Queensland Business Innovation Report 2012

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1 DEFINITIONS

Collaboration
Firms that collaborated had engaged in formal or informal collaborative or partnership arrangements with other organisations in the last three years.

Competitive advantage
The strategic advantage one business entity has over its rival entities within its competitive industry. Achieving competitive advantage strengthens and positions a business better within the business environment.

Engagement
When ‘engagement’ is used in this report, it is a binary variable (yes/no) that is calculated from other variables to indicate whether a firm reported any activities of a particular type. This can refer to engagement in research and development (R&D) or collaboration.

Firm size categories
1-4 FTEs – Micro firms
5-19 FTEs – Small firms
20-199 FTEs – Medium sized firms
200+ FTEs – Large firms

FTE
Full Time Equivalent is a unit that indicates the workload of an employed person.

Industries
Are based on 2006 Australian and New Zealand Industry Classifications (ANZIC).

Innovation type
- Technologically new or significantly improved manufactured product
- Technologically new or significantly improved methods of producing manufactured product
- Technological improvements in supply, storage or distribution systems for manufactured product
- New or significantly improved service product
- New method to produce and deliver service product
- New organisational/managerial processes or marketing methods

Innovation
Firms were asked to consider innovation as occurring when any of the innovation types were introduced to the market. These improvements involved more than aesthetic changes or mere product differentiation.

Multifactor productivity
Represents the growth in output that cannot be attributed to either labour or capital input. It refers to the contribution of technology, advances in knowledge, improvements in management, or production techniques towards output growth.

Non-innovators
Non-innovators reported no innovation in any of the six product, service or process innovation types.

Non-novel innovators
Non-novel innovators reported at least one type of product, service or process innovation that was only new to the firm, and not to the industry.

Novel innovators
Novel innovators reported at least one type of product, service or process innovation that was new to the industry.

Panel data
Information derived from firms that were involved in both the 2011 and 2012 Queensland Business Innovation Surveys. These data are not weighted because they are from the same firms and can only show changes over time, not levels.

Profitability
The degree to which a firm achieves financial gain.

Research and development (R&D)
The systematic investigation or experimentation involving innovation or technical risk, the outcome of which is new knowledge or improved products, processes, materials, devices or services. R&D activity extends to modifications to existing products/processes.

Significant difference
A result is deemed statistically significant if it is unlikely to have occurred by chance. As used in statistics, significant does not mean important or meaningful.

Sources of innovation
The origin of ideas or information for a firm’s innovation activities.

Tourist
A person travelling to a place other than his/her usual place of residence for less than twelve months for the purpose of leisure, recreation and holiday purposes or visiting friends and relatives.

Types of government support
- Self-help diagnostic and benchmarking tools
- Business skills, capacity development: workshops, forums, seminars
- Specialist business mentoring or coaching
- Business opportunity development, e.g. export services
- Connecting businesses, e.g. networking, R&D and investment
- Grants/financial incentives

Weighted data
Data collected from survey respondents are adjusted to represent the population from which the sample was drawn.
2 EXECUTIVE SUMMARY

The Queensland Business Innovation Report highlights how Queensland firms are responding to the adverse circumstances they have been facing since 2008. While the first report included evidence of the tail end of a long period of economic stability and growth (from the three year data on which it reported), this year the three year data reveal a period of decline. During the period upon which respondents were asked to reflect, the full effects of the global financial crisis, Queensland floods, cyclone Yasi and a changing business environment are noticeable. This effect is more pronounced in the one year data.

The full effect of several environmental shocks are starting to affect the way that many firms do business.

This report provides a snapshot of how firms are responding to the changing structural conditions in the economy. From the qualitative responses gathered during the research, the changes that are felt most profoundly include shrinking markets due to changing spending habits, an unfavourable exchange rate for exporters, competitively priced imports, and the rise of online shopping. These responses, taken together with other information that includes the competitive environment and barriers to achieving business objectives, shows that firms are struggling to cope with these changes, and that the effects of several economic and other environmental shocks, as noted above, are starting to affect the way that many firms do business.

While new and young firms are generally viewed as important for innovation, this report underscores the role of medium and large firms in sustaining innovation during economic downturns. Small firms may improve their situation by using various forms of collaboration, as results confirm that collaboration is important in sustaining innovation during adverse conditions.

Action on innovation must be a priority for emerging from this crisis (OECD, 2010, p. 10)

An important strength of this research is that it provides evidence about how and why firms innovate, as well as the impact of that innovation. A significant finding was that 56 per cent of Queensland firms innovated over the last three years compared with 53 per cent for the rest of Australia. It is hoped that the statistical information provided can be used to support decision making and policy development by governments as well as the business community.

Figure 2-1 captures the highlights from this report.
### Figure 2-1 Highlights

#### Innovation levels
- 56% of Queensland firms innovated over the last 3 years compared with 53% for the rest of Australia.
- 18% of Queensland firms were novel and 9% non-novel innovators over a one year period.

#### Business practices
- Queensland novel innovators employed more managerial and technological staff and were more likely to provide formal training than other firms.
- Innovative firms were more likely to be engaged in R&D, offer training, have a business plan and manage their accounts on a monthly basis.
- Price and speed of service were the most important sources of competitive advantage to Queensland firms.

#### Collaboration
- Firms that collaborated in 2011 had higher levels of innovation in 2012.
- Collaboration rates for both Queensland and Australian firms were 29%.
- Queensland firms were most likely to collaborate with firms in their line of business, followed by suppliers and customers.

#### Areas in which firms innovate
- More Queensland firms used different types of process innovation (22%) than product or service innovation (18%) over a one year period.
- Panel data indicated that service innovation declined most (14 percentage points), followed by product production, service operations, logistics, managerial process and product innovation.

#### R&D and IP
- Over a one year period, 17% of Queensland firms engaged in R&D compared to 19% for the rest of Australia.
- Manufacturing firms were more likely to engage in R&D followed by electricity and water services and communication services.
- The majority of Australian and Queensland firms used confidentiality agreements, as compared to copyright, trademarks and patents.

#### Barriers to business objectives
- The most significant barrier to business objectives for both Queensland and other Australian firms were government regulations and compliance.
- Queensland firms also rated a lack of skilled labour and limited availability of finance or cost of finance for expansion as important barriers.

#### Investment
- 65% of Queensland firms did not seek any additional finance.
- Almost two thirds of the Queensland firms that sought finance were unsuccessful.
- Larger firms were more likely to be successful at obtaining finance.

#### Government support
- Queensland firms were more aware of and more likely to access business skills and capability development programs than other programs.
- Queensland firms in the Northern region were much more likely to be aware of programs and actually access them across most programs.

#### International sales
- Innovators reported higher levels of exports.
- Approximately 25% of Queensland and 23% of other Australian firms reported international sales.

#### Longitudinal analysis (panel data)
- The panel data show that while non-novel innovation, as measured over the last three years, remained stable between 2011 and 2012, there was a decline in novel innovation of 11 percentage points for all Australian firms. Only 44% of R&D active firms in 2011 remained R&D active in 2012.
- Firms with high growth intentions in 2011 reported 15 percentage points higher R&D levels in 2012, and those with moderate growth intentions seven percentage points higher than the average.
- R&D engagement in 2011 had an important impact on novel innovation in 2012, with almost 2.5 times more novel innovators engaging in R&D than non-novel innovators.
- Novel innovators in 2011 were more likely to have substantial growth intentions in 2012.
- Novel innovators in 2011 were also more likely to keep on engaging in R&D in 2012 – nine percentage points higher than the average.
2.1 Innovation levels

This research followed the approach advocated by the Oslo Manual (OECD, 2006) and Centre for Business Research (CBR) at Cambridge University, which used a three year time period to understand changes in business innovation levels. Since innovation is a time consuming process that is seldom completed within one financial year, this approach tends to provide a more accurate picture of innovation activity at the firm level. Approximately 56 per cent of Queensland firms and 53 per cent of Australian firms reported some form of innovation over the three years preceding March/April 2012. A comparison with the three year innovation levels reported in 2011 shows a decline. For Queensland firms the decline was five per cent, and for other Australian firms nine per cent. There were profound differences in these levels among different sized firms and those from different industries, as explained in Section 2.2.

To understand the nature of the decline it also helps to look at the innovation levels reported over the last year, which show a much more profound drop during this time. It is thus very plausible that the decline has been caused by a lack in innovation investment over the last year due to low levels of business confidence. This finding confirms the trend seen in the recently released Australian Bureau of Statistics’ (ABS) data, which saw a similar drop in one year innovation levels from 2010 to 2011 (see Table 3-7 in the Technical Appendix).

Analysis of data from firms that replied to surveys in both 2011 and 2012 (panel data) explains the nature of the decline in more detail. These firms did not report a drop in levels for non-novel innovation, with the change in innovation almost solely explained by an 11 percentage point reduction in novel or new to the industry innovation. These changes were further confirmed by the number of firms that reported research and development (R&D) activity (which can lead to novel innovation), as this also dropped by 15 percentage points from 2011. R&D is an investment decision that is not part of the innovation strategy of all firms, but it is particularly important for firms in for example high-technology industries. R&D investment does, in aggregate, translate into more innovation. This is supported with analysis of the panel data, which confirmed that firms that intended to grow and invest in R&D in 2011 were much more likely to reap benefits through novel innovation in 2012.

Because innovation is essentially an investment decision, low levels of business confidence are causing falls in innovation

A likely explanation of these changes can be found in business conditions and resulting business confidence over the past few years. Until the recent global economic downturn and Australia’s natural disasters, Australia enjoyed an unprecedented run of prosperity and firms became “normalised” to these conditions. This led to a high level of business confidence and business investment. Now however, business confidence in Australia is in a trough and because innovation is fundamentally a business investment decision (Nelson & Winter, 1977), low levels of business confidence are likely causing falls in innovation. The results of the survey correspond to this pattern of falling innovation activity in difficult business conditions. These arguments are confirmed by a survey of Australian CEOs, conducted by KPMG in April 2012.
This close relationship between business confidence and innovation can be seen from the Australian business confidence data, as summarised by the OECD (see Figure 2-2). This figure illustrates percentage changes in gross domestic product (GDP), the business confidence index (BCI), multifactor productivity (MFP) and ABS innovation levels (based on the ‘innovating businesses’ category in the ABS data). It demonstrates that business confidence in Australian firms is now as low as it was during the period following the Lehman brothers collapse in 2008. The figure illustrates that changes in business confidence are followed by similar, albeit more profound, changes in innovation levels. Innovation levels and GDP tend to vary closer together, but changes in these are followed by changes in MFP. These recession-like conditions would therefore represent a significant shock for investment decisions, including innovation, which explains the Australian wide drop in innovation.

The trend is also visible in the longer term ABS innovation data series in Figure 2-2. While one year innovation data is volatile as is evident from this graph, the effects of the 2001 “dotcom” recession, the global financial crisis and the more recent sovereign debt crisis are clearly evident. Considering that innovation investments were most likely put on hold in 2009, resulting in a gap in the pipeline for longer-term projects and then again in 2011-2012, the drop evident in this report seems very plausible. The latest ABS result

In a survey of 546 Australian firms conducted in April 2012 by KPMG, the findings of this research were echoed. Firms reported that they were apprehensive about the future. They believed that the economic cycle in Australia was in a downturn, with 46 per cent reporting poor or very poor short term business projects. This sentiment was based on the uncertainty in Europe and elsewhere, the high Australian dollar, declining housing prices and construction, and flat retail spending. As a result, firms are scaling back on growth plans and capital spending.

KPMG Private Companies Survey 2012
reports to the end of the 2011 financial year, and the figure in this report shows a further deterioration in business confidence after that point.

2.2 Innovation differences among firm types

Innovation and R&D activities were not the same for all firms. For example, smaller firms were less likely to innovate than their larger counterparts, whether measured through activity over the last one or the last three years. Medium and larger sized firms were approximately twice as likely to introduce innovations that were novel. Larger firms tend to have broader capabilities and more resources to support innovation. This result is supported by several past studies, including the 2011 Queensland Business Innovation Survey. It is these capabilities and resources that make larger firms more resilient under adverse conditions. The fluctuation in innovation in small firms can be understood against much of the analysis presented in this document. For example, small firms had lower growth intentions, and these intentions dropped significantly from 2011 to 2012. They also were less likely to invest in R&D or seek finance to grow their businesses.

This is a story about experience that can also be linked to the findings in other parts of this report about responding to business challenges. Experienced business owners who recognise opportunities and challenges are more likely to innovate. What is more, these business decisions can probably be made faster in a medium sized firm. In a tough operating environment, business success is the combination of experience and agility, which means that medium sized firms are best placed to maintain innovation.

In a tough operating environment, business success is the combination of experience and agility.

A comparison by industry and industry sector showed that the manufacturing, mining and communications industries performed best at innovation, which continued their status from 2011. Business confidence surveys show high levels of confidence in most of the innovative sectors. Two industries buck the trend; manufacturing and tourism, which are both trade exposed sectors. The pain in these sectors, caused by the strong dollar, changes in consumer spending patterns and weak investment markets affecting the finance sector are having a negative effect on confidence and in turn upon investment. Nevertheless, the innovation performance of these industries was above average, even though both experienced a downturn in innovation over the last year.

In terms of Queensland regions, firms from the South East reported the highest R&D levels, followed by Northern region firms. This is similar to the business confidence survey (OECD, 2012) that reported falling confidence in the regions despite the mining boom and the improved farming conditions.

2.3 Collaboration

The report also details a number of collaborative behaviours. First, the sources of ideas for innovation were investigated. Most firms used internal sources, but those that tended to look outside their firms were more likely to focus on firms in their supply chain. Second and more broadly, firms also tended to collaborate with others in their supply chain for purposes other than innovation. The 29 per cent of Queensland and other Australian firms that reported external collaboration cited reasons such as: expanding the range of products and services, and targeting and satisfying the needs of customers more closely.
Importantly, analysis of the panel data shows that collaborative behaviours were important to sustain innovation efforts, with collaborators less likely to stop innovating during adverse economic conditions. Innovators were also more likely to use collaboration for purposes that could improve their innovative efforts. In a paper that uses ABS data to further illuminate the relationship between collaboration and innovation (Grönum, Verreynne, & Kastelle, 2012), this focused form of collaboration or networking is identified as important for firm performance. The findings of this report support that assertion and identify reputation, product development, access to ideas and/or overseas markets, and access to grants as most important in this regard.

2.4 Drivers of innovation

To understand why firms innovate, the drivers of innovation were examined with a focus on strategic planning mechanisms, skills and training, growth intentions and competition. Innovating Queensland firms were more likely to use planning mechanisms, including written business and human resources plans and innovation strategies. They were also more likely to have formal communications, such as a website for trading. Analysis of panel data confirmed these trends, with firms innovating in 2012 more likely to engage in R&D, have a business plan and manage their accounts on a monthly basis in 2011. Formalisation (the extent to which work roles are structured in an organisation) through planning and other managerial practices has been shown in other studies to support the ability to innovate and Cosh, Fu and Hughes (2012) argue that this is superior to other firm structures. They do warn, however, that formalisation should ideally be coupled with participation in decision making, and also that it may not be relevant in, for example high technology sectors.

Innovative firms have more formalised practices, but also encourage employee participation

From the analysis it is clear that the skills base of innovators differed from other firms. These firms employed more managerial staff and technologists than general operating staff, in comparison with non-innovating firms. They were also more likely to provide formal training to staff. This finding supports previous research results that identify an emphasis on managerial and technological staff as crucial to supporting innovation (e.g. Souitaris, 2002). Firms that innovated more often reported that they either intended to grow substantially or moderately. Further analysis also showed that firms that are satisfied with their overall performance are less likely to innovate. This tells a story about entrepreneurial culture and growth ambitions. An aspirational firm operating in the same environment as a satisfied firm may perceive more barriers to growth but also be more innovative. These firms did not shy away from competition. Innovative firms almost never had no competitors, and were more likely to have many competitors.

Further analysis of the effect of growth intentions and R&D engagement on novel innovation on the Australian panel data can be interpreted to also support the earlier argument that novel innovation is a deliberate investment decision that firms undertake when they want to grow their business. When business confidence is lower, such decisions are put on hold to mitigate perceive risks in the business environment. Since risk is inherent in innovation, innovation is therefore put on hold until business conditions and therefore business confidence improves.
2.5 **Barriers to innovation**

Firms were asked to report the most significant barriers to achieving business objectives. Results highlight government regulations and compliance as being at the forefront of managers’ minds from all over Australia. From the open ended responses to a question on barriers, it appears that green tape and red tape were of equal importance here. Other barriers that were important to Queensland firms were access to skilled labour and availability and cost of finance and increasing competition. Responses to the open ended question indicated differences between innovators and non-innovators. Queensland innovators were concerned with possible future impacts of changes in their business environment. Non-innovators were focused on the market, and concerned with issues such as demand and exports. The responses highlighted that low regulatory barriers are important to ensure that growth firms invest in innovation, rather than in dealing with green or red tape.

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*Firms innovate to gain competitive advantage by differentiating their offerings from others in the market*

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To explore the issues around financing in more depth, an analysis of firms that attempted to find finance was conducted. Most firms reported the use of bank finance or hire purchases, followed by family loans. Nearly 60 per cent of Queensland firms that sought finance were unsuccessful and most of those employed fewer than 20 FTEs. These findings were not unexpected, with difficulties accessing finance for small firms reported widely.

It is noteworthy that novel innovators tended to rate barriers lower than other firms. This fits with theoretical arguments (e.g. Freel, 2005; Zahra, 1995) that firms react to perceived uncertainty in the environment with innovative behaviours. Innovation therefore becomes a mechanism to deal with challenges strategically. For Queensland firms, certain obstacles were more likely to elicit innovation, such as availability and cost of overdraft finance; lack of management and marketing skills; problems with accessing overseas markets; low market demand; and increasing competition.

2.6 **Government support**

Queensland firms reported on how they use government support. The most popular type of support was business skills and capacity development programs, followed by self-help options. Regional firms were more likely to use government support. Innovators were more likely to report the use of business opportunity development programs, which points to the success of this type of service offering. It is also noteworthy that firms that responded in both years reported a much higher awareness of grant and financial incentive programs in 2012.

2.7 **Patterns in the panel data**

The preceding sections identified a number of changes that were observed in the panel data, and that provide a better understanding of how firms are changing their practices on a year-to-year basis. Figure 2-3 presents an index created from these data. It compares the practices of panel firms in 2011 with their innovation level in 2012. The data indicate that novel innovators were more likely to engage in R&D, have moderate or substantial growth intentions and be novel innovators in 2011. These findings summarise the results presented in Section 9 and confirm that firms that engage in novel innovation
will sustain that way of doing business over time. Therefore, while novel innovators may redirect resources to more pressing issues during periods of uncertainty, they are unlikely to stop innovating over the long-term.

**Figure 2-3 2011 Practices by innovation level 2012**

Closer examination of Figure 2-3 further explains the decline in innovation over the last year. For example, it shows that while novel innovators in 2011 made up the bulk of novel innovators in 2012, a large proportion of the novel innovators have also put innovation on hold, with a third each reporting no innovation or non-novel innovation during 2012. Similar examination of R&D engagement shows that of those firms that were R&D active during 2011, 40 per cent introduced novel innovations in 2012, but almost as many were non-novel innovators and more than 20 per cent became non-innovators. Further, while those with substantial growth intentions in 2011 were much more likely to be novel innovators in 2012, there were almost 60 per cent of firms that were not. These patterns are important to explain just how volatile innovation levels are on a year to year basis. Even though the general trend may still be towards innovation, and in particular novel innovation, small changes in how for example firms invest in R&D, can result in a fairly large change in innovation levels.
3 INTRODUCTION

The role of innovation in economic and social well-being is well established (Baldwin & Gellatly, 2003; OECD, 2009). Innovation surveys are used across the globe to measure the level of innovation activities of countries and regions. The data generated by these surveys provide a better understanding of why and how firms innovate, thereby improving policy and decision-making by governments and business alike.

This report covers key indicators that describe the activities and patterns of Australian, and in particular Queensland, businesses. A broad view of innovation is taken. Innovation includes not only scientific research and development (R&D) and product or service innovation, but also novelty and change in the ways that firms work.

The 2012 Queensland Business Innovation Survey uses the methodology developed at the Centre of Business Research at Cambridge University. A detailed survey was distributed to 13,100 firms by survey and an additional 1,002 firms from an existing business panel. A total of 1,710 firms completed the survey, for an overall response rate of 12 per cent and 15 per cent for Queensland firms. This report describes the innovation performance of the 1,555 Australian (including 603 Queensland firms) that remained in the database after it was weighted according to industry, state and firm size. Weighting was applied to data to limit response bias, meaning that responses from firms of different sizes, industries and states were weighted in proportion to their actual presence in the general population of Australian firms. Queensland data was further broken down into four regions; Northern, Central, Southern and the South East (see Figure 3-1).

![Figure 3-1 Queensland regions](image)

Importantly, also included in the data are responses from the 407 firms from across Australia that responded to last year’s as well as this year’s survey (termed panel data). The data are especially rich; giving valuable insights into how the business practices and
processes from last year relate to innovation this year. The panel data are presented in Section 9 of this report.

The focus of the analysis is on the different types of innovation that firms undertake. The types of innovation include product and service, as well as different types of process innovation. These types are divided into categories that are novel (new to the industry) and non-novel (new to the firm). The sources of innovation, barriers faced by firms and a number of other business practices are also described. These practices are compared across size groups, industries, and Queensland regions.

The report has been divided into two documents, this report and a separate technical appendix. To interpret the technical parts of this document it is important to note that:

• Data were gathered for the three year and one year periods preceding March/April 2012.
• Because panel data are generated from known firms, it is used to follow the incremental development of the innovation process. No weighting was applied to the panel data as the same firms were being compared. Therefore, the data are best used to provide greater insight into the data shown by various innovation indicators over time, rather than to establish benchmark levels year-on-year.
• Analysis in this document refers to Queensland firms, unless specifically stated otherwise.
• In general, percentages in tables and figures add up to 100 per cent. However, due to rounding there are instances where this does not happen. In addition, where respondents could choose more than one category in a particular question, it cannot add up to 100 per cent. This report should be read in conjunction with the Technical Appendix that contains the methodological context and the analysed data used for this report.
• Further technical conventions are described in more detail in the Technical Appendix.
4 INNOVATION IN QUEENSLAND FIRMS

This section provides an overview of the firms that responded to the survey (Sections 4.1 to 4.3). The responses to these sections were compared to ABS data and used to inform whether the data should be weighted (for full explanation, see technical appendix). From Sections 4.4 onwards, the results draw upon weighted data.

4.1 Firm size

The size distribution of the 603 Queensland firms included in the analysis closely mirrors the distribution of the actual population of firms as reported by the ABS (see Figure 4-1). The majority of respondents (62 per cent) employed between one and four FTEs (full time equivalent employees) and were classified as micro firms, 27 per cent between five and 19 employees (small firms), 10 per cent employed between 20 and 199 FTEs (medium firms), and the remaining one per cent 200 FTEs or more (large firms).

The size distribution of firms for Queensland regions was very similar. However, as shown in Figure 4-2, the proportion of small firms from the Northern and Southern regions was greater than the Central and South-East regions, and these regions also had no responses from firms employing 200 or more FTEs.

Figure 4-1 Firm size of Queensland firms (unweighted)

Figure 4-2 Regional distribution of Queensland firms (unweighted)
While the Queensland size distribution was in line with the general Australian respondents, the size distribution of the 1,710 Australian firms that responded was somewhat different. To deal with such differences, data were weighted for all data analysis (see Technical Appendix). Figure 4-3 shows that approximately 55 per cent of respondents employed one to four FTEs, 26 per cent five to 19 FTEs, 15 per cent 20-199 FTEs and the remaining three per cent 200 or more FTEs.

![Figure 4-3 Firm size of all Australian firms in the sample (unweighted)](image)

### 4.2 Firm age

The average age of all Australian firms was 18.35 years and that of Queensland firms slightly higher at 18.89 years. When investigating the age distribution by Queensland region, it was evident that firms from the Central and Northern regions were older (22.76 and 26.33 years respectively) than those from the Southern and South Eastern regions (17.92 and 17.56 years respectively).

### 4.3 Industry

![Figure 4-4 Industry responses by location (unweighted)](image)
Figure 4-4 provides an overview of the actual responses received, based on the industries indicated by respondents. The majority of firms from both Queensland and the rest of Australia were from service related industries. Wholesalers and retailers made up approximately 26 per cent of Queensland responses, but just 19 per cent of Australian responses. This was followed by construction, finance, agriculture and manufacturing in both samples.

4.4 Firm location

Similar to the general population, most of the Queensland respondents were from the South East (71 per cent), followed by the Northern (10 per cent), Southern (10 per cent) and Central regions (nine per cent).

4.5 Innovation levels

Innovating firms were divided into novel and non-novel innovators, where novel innovations are new to the firm and industry, and non-novel innovations are new to the firm but not to the industry. The remaining firms were classified as non-innovators (see technical report for full explanation). From the three year data it was clear that environmental conditions had an adverse effect on innovation (see Figure 4-6). Fifty-six per cent of Queensland firms (down from 61 per cent in 2011) and 53 per cent of other Australian firms (down from 62 per cent in 2011) innovated over a three year period. This drop was also evident from firms in the panel.
Analysis of the one year data shows that this drop was due to changes in innovation practices over the past year. In Queensland, 27 per cent of firms engaged in innovation, 18 per cent in novel and nine per cent in non-novel innovation (see Figure 4-7). In Australia this number was only slightly higher at 28 per cent (not a statistically significant variation). Firms that formed part of the panel were slightly more aware of innovation than other firms, and 29 per cent reported involvement in innovation. Since these firms were exposed to the notion of innovation before, this result was not unexpected. Reviewing the rest of Australia, excluding Queensland, shows similar trends to the overall Australian data.

More Queensland firms used process innovation (22 per cent) than product or service innovation (18 per cent). These numbers again corresponded closely with the rest of Australia (see Figure 4-8).

4.6 Innovation by firm size
The firm size of different categories of innovators was compared to the rest of Australian firms (see Figure 4-9). Medium and large sized firms had to be collapsed into one to improve comparison. The general trend that was observed last year, where novel innovation increased with firm size, was again evident this year for all firms.

Figure 4-9 Firm size by innovation level (1 year weighted)

### 4.7 Source of innovation

The sources of innovation used by Queensland firms were analysed. The most important source of ideas was from within the firm (51 per cent), followed by customers (48 per cent) and suppliers (38 per cent). The first three sources were the same as in 2011, with only minor changes in the importance of subsequent sources of ideas.

Figure 4-10 Sources of innovation in Queensland (weighted)
5 INNOVATION ACROSS INDUSTRY SECTORS

To ascertain the proportion of Queensland firms involved in the tourism sector, firms were asked to provide the percentage of their revenue that was derived from expenditure by tourists. All firms that reported five per cent and above were classified as part of the tourism sector, with the exception of those firms already classified as resources, agriculture or construction. The resources sector included mining and electricity, gas, water and waste services. Approximately five per cent of respondents were from resources sectors, just under 20 per cent were categorised as tourism firms, eight per cent as agricultural firms and 12 per cent as construction firms.

In Queensland, resources firms were most likely to innovate (approximately 42 per cent); followed by tourism (27 per cent), construction (26 per cent) and agriculture (22 per cent). These differences were not statistically significant (See Figure 5-1). To allow for useful reporting of industries with small numbers, the data for this comparison were not weighted.

**Figure 5-1 Innovation by sector (Queensland 1 year unweighted, mining all firms)**

In general, firms from the rest of Australia reported slightly more innovation activity than Queensland firms for each of the industry sectors. Closer scrutiny of the data revealed that the firms that responded from Queensland tended to be smaller, and since large firms tend to report more innovation (see earlier discussion), this anomaly affected the Queensland innovation levels.
A comparison of innovators versus non-innovators across a broader selection of Queensland industries provided some noteworthy results (see Figure 5-2). Consistent with the result in 2011, Manufacturing, Mining and Communication services were the most innovative sectors. These were followed closely this year by wholesale, retail and accommodation. While a small number of responses were received from electricity and water services, they reported a high level of innovative firms. It is worth noting that mining firms with operations in Queensland were included in this and the previous analysis, even if their head-quarters were located outside Queensland.

**Figure 5-2 Industry by innovation level (Queensland 1 year weighted)**

- Agriculture, forestry and fishing
- Mining (all Australia)
- Electricity and water services
- Manufacturing
- Construction
- Wholesale, retail, trade & accommodation
- Transport and storage
- Communication services
- Manufacturing
- Finance, insurance and property
- Other

Legend:
- Non-innovator
- Non-novel innovator
- Novel innovator
6 INNOVATION FUNDAMENTALS

6.1 R&D

The results of the responses to the R&D questions mirrored the innovation data. In Queensland 17 per cent of respondents reported that their firms engaged in R&D, either through monetary spending and/or dedicated staff. Australian firms reported a slightly higher engagement of 19 per cent. Similar to the overall innovation numbers, these numbers were lower than in 2011. This comparison is expanded in Section 9.

Figure 6-1 compares R&D for different sized firms. Statistically significant differences were found for R&D by firm size for both the Queensland and rest of Australia samples. In line with previous studies, larger firms were more likely to engage in R&D than smaller firms.

A comparison of R&D engagement between industries (see Figure 6-2) revealed that manufacturing firms were more likely to engage in R&D (34 per cent for Queensland firms), followed by electricity and water services (30 per cent) and communication services (21 per cent). There was a statistically significant difference in R&D engagement between industries for both the Queensland and the rest of Australian samples. One of the five mining firms identified as from Queensland did engage in R&D (20 per cent), however, due to weighting, the weighted data show that mining firms in Queensland are not engaging in R&D.

A comparison of R&D engagement between industries (see Figure 6-2) revealed that manufacturing firms were more likely to engage in R&D (34 per cent for Queensland firms), followed by electricity and water services (30 per cent) and communication services (21 per cent). There was a statistically significant difference in R&D engagement between industries for both the Queensland and the rest of Australian samples. One of the five mining firms identified as from Queensland did engage in R&D (20 per cent), however, due to weighting, the weighted data show that mining firms in Queensland are not engaging in R&D.

Figure 6-2 R&D engagement by industry (Queensland 1 year weighted)
Figure 6-3 compares R&D engagement across Queensland regions. It shows that firms from the South-East region were more likely to engage in R&D (19 per cent), followed by the Northern region (14 per cent) and the Central and Southern regions (eight per cent). However, these differences were not statistically significant due to the small sample size.

![Figure 6-3 R&D engagement by region (Queensland 1 year weighted)](image.png)

### 6.2 Collaboration

Firms were asked if they engaged in collaborative or partnership arrangements during the last three years. The rate of engagement for both Queensland and Australian firms was 29 per cent. Queensland firms were most likely to collaborate with firms in their line of business (competitors), with 19 per cent of collaborating firms reporting that they had partnered with a competitor (see Figure 6-4). This was followed by suppliers (14 per cent) and customers (13 per cent). Queensland and Australian firms showed similar patterns of collaboration. This high rate of supply chain collaboration is similar to the sources of ideas used by firms, and replicates the results from the 2011 survey. When reading this figure, note that each line is drawn from a separate analysis and should not be summed.

![Figure 6-4 Type of collaboration (Queensland 1 year weighted)](image.png)
Figure 6-5 reveals why firms collaborated. Again similar patterns existed for Queensland and other Australian firms. The most cited reason by Queensland firms was to expand the range of expertise or products/services (76 per cent), followed by assisting in the development of products/services to satisfy customer needs (64 per cent) and to help keep current customers (61 per cent). The most important motivations were therefore closely related to innovation activities.

Queensland innovators were compared to non-innovators. Statistical significant differences show that innovators were more likely to collaborate with external stakeholders than non-innovators.

Further analysis of the purpose of collaboration for innovators, revealed a number of statistical significant differences (see Figure 6-6). For example, innovators were more likely to use collaboration to improve financial and market credibility, assist in the development of specialist services/products required by customers, gain access to or spread costs of new offerings, help to keep current customers, provide access to overseas markets, and access grants requiring collaborative arrangements. The areas where innovators were more likely to concentrate their efforts were generally innovation related, and thus they used collaboration to support their innovation endeavors.
6.3 Skills & training

Figure 6-7 illustrates the occupation groups employed by innovators versus non-innovators. Different categories of innovators hired different percentages of managerial and technology staff. For example, novel innovators employed more managerial and technological staff than other firms, with non-innovators employing the fewest of these types of staff.
This finding was replicated in the levels of formal training reported by different categories of innovating firms. Novel innovators were more likely to provide formal training to staff, followed by non-novel innovators and non-innovators (see Figure 6-8). The importance of training to facilitate innovation has been highlighted in previous research (e.g. Freel, 2000) and is clearly supported by this finding. There were no differences in the formal training provided by Queensland and other Australian firms.

Differences in the employment patterns between Queensland and other Australian firms were minor, with Queensland firms employing slightly smaller percentages of managerial and technological staff (see Figure 6-9). Nevertheless, this finding may be important in understanding the slightly lower innovation rate of Queensland firms found in this study.
6.4 Intellectual property (IP) protection

This year respondents were asked a question about IP protection. The majority of Australian firms used confidentiality agreements (35 per cent), as compared to copyright (19 per cent), trademarks (17 per cent) and patents (11 per cent). The low percentage of firms that indicated that their IP was protected by copyright may be indicative of a lack of understanding of the concept, i.e., there is no need to register copyright material as it is automatically protected when created.

These patterns were similar when Queensland firms were compared to the rest of Australia (see Figure 6-10). Small and statistically insignificant differences were, however, found for levels of copyright and trademarks, where Queensland firms were more likely to use these approaches. Queensland firms were slightly less likely to use patents for IP protection and this difference was statistically significant.
A comparison between firms with different levels of innovation revealed some differences (see Figure 6-11). Novel innovators were more likely to use all forms of IP protection than other firms and this difference was statistically significant. This could be because these firms are familiar with forms of protecting IP. However, the differences between non-novel and non-innovators were small.

**Figure 6-11 IP protection by innovation level (Queensland 1 year weighted)**

To further illuminate these results, a comparison of R&D active/non-active firms was undertaken (see Figure 6-12). This revealed statistically significant differences across all categories of IP protection, with R&D active firms much more likely to use all types of IP protection. In particular, these firms were more aware of informal forms of protection, such as confidentiality agreements and copyright.

**Figure 6-12 IP protection by R&D active (Queensland 1 year weighted)**
7 DRIVERS OF INNOVATION

7.1 Competitive situation

Four categories were created to report the number of competitors reported by firms, namely ‘no competitors’, ‘low competitors’ (1-3), ‘mid competitors’ (4-9) and ‘high competitors’ (ten and more). Non-innovating firms were distributed approximately equal across these categories. However, innovating firms were less likely to have no competitors. This result supports the prevailing view that competition is an important catalyst for innovation.

Figure 7-1 Competitive situation by innovation (Queensland 1 year weighted)

7.2 Growth intentions

The growth intentions of all firms were compared. Approximately 6 per cent reported the intention to become smaller, 32 per cent wanted to stay the same, 52 per cent wanted to grow moderately and 10 per cent wanted to grow substantially (for a summary of these numbers, see Table 7.3 in Technical Appendix). No statistically significant differences to these numbers were reported by non-Queensland firms. These numbers are lower than those reported during 2011, when 60 per cent of firms wanted to grow moderately and 19 per cent wanted to grow substantially. These figures evidence a change in outlook from growth to survival, and further support earlier findings in terms of engagement in innovation.

The growth intentions differed across innovation categories and this finding was statistically significant (see Figure 7-2). Novel and non-novel innovators were much more likely to have substantial growth objectives than non-innovators. Importantly though, novel and non-novel categories did not differ much from each other.
7.3 **Strategic planning**

Figure 7-3 compares different types of planning mechanisms used by innovating versus non-innovating firms. From this figure it is clear that innovating firms, and in particular novel innovators, were more likely to use all types of planning.
8 BUSINESS CONTEXT AND ENVIRONMENT

8.1 Barriers to business objectives

Firms were asked to report the importance of the barriers that they face in reaching their business objectives on a scale of one to five. These themes were repeated in the open ended questions (see Section 9).

Figure 8-1 reports the percentage of firms that rated a particular barrier as either a “very significant limitation” or “critical limitation”. Most important to both Queensland and other Australian firms were government regulations and compliance. While Queensland firms were more likely to rate this as important, the difference was not statistically significant. Red tape was followed by a lack of skilled labour and limited availability of finance, or cost of finance for expansion in Queensland. For the rest of Australia, it was followed by increasing competition and lack of growth in market demand.

The differences in these rankings were statistically significant across levels of innovation in Queensland firms (see Figure 8-2), for “overall growth of market demand” and “increasing competition”. For novel innovators red tape was still the most important barrier, which was followed by increased competition and limited markets. This is
consistent with theoretical arguments that state that firms innovate to outperform competitors or to grow markets (e.g. Bonanno & Haworth, 1998). Non-novel innovators tended to rank barriers higher in general, and although they identified the same three barriers as most important to novel innovators, they also viewed staff skills and finances (i.e. resources) as a problem. Following the earlier argument, non-innovators were less likely to view barriers as important to their business operations, but perhaps as a result of this, they were also not focusing on incorporating new products, services or processes into their business practices. Again, these themes were repeated in the open ended answers received from respondents (see Section 9).

Figure 8-2 Barriers to objectives by innovator level (Queensland 1 year weighted)

Figure 8-3 highlights how these patterns differed for other Australian firms. Notably, novel innovators from other states were more concerned with red tape. While the next three concerns for novel innovators were similar to those of Queensland firms, non-novel innovators in the rest of Australia did not rate barriers to the same extent as those from Queensland. None of these differences was statistically significant.
8.2 Government support

The awareness of Queensland firms of government support programs was investigated (see Figure 8-4). Business skills and capacity development was the category of which firms were both most aware (68 per cent) and most likely to access (13 per cent). In terms of actual use of programs (access), this was followed closely by self-help options (just below 13 per cent). Mentoring and grants were also each accessed by 9 per cent of respondents. Approximately 53 per cent of firms were aware of grants, but did not access them.

Figure 8-5 shows that when these data were compared against the data from other Australian firms, Queensland firms were more aware of government support across all categories. They were also more likely to access each program with the exception of differences in terms of grants and networking programs.
A comparison of patterns of awareness and access of government support among Queensland regions reveals a number of differences. Firms in the Northern region were much more likely to be aware of programs and actually access them across most programs. Similar to 2011, South-Eastern firms accessed programs at lower rates. That said, there was no statistically significant difference in general awareness of programs, with the exception of awareness of self-help programs that was lower for Southern and South-Eastern regions. This result most likely means that firms in more populated areas
that have many other options to solve problems are less dependent on government support.

**Figure 8-6 Awareness of government support (Queensland regions weighted)**

There were no statistically significant differences in how Queensland firms accessed government support when compared by firm size. Therefore innovator categories were compared next. Only one type of support, namely 'Business opportunity development', displayed a weak level of statistical significance, with novel innovators more likely to access this type of support than other firms.

### 8.3 Investment

A small percentage of all firms answered the questions relating to finance. Of the Queensland firms that did, 65 per cent were not seeking any additional finance. Almost two thirds of the Queensland firms that sought finance were unsuccessful (see Figure 8-7).
Figure 8-7 Finance sought by firms (weighted)

Figure 8-7 compares the patterns across firm sizes. Because of the low response rate to this question, all medium and large firms were collapsed into one category. The results indicate that micro firms were less likely to seek finance. Larger firms were also more likely to be successful at obtaining finance. Results were similar in firms in Queensland and in the rest of Australia.

Figure 8-8 Finance sought by firm size (weighted)

Figure 8-8 compares the types of finance used by Queensland and other Australian firms. Two thirds of firms used bank finance. Previously interviews have revealed that in many cases this was credit card and other forms of personal finance, rather than business loans. Hire purchase was also important (27 per cent), followed by family loans (22 per cent). Results were similar in both Queensland and in the rest of Australia.

Figure 8-9 compares the types of finance used by Queensland and other Australian firms. Two thirds of firms used bank finance. Previously interviews have revealed that in many cases this was credit card and other forms of personal finance, rather than business loans. Hire purchase was also important (27 per cent), followed by family loans (22 per cent). Results were similar in both Queensland and in the rest of Australia.
8.4 International sales

Approximately 25 per cent of Queensland and 23 per cent of other Australian firms reported international sales. