small businesses are more susceptible to the boom-bust nature of the industry. Therefore, it is important that small businesses in particular think about how they can prepare for the next downturn.

This does not mean that medium and large businesses do not need to think about how the next downturn will affect their business. Nor that it is only small businesses that should be concerned. However, small businesses will be particularly *hard hit* by the next bust in the construction industry if historical trends are anything to go by.

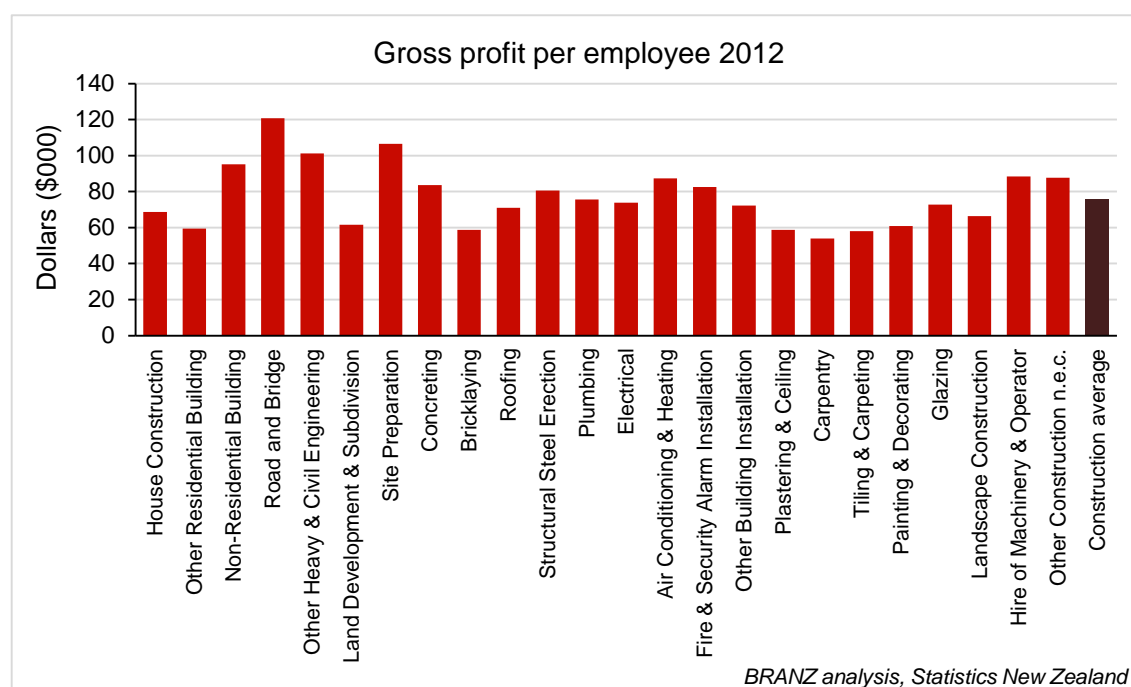
3.5 Gross Profit per Employee by Sub-Sector

The value added per employee looks at the average gross profit per employee. Gross profit is the difference between turnover and the cost of sales. It does not include overheads, payroll or interest payments.

$$= \text{Turnover} - \text{Cost of sales}$$

Value added per employee gives an indication of how well the industry is using labour and supplies in the production process. Figure 10 compares the value added by individual businesses within each sub-industry.

Figure 10. Value added per employee



In general, the best performing sub-sectors are those which are capital intensive. Given that fewer employees are needed in the production process, gross profit per employee is higher than other sub-sectors that are more labour intensive.

Figure 10 provides a benchmark for each sub-sector. Where your performance is worse than the sub-industry average, your business is not performing as efficiently as your competitors.

