STUDY REPORT

SR 321 (2014)

A Construction Dashboard of Key Industry Measures

David Norman

Matthew Curtis

Ian Page

Funded by BRANZ from the Building Research Levy

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Preface

This study follows on the work completed in QR0027 – *Measuring construction industry productivity and performance*, and in QR0040 – *Potential measures of productivity and performance at the firm, grouped firm and regional level*.

The measures identified in the previous reports have been used to develop a Dashboard of key performance indicators (KPIs) that are displayed at www.constructiondashboard.nz. These KPIs will be updated over the life of the project and beyond if funding allows.

Acknowledgments

This work was funded by the Building Research Levy.

A Construction Dashboard of Key Industry Measures

BRANZ Study Report SR 321

David Norman, Matthew Curtis and Ian Page

Abstract

The Construction Dashboard is intended to help industry bodies, individual builders, government and training providers understand what is happening in the industry today, and where it is headed tomorrow. It does this by providing an interactive summary of key indicators explaining the current state of the industry, and forecast changes.

BRANZ, working closely with the building industry, government, and training providers, developed a short-list of indicators through a collaborative workshop and follow-up discussions with relevant data owners.

The final Dashboard was developed and published at www.constructiondashboard.nz. Indicators included are:

- Share of skills provided by training
- Liquidity ratio
- New residential customer service
- Workplace injury rates
- Housing affordability
- Building activity forecasts
- Changes in building quality.

The Dashboard will be updated every three months over the project horizon as new data becomes available.

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1. EXECUTIVE SUMMARY

The Construction Dashboard is intended to help industry bodies, individual builders, government and training providers understand what is happening in the industry today, and where it is headed tomorrow. It does this by providing an interactive summary of key indicators explaining the current state of the industry, and forecast changes.

The development of the Dashboard was funded by the BRANZ Research Levy as part of a wider programme on productivity and performance in the industry.

The Dashboard project began by identifying a list of over 30 potential performance, productivity and forecast measures. BRANZ was able to reduce the number of potential indicators to a group of around a dozen to discuss with stakeholders.

BRANZ, working closely with the building industry, government, and training providers, whittled the list of indicators down further through a collaborative workshop and follow-up discussions with relevant data owners.

Participants and contributors to the discussion included:

- Building and Construction Industry Training Organisation (ITO)
- Certified Builders Association of New Zealand
- Construction Strategy Group
- Infratrain (the civil engineering ITO)
- Ministry of Business, Innovation and Employment
- Ministry of Education
- New Zealand Specialist Trade Contractors Federation
- Registered Master Builders Association of New Zealand
- The Skills Organisation (the construction trades ITO).

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- Changes in building quality.

The Dashboard will be updated every three months over the project horizon as new data becomes available.

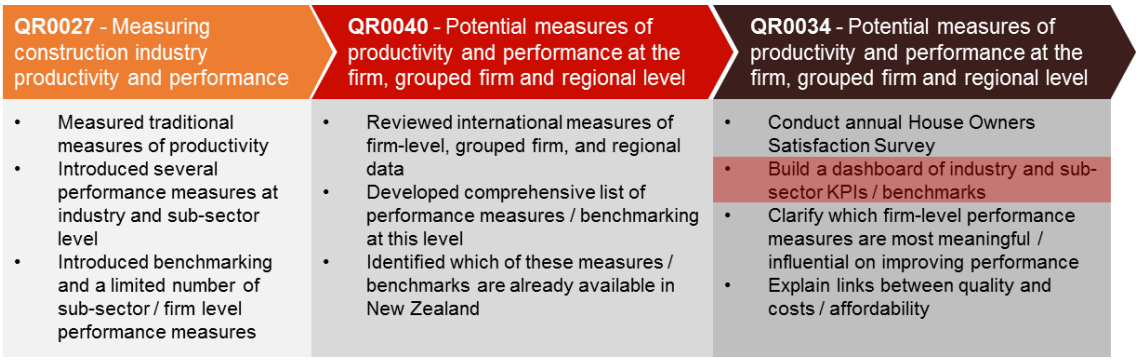
2. PREVIOUS WORK

BRANZ completed two projects in the year to March 2014 that provided the foundation for this work:

- QR0027 – Measuring construction industry productivity and performance[1]
- QR0040 – Potential measures of productivity and performance at the firm, grouped firm and regional level.[2]

Figure 1 shows how those projects are related to the current levy project (QR0034) and specifically to the Dashboard work (highlighted in pink).

Figure 1 How this project builds on previous work



QR0027 first introduced the distinction between productivity and performance. It highlighted some of the limitations of traditional productivity measures, and some of the reasons why the construction industry may have recorded poor productivity growth. It initiated an examination of what measures could be used to monitor industry or firm level performance. This topic was taken further by QR0040, where the focus was specifically on measures of performance at the firm, grouped firm and regional level.

QR0034 tackles a number of performance related topics. The specific focus of this report is the rationale for a number of industry and sub-industry key performance indicators (KPIs) included in the Construction Industry Performance Dashboard published at www.constructiondashboard.nz.

2.1 The distinction between productivity and performance

Technically, **productivity** refers to the output or production of an industry or business divided by its inputs (labour and/or capital). Productivity measures (such as dollars of Gross Domestic Product or GDP generated per worker) are not very meaningful on their own. Trends in productivity across time or industry comparisons are required to understand whether a productivity value is good or not.

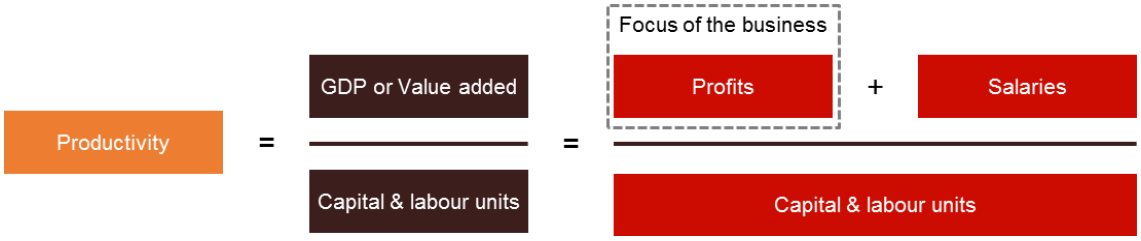
[1] Page, I; and Norman, D. (2014). *Measuring construction industry productivity and performance*. BRANZ.

[2] Page, I; and Norman, D. (2014). *Potential measures of productivity and performance at the firm, grouped firm and regional level*. BRANZ.

Performance focuses on effectiveness, or how well something achieves its intended purpose. There is an overlap between performance and productivity; typically, where performance of the firm or industry improves, productivity in the technical sense also improves. It is important to note that business owners often talk about "productivity" in a non-technical sense, where they really mean improving the "performance" of their firm. In this study, we use the word "productivity" in the technical sense. We use "performance" to describe what business owners may colloquially refer to as productivity.

As Figure 2 highlights, the individual firm exists primarily to **maximise value for its shareholders**.

Figure 2 There is a clear relationship between profits, GDP and productivity



Technical definitions of productivity, while valuable at an industry-wide level, are far removed from the daily operations of the individual business. Bearing these facts in mind, an earlier BRANZ report made the argument that businesses do not prioritise productivity in the technical sense (units of output divided by units of input).

Maximising profitability (increasing performance) is directly linked to productivity in that it is part of GDP, somewhat simplistically presented here as profits plus salaries. However, **productivity in and of itself is not the goal for the business**.

Productivity and its constituent components (GDP or production, employment, hours worked) is typically measured at the industry, and occasionally sub-industry level when data allows. **Performance** can be measured and benchmarked at the industry, sub-industry and firm level, as shown in Figure 3.

Figure 3 Levels of measurement: Productivity and performance

As part of QR0040, we identified more than 30 possible firm-level benchmarking and performance KPIs. These are listed in the appendix.

2.2 What this means for the Dashboard

The Dashboard measures a mix of productivity and performance KPIs at the industry and, where possible, the sub-industry level. This allows a range of industry, training and government stakeholders to access key indicators at a glance.

3. FROM LONG-LIST TO WORKSHOP

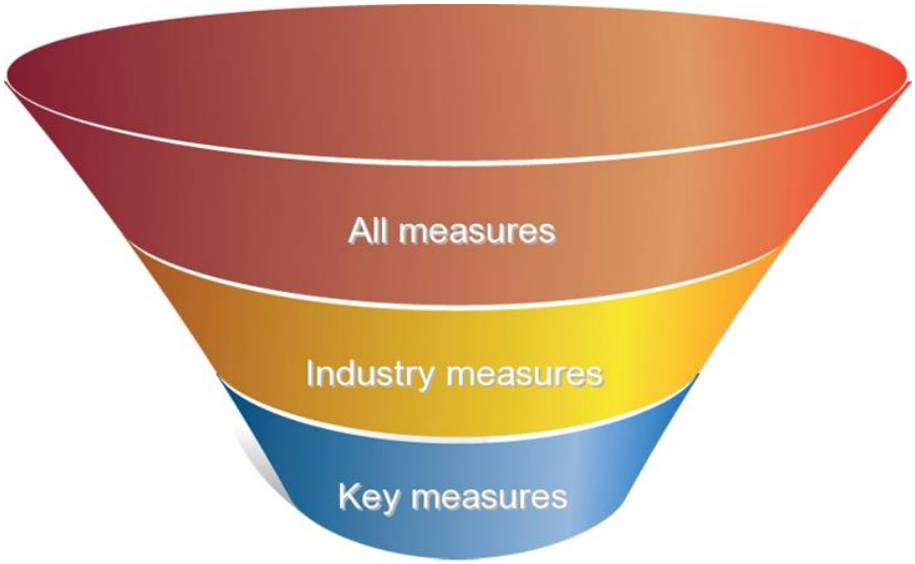
This section explains how BRANZ developed the final list of Dashboard measures from an initial list of more than 30 possible measures.

3.1 A preliminary dashboard

BRANZ began this study by assembling a complete list of potential measures, regardless of level (industry, sub-industry or firm) from previous studies of performance in the construction industry. This yielded over 30 different measures across several facets of industry performance including official measures of productivity, financial, employment, safety, customer satisfaction, management process, innovation, and forecasting measures.

BRANZ reviewed this large number of potential measures for inclusion and narrowed these down to 15 by excluding measures that were more appropriate for firm level performance or benchmarking. Many measures that were very similar to, or were proxies for other measures were excluded. This funnelling approach is set out in Figure 4.

Figure 4 Narrowing down the list of potential dashboard measures



The list of 15 measures was still seen as more than would be appropriate for a dashboard, but was a useful starting point for discussion with industry, training organisations and government.

Figure 5 sets out the 15 indicators (grouped into five sub-categories) and what we were looking to measure. BRANZ was of the view that it would be useful to have at least one indicator from each category.

Figure 5 The preliminary dashboard indicators

Monitor skills and capacity	Measure activity in the industry	Compare official and other productivity measures	Forecast future demand	Evaluate management & performance
Apprenticeships	Gross fixed capital formation (GFCF)	Labour productivity (official)	GFCF forecats (BRANZ)	Customer satisfaction (meeting client needs)
Construction workforce size	Value of building consents issued (BC)	Multi-factor productivity (official)	BC Forecasts (BRANZ)	Injury rates (workplace safety)
Worker turnover rate		GFCF / construction workforce size		Prefabrication rates (driving efficiency)
		Value of BC / construction workforce size		Solvency (good financial housekeeping)

BRANZ

A more detailed description of each indicator follows:

- **Apprenticeships**: Measures changes in the number of apprenticeships to help the industry understand the extent to which it will be prepared for expected levels of demand.
- **Value of building consents issued and forecasts**: Measures the current level of activity in the construction industry, and helps forecast future activity to help the industry plan for future demand. Available for three sub-sectors (residential, non-residential, and non-building construction).
- **Construction workforce size**: Measures changes in the number of people employed in the industry, another measure of capacity to meet demand.
- **Customer satisfaction** (residential and construction trade services sub-sectors only): This is a BRANZ-developed performance measure of overall satisfaction with the performance of the residential construction industry among new house owners. This indicator will help the residential and construction trade services sub-sectors (more than 50% of the industry in New Zealand) understand the extent to which they are meeting customer expectations.
- **Gross fixed capital formation (GFCF) and forecasts**: Measures actual building work (fixed assets such as housing, commercial buildings and roads) put in place. GFCF can also be used to forecast future building activity.
- **Injury rates**: Measures how workplace safety is changing. Compared to data for comparator industries such as agriculture, forestry, and utilities.
- **Labour productivity**: Official Statistics New Zealand measure of how productive each paid hour of labour is in contributing to total production of the industry. Compared with growth in all-industry labour productivity.
- **Multi-factor productivity**: Official Statistics New Zealand measure of the impact of factors like long-term technology changes; improved skills, management and training; and economies of scale. Compared with growth in all-industry multi-factor productivity.
- **Prefabrication rates**: Measures changes in prefabrication uptake in the residential and non-residential sub-sectors over time. Prefabrication is seen as a measure of quality and efficiency, with more prefabrication meaning greater efficiencies in construction.
- **Solvency** (liquidity): Measures the financial sustainability of four sub-industries.

- **Worker turnover rate**: Measures the extent to which workers enter and exit the construction industry. Compared to all-industry averages.

3.2 Industry workshop

A workshop was held with representatives from the building industry, industry training organisations, and government. Attendees included:

- Building and Construction Industry Training Organisation (BCITO)
- Certified Builders Association of New Zealand
- Construction Strategy Group
- Infratrain (the civil engineering ITO)
- Ministry of Business, Innovation and Employment
- New Zealand Specialist Trade Contractors Federation
- Registered Master Builders Association of New Zealand
- The Skills Organisation (the construction trades ITO).

3.2.1 Participant views on initial indicators

At the workshop, attendees considered the preliminary dashboard indicators put forward by, but were also invited to suggest other indicators for consideration. Views on indicators included:

- **Apprenticeships**: There was interest in an apprenticeship measure that helped explain **the gap** between demand and supply of trained apprenticeships. This would require ITOs to provide:
    - current enrolments by occupation
    - forecasts of completion rates by occupation by year
    - labour demand forecasts by occupation.
- **Building consents / GFCF**: One or both of these measures would be used to develop a picture of levels of recent activity and forecasts for the next three to five years.
- **Construction workforce size**: This indicator was only seen as having use if it tied into the indicator that showed the gap between demand and supply of skills.
- **Customer satisfaction**: This indicator was supported despite being limited to the residential sector.
- **Injury rates**: Participants showed strong interest in this indicator as long as it provide some indication of the seriousness of different injuries. Participants were also interested in understanding the real change in number of injuries (and their seriousness) since changes in workplace safety regulation such as working at heights regulation.
- **Labour / Multi-factor productivity**: Attendees noted that these official measures are publicly available and that therefore including them would not be adding much. They were not seen as particularly meaningful indicators of actual changes in the industry.

- **Prefabrication rates**: This was suggested as a measure of efficiency, but was not considered especially useful. Alternatives (discussed below) were suggested.
- **Solvency** (liquidity): Some measure of financial performance was strongly supported although participants seemed happy to leave that judgement to BRANZ.
- **Worker turnover rate**: Participants were interested more in the industry's ability to train and retain skills (see earlier discussion) than worker turnover although movement between jobs in the industry was an interest (see below).

3.2.2 Additional measures suggested by participants

Participants suggested a number of other indicators that should be investigated for inclusion in the dashboard. These included:

- **Efficiency**: Measures such as a $/m^2 ratio or something similar as a measure of efficiency. BRANZ had examined these measures in some detail in a study published in March 2014. That report set out why these measures were hard to develop.[3]
- **Input impact on housing affordability**: Several participants pointed to the rising costs of housing, and the view that this was often a function of increasing land prices, regulation and materials price increases. A composite measure that incorporates these factors to measure changes in new housing affordability were suggested.
- **Movement between jobs in the industry**: While worker turnover (movement into and out of construction) and job turnover (establishment and disestablishment of roles) rates exist, no known measure of how regularly workers move between jobs in the industry exists. This was suggested as something that could be measured, if a way could be found to record this information although no suggestions on measurement were made at the workshop.
- **Skills required as a function of dollars consented**: Participants suggested a project where the number of workers (by trade) required to carry out consented work could be estimated. However, they appreciated that the scale of this proposed indicator might preclude it from the dashboard. It would require an estimate of, for instance, the number of electricians required per X dollars of residential construction work. Then, when new consents data is released, an estimate of the number of electricians required could be made.

[3] Page, I; and Norman, D. (2014). *Measuring construction industry productivity and performance*. BRANZ.

4. FROM WORKSHOP TO DASHBOARD

Based on the discussion at the workshop and expressed preferences, the preferred measures for dashboard indicators (subject to data availability) were:

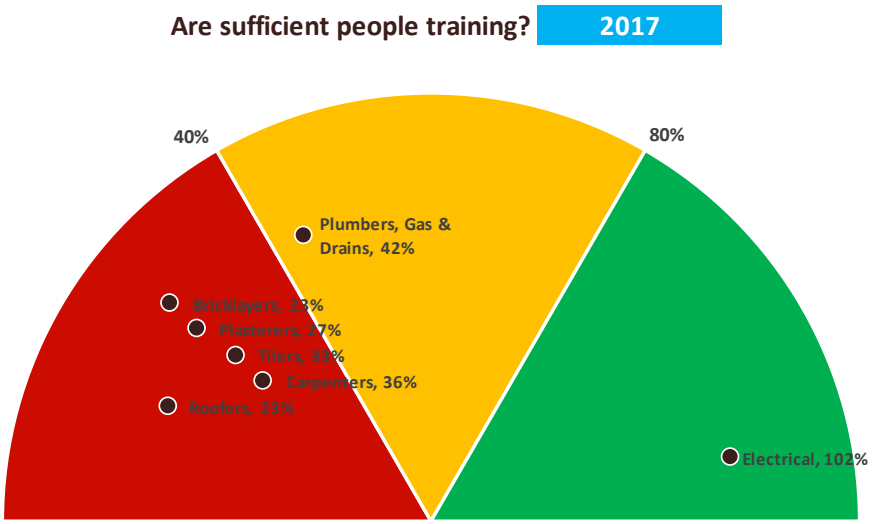
- Skills gap and training (using apprenticeship and labour demand forecasts provided by ITOs)
- Forecasts of expected construction activity for the next three to five years
- Customer satisfaction measures for the residential sector from the BRANZ New House Owners Satisfaction Survey.
- Injury rates for the industry
- Solvency or a similar measure of industry financial stability
- Input cost index (including land and building costs)
- An alternative efficiency or quality measure if available.

This section describes how BRANZ developed each measure from concept to the data set presented in the Dashboard.

4.1 Share of skills provided by training

Final measure: Expected number of apprentices and trainees completing study each year divided by the total expected demand for each skill category for that year.[4]

Figure 6 Dashboard example: Share of skills provided by training



4.1.1 Data sources

Apprentice and trainee starts and completions data were obtained from the Ministry of Education (MoE) for the purpose of estimating the skills gap and training needs of the industry. The authors of this study looked at the following occupations:

[4] Trainees are all those in industry training are not undertaking apprenticeship training (or who completed the historical Modern Apprenticeship training scheme). Typically trainee qualifications are at a level below the Level 4 apprenticeship qualification.

- **Bricklayers:** Blocklayers, Bricklayers and Concreters
- **Carpenters:** Carpenters and Project Builders
- **Electrical workers:** Electricians and Electrical Technicians
- **Plasterers:** Plasterboard-Stoppers, Fibrous Plasterers and General Plasterers
- **Plumbers, gasfitters and drainlayers:**
- **Roofers:** Roofing Professionals and Roof Tilers
- **Tilers:** Wall and Floor Tilers.

These broad categories were dictated by the data that ITOs and the MoE were able to provide. Using this data, it was possible to determine the **number of starts** and **how long it typically takes to complete** either an apprenticeship or training program for each of the occupations. BRANZ needed to estimate completions by year, but completion times for apprentices and trainees ranged from one year to nine years, so the number of training starts had to be **forecast**.

Infometrics completed a study estimating the number of people in each construction sub-industry required to replace retiring workers and augment the existing workforce to deal with rising demand out to 2017.[5] This study was used to estimate the total number of, for instance, electrical tradespeople needed per year on average out to 2017.

4.1.2 Forecasting starts

To estimate the number of starts, we looked for a relationship between the previously observed number of starts, consent values and work put in place (GFCF) for residential building. We used residential building because changes in the fortunes of the residential building sub-sector receive more regular media coverage. Therefore, people considering entering the industry were more likely to make career choices based on the strength of residential activity.

There was a strong relationship between the **total number of apprenticeship starts** for a calendar year and the value of residential consents issued in that calendar year (a correlation of 0.854). The strongest correlation between starts and GFCF occurred with a lag of three months for residential GFCF. For example, the 2005 calendar year apprenticeship starts were highly correlated with work completed between April 2005 and March 2006. This indicates that the consenting process is typically linked to starts in apprenticeships. In other words, builders take on apprentices when the pipeline is growing, such that training starts line up with consents granted, and precede work put in place by three months. Because GFCF numbers are measured in real terms, we use our **GFCF forecasts to help forecast total training starts** and completions for future years, rather than consents.

The number of apprenticeship starts is strongly linked to consents in the same period, and leads residential GFCF by three months.

The number of **trainee** starts (as opposed to apprenticeships) for a calendar year on the other hand had a weak relationship with work put in place. This suggests that trainees

[5] Infometrics. (2014). *Outlook for the construction industry: Part One: BETA monitoring report*.

make their decision to train in the industry independent of the level of building activity. On the other hand, employers are more willing to take on apprentices when their pipeline is growing.

BRANZ checked the relationship between the **number of starts** and work put in place in the **non-residential** sector and a combination of both the residential and non-residential sectors. However, the relationships were weaker than for residential building on its own.

To estimate the number of starts for trainees, BRANZ estimated the relationship between the total number of starts for both apprenticeships and trainees against the residential GFCF lagged one quarter. This gave a total number of starts. Subtracting the number of apprenticeship starts from this number gave an estimate of the number of starts for trainees. The approach is summarised in Figure 7.

Figure 7 Approach to estimating total starts

Future projections of Gross Fixed Capital Formation were used to estimate the number of starts. These projections come from BRANZ forecasts produced every six months.

4.1.3 Estimating completions

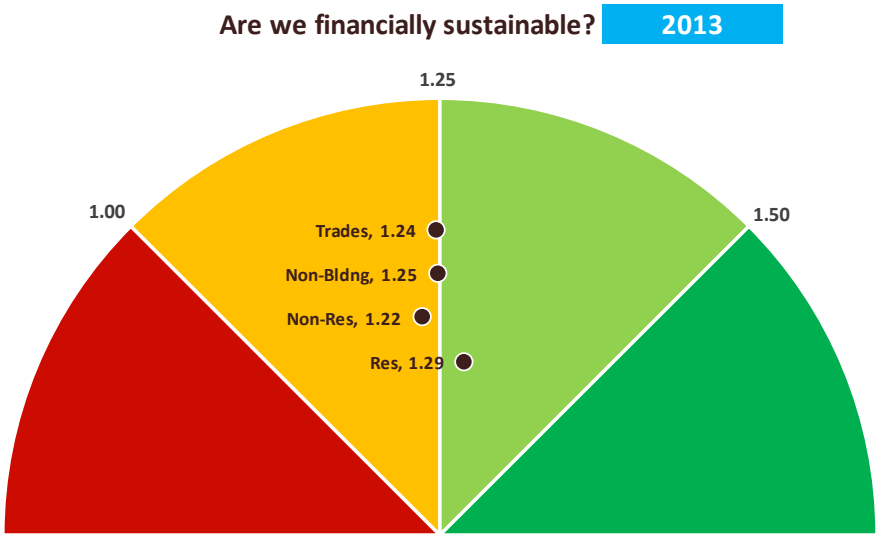
The first step in estimating the number of completions for each of the occupations was to forecast starts. With an estimate of the total number of starts (based on GFCF forecasts), it was possible to split the starts into the occupation categories. BRANZ used the historically observed split of total starts across occupations based on several years of data provided by MoE.

The next step was to use the previously observed percentage of starters in each occupation that complete in a given year to estimate the number of completions for each occupation by year. MoE was able to provide unit record data that identified how long each apprentice and trainee took to complete their apprenticeship/training. BRANZ used this data to break down the share of starters likely to complete in any given year. i.e. what share would complete after one year, two years and so on. This data provided an estimated number of completions for both apprentices and trainees by year.

4.2 Liquidity ratio: ability to service debt

Final measure: Liquidity ratio by sub-sector for the last four years.

Figure 8 Dashboard example: Liquidity ratio: ability to service debt



Liquidity is a basic measure of the extent to which a business (or industry) has sufficient current assets to meet its current liabilities. Statistics New Zealand publishes this data by sub-industry on an annual basis. The data includes four construction sub-industries:

- Residential construction
- Non-residential construction
- Heavy and civil engineering construction
- Construction services.

These ratios are presented for each of the last four years in the Dashboard.

4.3 New residential customer service

Final measure: Three measures of service compared to performance the previous year.

Figure 9 Dashboard example: New residential customer service

Are we improving satisfaction of new residential customers?		2013 Year on year
Overall level of service	↓ Worsened	-3.5%
Recommend builder?	↓ Worsened	-8.1%
Defect call-backs?	↓ Worsened	4.8%

This component of the Dashboard uses data from the annual BRANZ New House Owners' Satisfaction Survey, and compares the latest year's key survey results with results from the year before.[6] The three factors measured are:

- Overall level of service
- Likelihood of recommending builder
- Percentage of surveyed home owners who had to call back builders to fix defects.

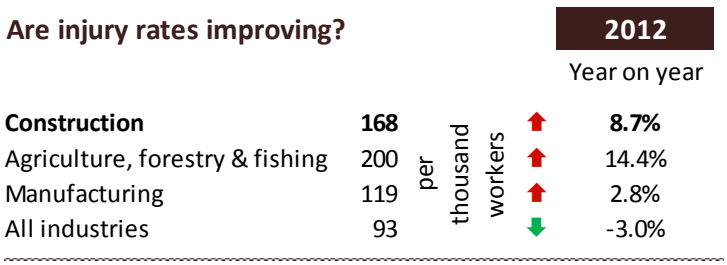
The latter two of these statistics come direct from the survey, while the first is an **average of** scores for the 10 questions on service and quality set out in the survey.

Simply looking at the scores for each of these factors is not particularly meaningful without a benchmark. Rather than present raw scores, the Dashboard compares the latest year's performance to the previous year. Scores are shown in **percentage point** changes. i.e. how has the overall score changed in percentage points. For instance, the proportion of respondents who would recommend their builder fell from 79.9% in 2012, to 71.8% in 2013, a decline of 8.1 percentage points.

4.4 Workplace injury rates

Final measure: Injury rates per 1,000 workers compared to other industries and to the previous year's performance.

Figure 10 Dashboard example: Workplace injury rates



The Accident Compensation Corporation (ACC) publishes annual workplace injuries data by industry that are reported by Statistics New Zealand.

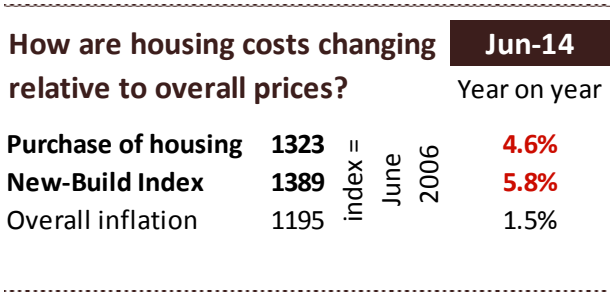
This component of the Dashboard compares injury rates per thousand workers for Construction; Agriculture, Forestry and Fishing; Manufacturing; and All industries. It also shows the percentage change in the injury rate over the previous year.

[6] Curtis, M; Norman, D; Page, I. (2014). *The New House Owners' Satisfaction Survey*.

4.5 Housing affordability

Final measure: The BRANZ New-Build Index, which compares changes in the cost to deliver a standard 200 m2 single storey house on a 500 m2 section.

Figure 11 Dashboard example: Housing affordability



BRANZ has developed a **New-Build Index (NBI)**. Before this, only affordability indices covering all **existing** housing stock were available. The BRANZ NBI has been included in the Dashboard, along with two Consumers Price Index (CPI) indices – Purchase of housing, and All groups inflation. This allows comparison of changes in the cost to build a **standardised new house**, the allowance in the CPI for the cost of new and existing housing, and overall consumer price increases.

4.5.1 The standardised housing package

The BRANZ NBI was developed by estimating the price to build a typical single storey 200 m^2 house on a 500 m^2 section in the March 2014 quarter. The Index consists of two components: the Land Price and the Build Price.

The **Land Price** uses quarterly Real Estate Institute of New Zealand (REINZ) weighted median section size and median section price data to estimate $/$m^2$. This value is then multiplied by 500 to estimate the price that could be expected to be paid for a 500m^2 section.

The **Build Price** assumes a flat section and allows (for the March 2014 quarter):

- $15,000 for landscaping
- $3,000 for a site scrape
- $10,000 for floor coverings (not included in a base case build quote)
- $10,000 for service connections
- $5,000 for Council fees.

For the **March 2014 quarter**, the Land Price was $114,448. The Build Price was $392,360, for a total New Housing Price of **$506,808**.

4.5.2 Conversion to Index

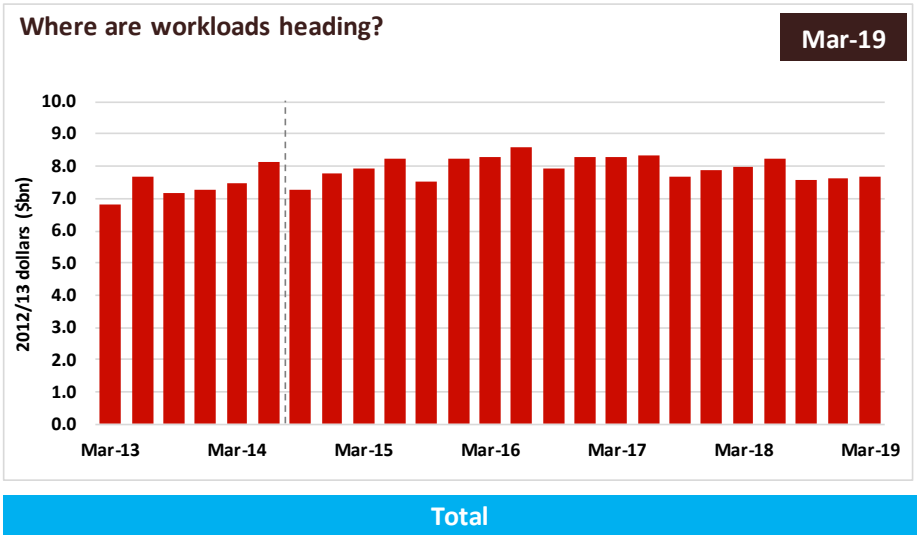
The Build Price was deflated using changes in the three-month average $/m^2 residential consent values for stand-alone houses quarter on quarter.[7] Land Prices were calculated as for March 2014 using REINZ monthly data back to 1999.

Summing the Land Price and Build Price in any given quarter gives the total New Housing Price. The June 2006 quarter was indexed at 1000, to allow direct comparison with the CPI, which is indexed in that quarter. For instance, the March 2014 quarter had an NBI value of 1348, or 34.8% higher than in the June 2006 quarter. This means the **overall cost** of delivering a 200 m2 house on a 500 m2 section rose 34.8% over eight years. Over the same time, the CPI rose only 19.5%.

4.6 Building activity forecasts

Final measure: Residential, non-residential and heavy construction GFCF forecasts by quarter for the next five years.

Figure 12 Dashboard example: Building activity forecasts



BRANZ produces forecasts for GFCF for the residential, non-residential, and heavy construction sub-sectors every six months. Forecasts for the next five years have been included in the Dashboard to provide a sense of where the industry is headed over the next several years. The GFCF forecasts are also used to forecast apprentice and trainee starts for the skills gap component of the Dashboard.

4.7 Changes in building quality

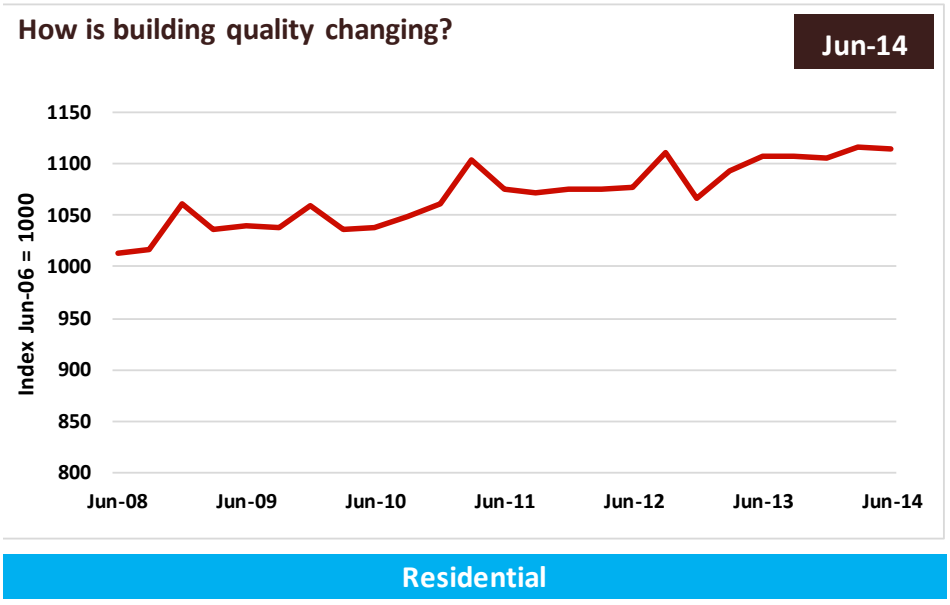
Final measure: An index of growth in the cost per m^2 to deliver housing over and above changes in the price of delivering that housing. i.e. a measure of changes in the quality of what is being delivered.

[7] The index is only for new detached housing. It does not include granny flats, other flats, apartments, or any other attached dwelling.

This indicator shows the **improvement in the quality of building** that is captured by official statistics. By quality, it mostly means changes such as the switch to double glazing and better insulation, or in customer preferences for say, granite counter-tops. In other words, many of the changes in $/m2 to build (once price inflation has been stripped out) relates to the styles, finishes, or ratings of products used.

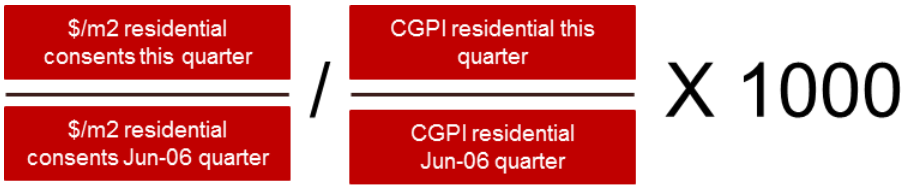
The measure divides changes in $/m2 consent value since June 2006 by changes in the Capital Goods Price Index since June 2006, before multiplying that result by 1,000. The equation used is set out in Figure 14.

Figure 13 Dashboard example: Changes in building quality



A value above 1,000 indicates that the quality of building has improved. For instance, the value for the June 2014 quarter for residential consents is 1114. This suggests quality has improved by 11.4% since June 2006, while $/m^2 have increased by 38.7%. This indicates that inflation has grown by 24.5% over the eight years.

Figure 14 Calculating quality changes using official measures



We also developed an index for non-residential building. However, this required us to weight the relative value of consents of different types of non-residential building types (such as hotels and farm buildings) and the results are therefore not as meaningful.

4.8 Where to from here?

The Dashboard will be updated quarterly for the duration of funding of the project (through to March 2016). Funding permitted, updates will continue beyond that date, providing an ongoing summary of where the industry is and where it is going.

5. APPENDIX A: FIRM-LEVEL KEY PERFORMANCE INDICATORS

Figure 15 Potential KPIs for measuring industry, sub-industry or firm-level performance

Measure name	How to measure this
Financial	
Solvency	Current assets / current liabilities; greater than 1.0 needed
Profitability	Gross, taxable or net profit / turnover
Return on Assets	Taxable or net profit / net assets
Revenue growth	% change in revenue over previous year
Profit growth	% change in profits over previous year
Economic value added	After tax operating profit - the cost of capital / turnover
Inventory turnover	Annual cost of goods sold / inventory on hand
Leverage test	All debts / all assets
Bad debts	% of turnover
Cost of defects	Hours required OR $ of labour costs OR cost as % of contract value
Customer	
Formal written feedback from client	Qualitative, basic survey questionnaire
Call back rate	% of jobs requiring a call-back
Market share	% of total sales in the region for this sub-sector
Time predictability across design and construction	Change in actual time / estimated time OR % of work delivered on time
Cost predictability of design and construction	Change in actual cost / estimated cost
Fixing of defects	Average days after practical completion to complete
Repeat clients	% of annual work value (or projects) that is repeat business
Social responsibility	Qualitative assessment
Internal business processes	
Business efficiency	General and administrative expenses as % of turnover
Degree of sub-contracting	Sub-contractor payments / turnover
Worker turnover rate or average tenure	Average years in job per worker, (joiners + leavers) / average staff level
Job turnover rate	Jobs disestablished / jobs filled at start of year
Brain drain	Skills analysis (average qualifications per worker)
Reportable accidents	Reportable accidents per 10,000 hours worked
Downtime	Actual hours worked across projects in a year / hours budgeted
New management tools / processes	Qualitative assessment of changes
Supply chain management	Qualitative assessment
Employee satisfaction	Qualitative assessment
Change orders	Number of individual change orders due to design or construction errors or adjustments
Leadership	How the executive team and other leaders support and promote a culture of business excellence
Strategy and planning	How management formulates, deploys, reviews and turns policy and strategy into plans and actions
Resources and information management	How the firm manages and uses resources and information effectively and efficiently
Impact on society	What the firm achieves in satisfying its local community and society
Inventory management	Lag between buying materials and being reimbursed by client (absolute value)
Change management	Qualitative assessment
Quality measurement	Use defects measures as proxies
Cost reduction	Cost per unit of work (e.g. per square metre of housing put in place)
Proportion of tenders / quotes that are successful	% of quotes accepted (by volume and dollars)
Share of turnover from competitive tenders / quotes	% of work from tenders / quotes rather than direct appointments
Marketing focus	% expenditure as a % of turnover
Supplier (sub-contractor) performance	
Learning and growth	
Innovation / R&D spend	% of turnover OR spend per worker
Prefabrication	% of value of work put in place
Investment in training	% of turnover OR % of workers receiving training
Technological capability	Value of Intellectual property rights , measured as patents, industrial design rights, and copyrights - could use "Intangibles" as a proxy
Investment in equipment and technology	% of turnover
HR development	% of staff receiving formal training each year