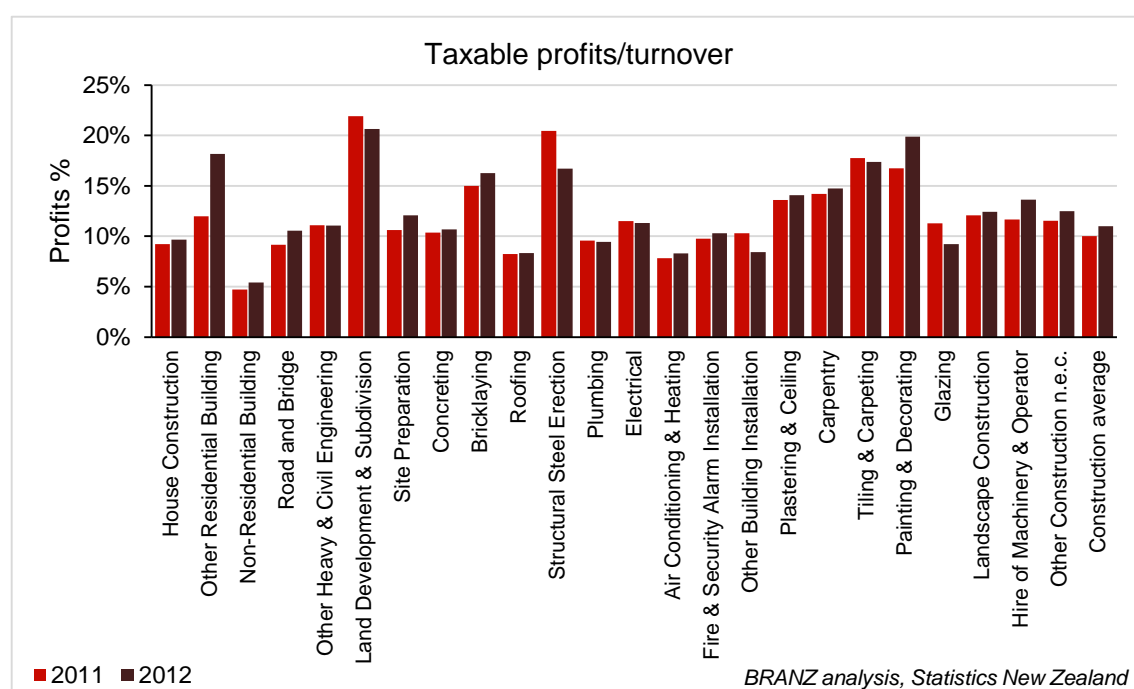
3.6 Taxable Profits over Turnover

Taxable profit is turnover minus cost of sales, overheads and payroll. The taxable profits over turnover measure gives a good indication of the profitability of each sub-industry.

Overall, taxable profit margins average about 11% in the construction industry. On a sub-industry level, two-thirds of sub-industries had an increase in profit margins between 2011 and 2012.

Profit margins do vary significantly in the industry. In 2012, the profit margin for non-residential building was just 5%. The most profitable sub-industries were 'land development and subdivision' and 'painting and decorating' with average profit margins of around 20%.

Figure 11. Taxable profits/turnover

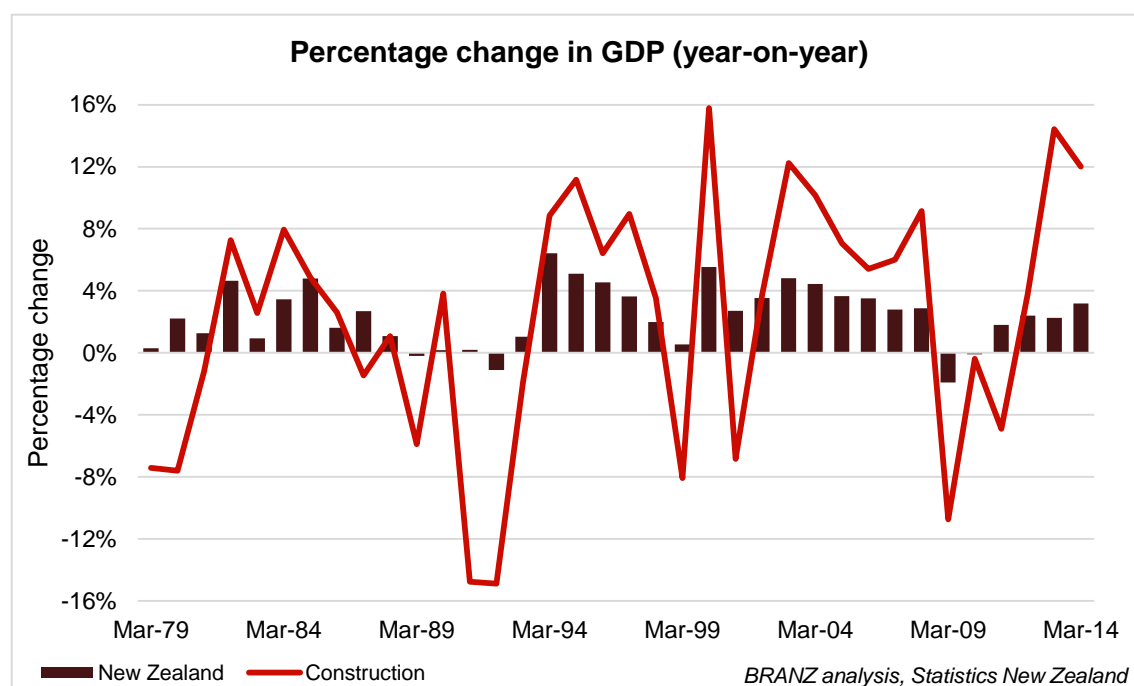


This data is useful for businesses as they can compare their profit levels with the average for their sub-industry. Some of the sub-industries have very poor returns. It is important that businesses in these sub-industries as well as firms with below average taxable profits over turnover improve their returns. This can be achieved through improving turnover, or reducing costs of sales, overheads, or payroll.

4. THE CURRENT UPTURN

The current upturn does not look all that dissimilar to previous upturns. However, it is uncertain how long the current upturn will continue. The percentage growth in the year ending March 2013 was the second highest that the industry has experienced over the period shown in Figure 12. However, the growth experienced in March 2000 was likely a rebound after the downturn linked to the Asian financial crisis. There was a loss of confidence during the crisis that led to people putting off construction work for a year.

Figure 12. Construction industry GDP



The booms and busts of the construction industry shown in Figure 12 may look dramatic when compared to the GDP of New Zealand. However, it is worth remembering that this is in part the result of comparing one sub-sector to the weighted average performance of all sub-sectors in the economy.

Nevertheless, the data does show the importance of resilience. Businesses need to be prepared to scale up quickly in upturns, and to weather the downturns.

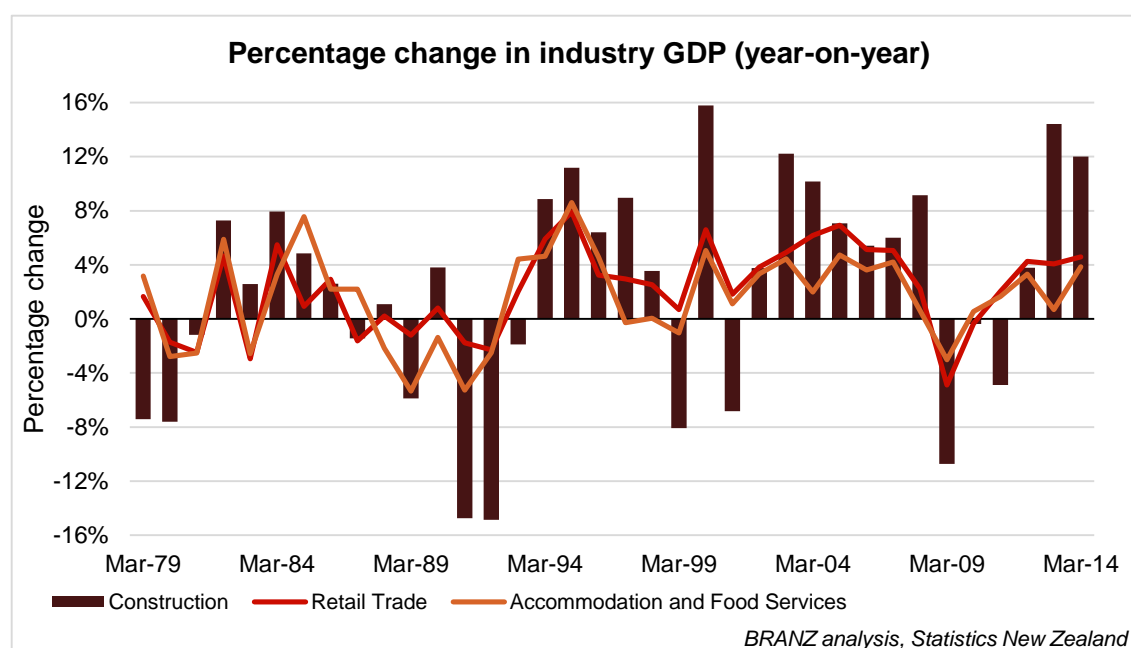
4.1 Construction GDP and Comparator Industries

This section compares the construction industry to the retail trade and accommodation and food services industries. Like construction (particularly residential), these latter two industries are commonly used barometers of consumer sentiment. The fortunes of these three industries tend to be subject to consumers' perceptions of their economic well-being.⁸

Construction looks to be more susceptible to economic conditions and consumer sentiment than its comparators, as Figure 13 shows. In the most recent downturn, accommodation and food services and retail trade held up much better than construction. This may have been linked to, for instance, strong growth in Australian tourism to New Zealand as the downturn in that country prompted Australians to holiday closer to home.

Nevertheless, booms and busts in construction have tended to be larger in construction than in comparator industries across time, and not just in the latest cycle. For instance, changes in the early 90s and again in the late 90s impacted construction far more than the other industries.

Figure 13. Construction industry GDP and comparator industries



The growth in construction industry GDP in 2013 and 2014 looks particularly strong compared to the comparator industries. This is likely the effect of the Canterbury rebuild and the demand for housing in Auckland, which have increased construction industry GDP by significantly more than it has for comparator industries.

The boom-bust nature of the industry has impacts on individual businesses, such as needing to plan for the next bust during times where workloads are strong. As highlighted previously in this report, business can be better prepared if they understand their pipeline better and have appropriate project management processes.

⁸ See PwC. (2011). *Valuing the role of construction in the New Zealand economy*.

5. THE CANTERBURY REBUILD

The Canterbury rebuild has been a big part of the growth in construction GDP in New Zealand. Therefore, it is important to understand the effect of the Canterbury rebuild on overall construction growth.

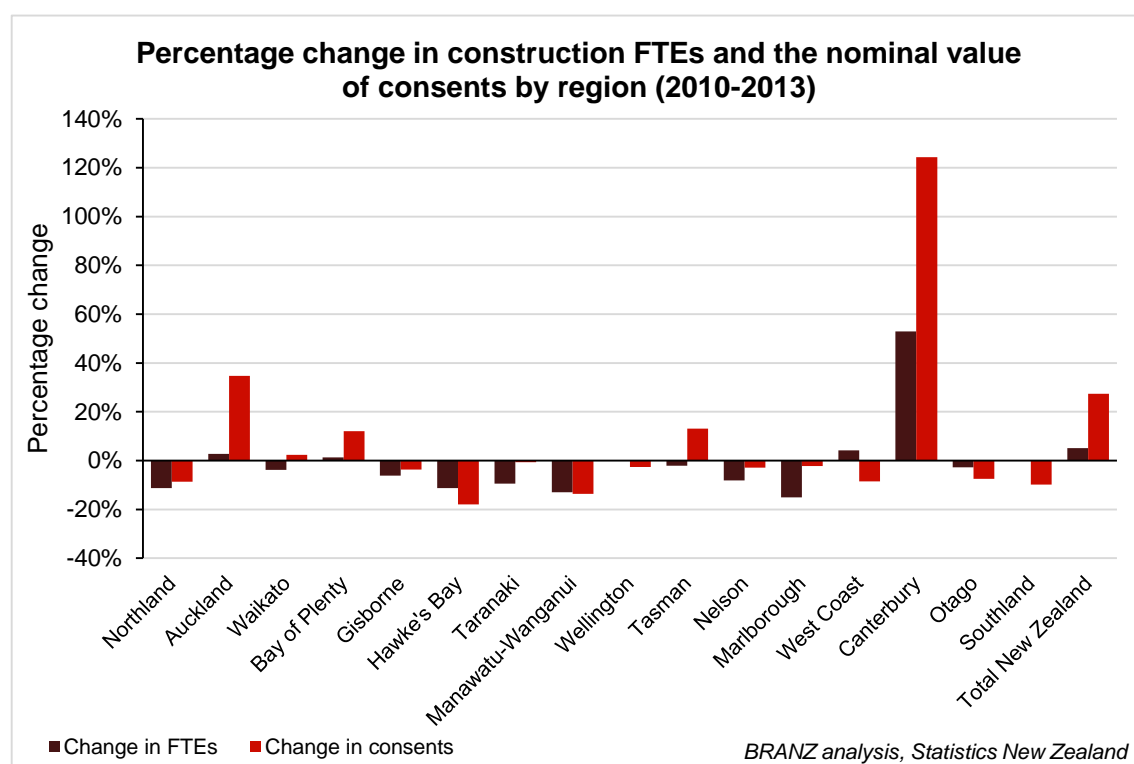
Looking at the percentage change in construction FTEs and consent values by region helps determine what areas may be under pressure to deliver expected workloads, or areas where excess capacity may exist.

The nominal value of consents is the unadjusted (for inflation) consents value for the region. It informs us of the expected workloads in the industry over the months to follow, and provides a rough guide as to how much new labour will be needed.

Figure 14 shows the biggest growth in the value of consents has been in Canterbury. Only Auckland, Waikato, Bay of Plenty and Tasman regions also had an increase in the nominal value of consents between 2010 and 2013.

Canterbury also saw the biggest growth in the number of construction FTEs. The New Zealand construction industry had a small growth in the number of FTEs between 2010 and 2013. However, growth was minimal in some regions, whereas the majority of regions lost FTEs. These losses were likely due to reduced workloads in these regions. Some of these workers moved to Canterbury, but others have left the industry.

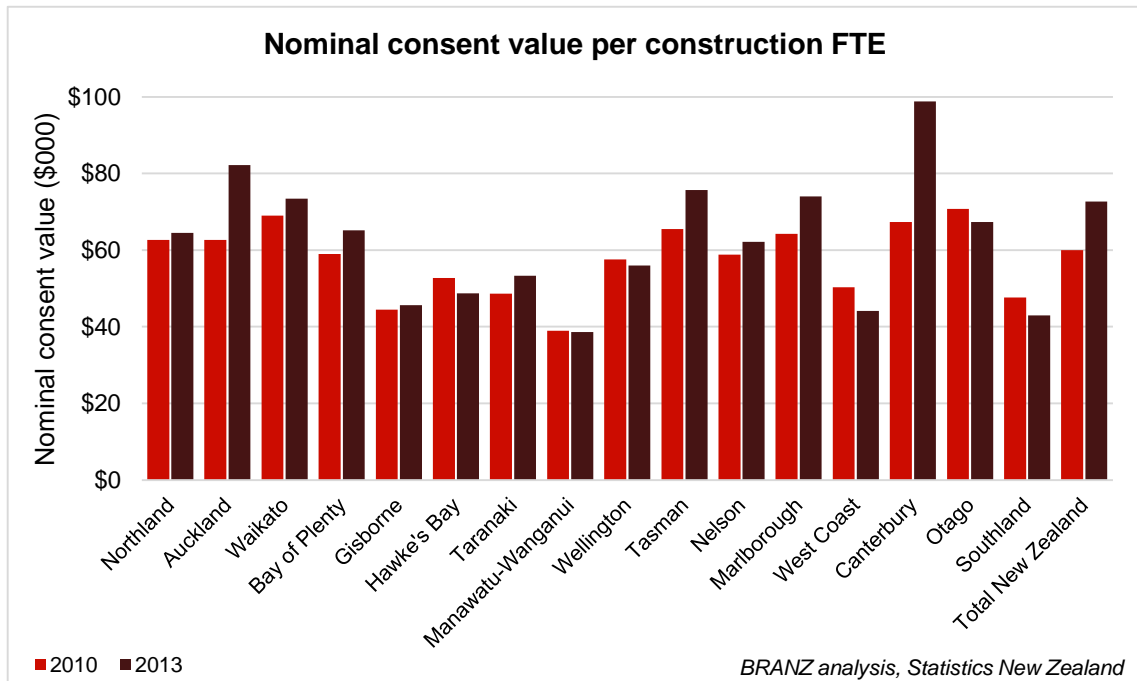
Figure 14. Construction FTEs and consents growth around New Zealand



The nominal value of consents divided by the number of FTEs gives the nominal value of consents per construction FTE. This informs us of what the expected workload is for each FTE. Big increases in Canterbury help explain the pressures that workers in the

area are under. The national average in 2013 was about \$73,000. In Canterbury, it was just under \$100,000.

Figure 15. Nominal consent values in Canterbury



It is good for individual businesses to maximise the consent value per construction FTE. In some regions, this value is quite low, indicating businesses in these regions may be finding their profit margins being squeezed (or even finding that they are making losses). There does appear to be little need for businesses to be taking on additional workers outside of Auckland and Canterbury.

5.1 Worker Turnover in Canterbury

Worker turnover shows the rate of workers entering and leaving jobs. This is measured as follows:

$$= \frac{4 \text{ quarter worker accessions} + 4 \text{ quarter worker separations}}{4 \text{ quarter average of jobs filled}}$$

Historically, the construction sector had lower worker turnover than the overall rate for Canterbury. However, worker turnover is now about the same. This is largely due to worker turnover in the construction industry in Canterbury rising steadily between June 2010 and June 2012 as the earthquake rebuild has stepped up.

This means workers are far more likely to shift between jobs than they did pre-quakes, perhaps as they search for jobs that pay better or carry more benefits for them.

Figure 16. Worker turnover in Canterbury

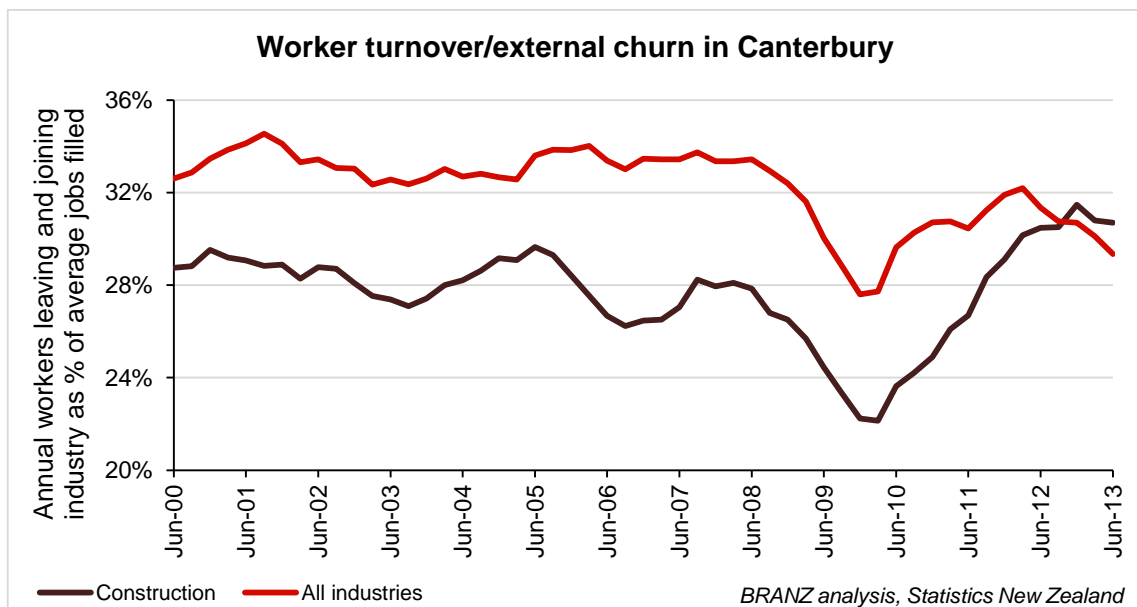
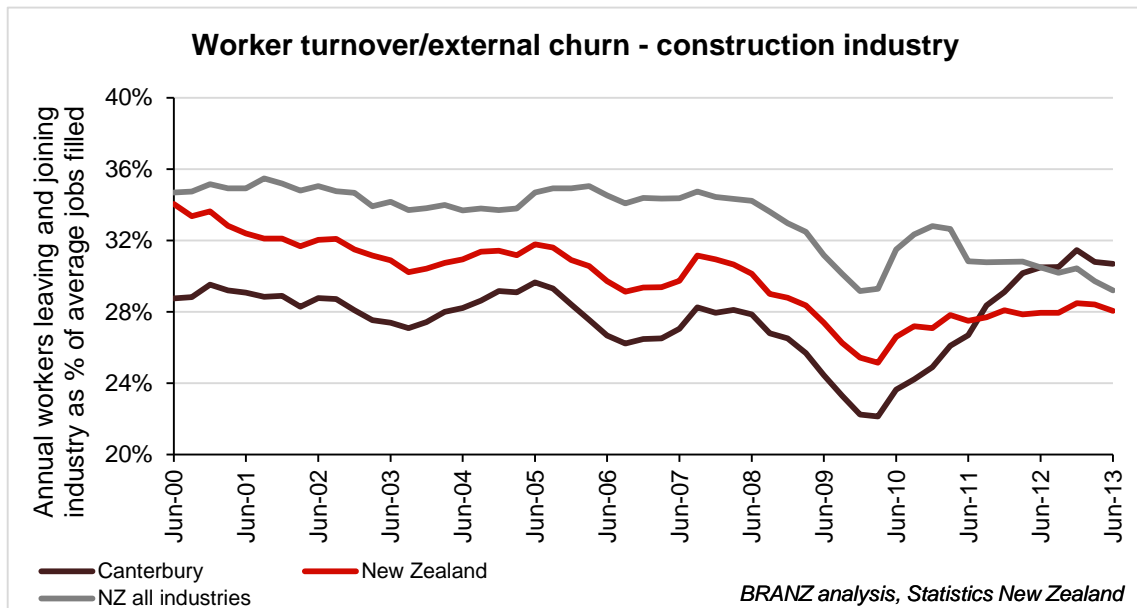


Figure 17 shows that the construction industry in Canterbury typically had lower worker turnover than the construction industry in New Zealand overall. In turn, the construction industry in New Zealand overall has lower worker turnover than the average for all industries in New Zealand.

Figure 17. Worker turnover in construction industry



This data shows that there are good opportunities in Canterbury for workers and the churn rate has increased. The implication is that workers are now more likely to leave for a better deal. Therefore, businesses may find that there is a need to pay key employees more in order to retain good skills, or offer other incentives to keep them where demand for skills is high.

This higher rate of worker turnover is likely bad for labour productivity. Businesses need to train new people, help them understand different processes and integrate them into an existing team. Therefore firms need to be proactive in retaining staff.

6. ARE WE SEEING THE PRODUCTIVITY GAINS EXPECTED?

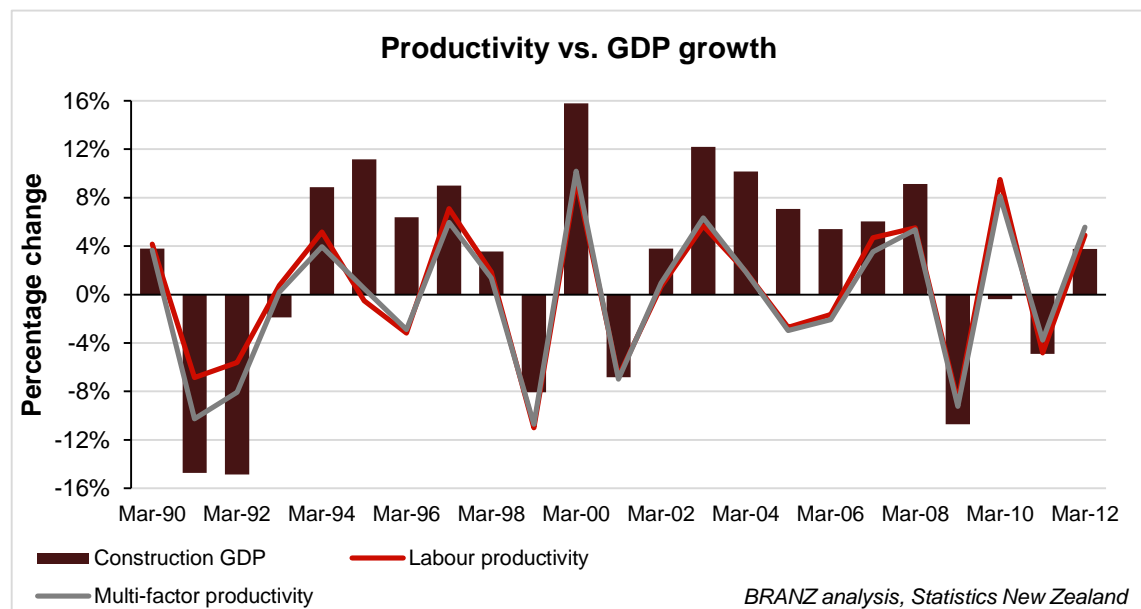
Figure 18 shows the changes year-on-year in construction GDP, labour productivity and multi-factor productivity.

The changes in labour productivity and multi-factor productivity are almost identical. It looks like productivity grows when GDP does (and productivity falls as GDP does). It is also of note that GDP increases at a faster rate than productivity. The implications here are that:

- GDP growth is partly achieved through throwing more labour at the workload as well as higher productivity by existing workers
- The industry may be too quick to take on additional labour, and even retain staff when workloads decrease
- Contrary to some views of when productivity growth occurs, in construction it occurs when the industry is in an upturn, rather than when it is shrinking. Some have suggested that in slowdowns, productivity picks up as fewer workers are retained to do the work and only the more essential workers are retained

The construction industry has seen productivity growth exceeding GDP growth in the years ending March 2010 and March 2012, in contrast to most other periods. The result in March 2012 will be down to the Canterbury rebuild, with a large increase in the amount of work being done with a much smaller increase in the number of workers.

Figure 18. Productivity and GDP growth

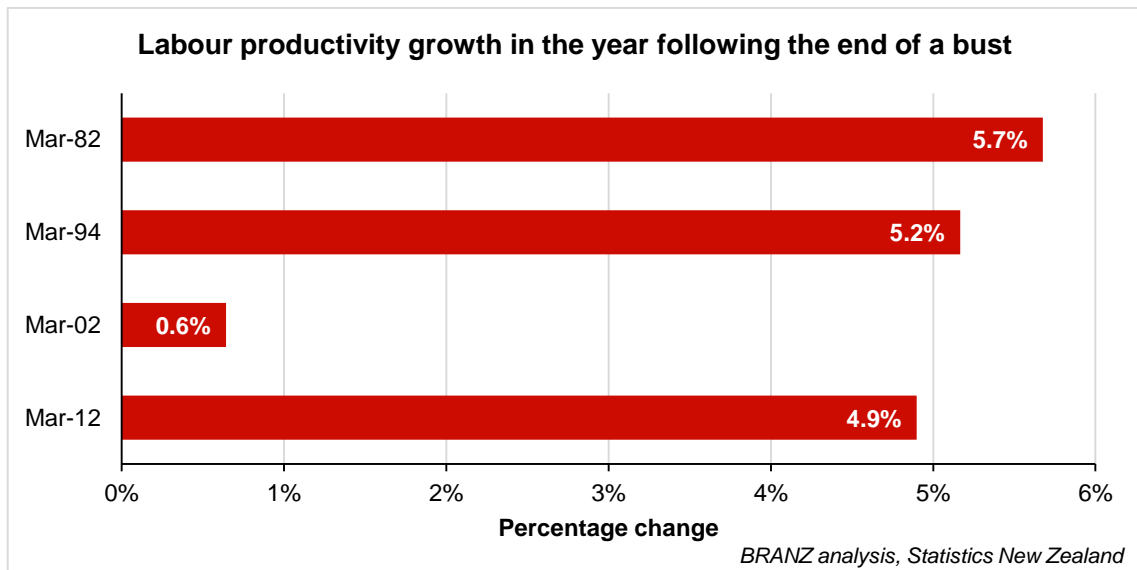


The real challenge for the industry is to grow productivity at the same pace as GDP (or even exceed it). This would imply better use of existing labour resources, or employing better project management and technology to grow productivity.

6.1 Labour Productivity Growth Following a Bust

Labour productivity growth is typically very strong in the year immediately following the end of a bust (i.e. the start of the upturn). This is due to pent up demand driving construction GDP up as workloads pick up and existing workers do more work. However, there is a lag between the increase in GDP and the construction industry taking on new workers, as identified previously. Therefore, labour productivity grows sharply early on in the upturn.

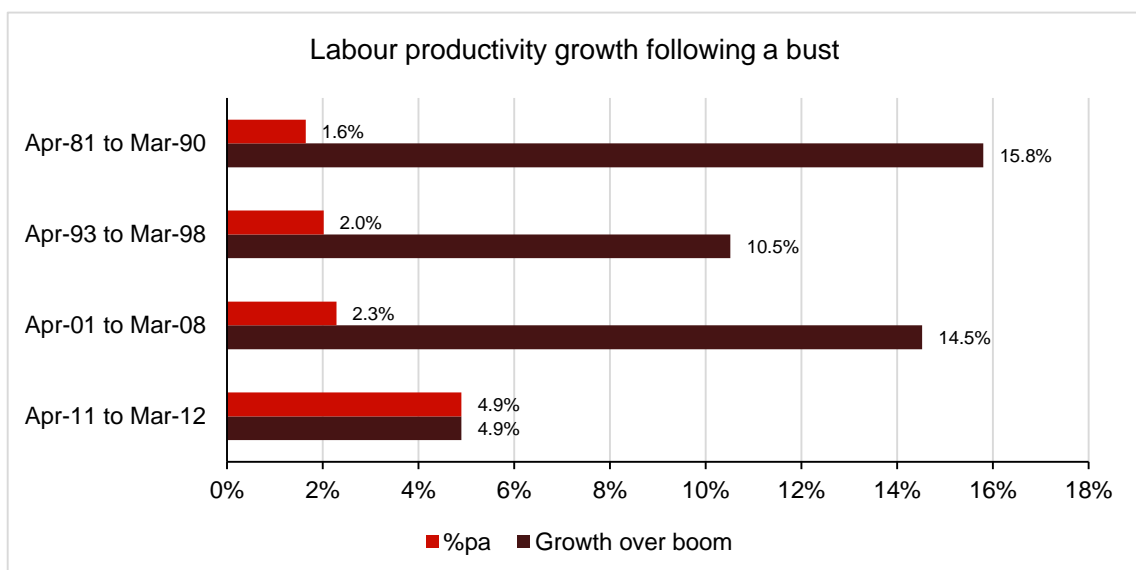
Figure 19. Labour productivity in the year following the end of a bust



The spike in labour productivity growth following the latest bust was not quite as sharp as the spikes following busts in the early 80s and mid-90s. This suggests that the industry has previously been able to pick up the post-bust slack quite well through greater productivity.

However, this high level of productivity growth is not maintained throughout the upturn. Growth per annum over the upturn-boom period typically sits between 1.4% and 2.3%.

Figure 20. Labour productivity growth across the upturn-boom



It is interesting to note that the rate of labour productivity growth over the three previous upturns-booms increased, from 1.6% per year to 1990, to 2.3% per year in 2008. This raises the question: Will annual labour productivity over the current upturn grow even more sharply?

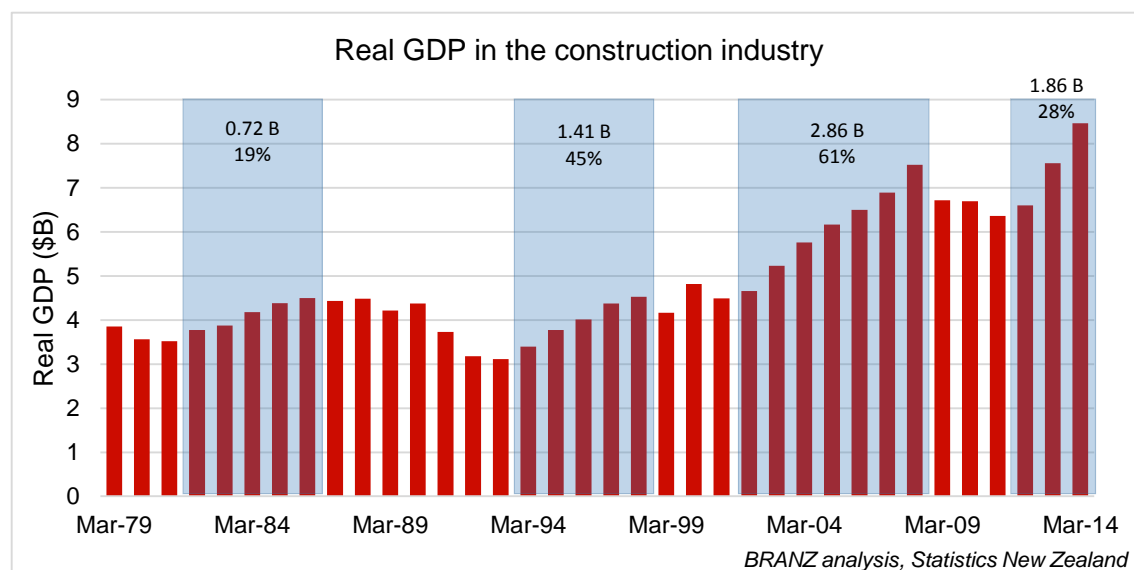
It is imperative that businesses figure out how they can use better processes, management and technology to sustain these productivity gains.

From Figure 18 we can see that labour productivity does not always grow when construction GDP grows (e.g. March 1996 and March 2005-2006). Therefore, it is a challenge for the industry to maintain labour productivity growth across the upturn-boom period, as well as to maintain higher levels of productivity after the boom.

7. ARE THERE SIMILARITIES TO PREVIOUS UPTURN-BOOM CYCLES?

Upturns of the scale the industry is currently seeing are not unprecedented. However, while the absolute growth in activity in the current boom is similar to that seen previously, the percentage per annum growth has been stronger. For instance, the period between March 1994 and March 1998, and March 2002 and March 2008 show similarities in scale to the upturn over the last three years. However, the Canterbury rebuild means work has scaled up more rapidly than in previous upturns.

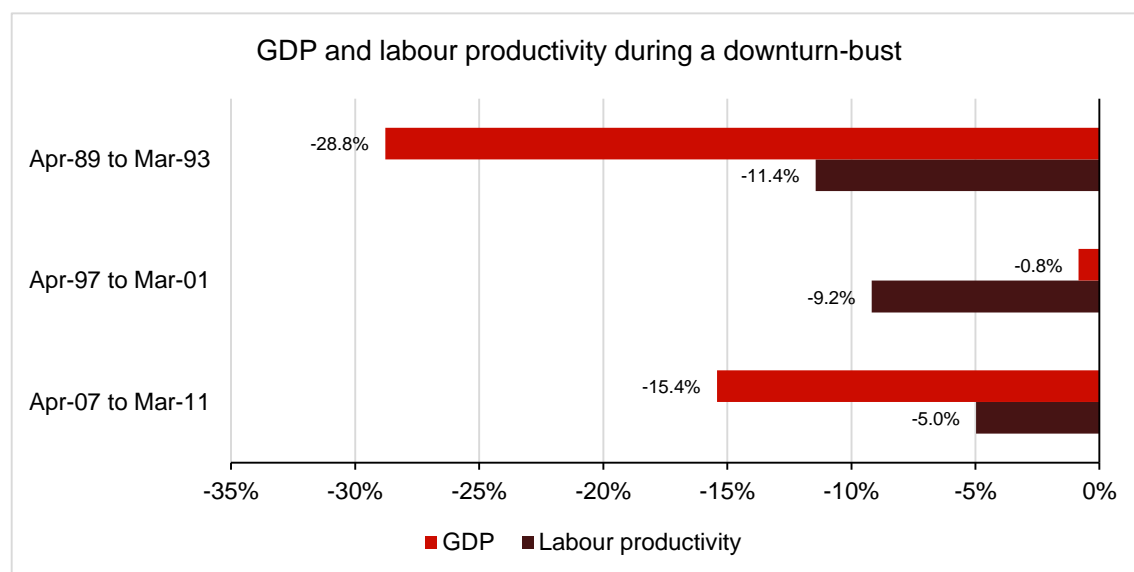
Figure 21. Real GDP in the construction industry



The scale of the current upturn is well below that of the previous upturn in both absolute dollars and percentage terms.

Historical booms have been followed by fairly severe downturns, as highlighted by Figure 22.

Figure 22. GDP and labour productivity during a downturn-bust



Following the first boom illustrated above, construction GDP fell by almost 30% and labour productivity fell by 11.4%. The period of March 1999 to March 2002 was interesting, in that it was not a long-term downturn. Construction demand was hampered by the Asian financial crisis. This caused a bit of a stutter in local GDP, with construction GDP falling slightly during the period, and labour productivity falling by 9.2%. Finally, the most recent downturn-bust saw a decrease in construction GDP of 15.4% and a decrease in labour productivity of 5.0%.

Interestingly, the fall in labour productivity was lowest in the most recent downturn-bust, suggesting that businesses were more likely to respond by reducing headcount than in previous busts.

Nevertheless, the overall pattern in productivity follows that set out in Figure 1 in the Introduction: as workloads rise, existing workers pick up the slack, boosting productivity. As workloads continue to grow, more workers are taken on and productivity stabilises or even falls slightly. Then as workloads fall (the downturn), businesses hoard workers and productivity falls. Finally they shed workers and productivity stabilises at a lower level.

If history repeats, the industry can expect a sizeable bust in the next 10 years if the industry and government do not work together to increase resilience of the industry to changes in the economic cycle.⁹

⁹ See PwC. (2011). *Valuing the role of construction in the New Zealand economy*.

8. WHERE TO FROM HERE?

This study has shown that productivity gains in the construction industry are weak primarily because of a lack of structural change. Businesses are slow to shed workers, meaning the average workload falls during downturns. This slack picks up when the upturn begins, but as work grows, productivity gains taper off.

The fact that businesses hold on to workers as workloads fall is not necessarily a bad thing. It is bad for official productivity measures, but is good for holding on to skills, keeping people employed, and stopping skills leaving New Zealand.

However, the industry as a whole and smaller businesses in particular need to do a lot more to increase resilience so that they are able to better withstand the inevitable downturn that will follow the current upturn-boom.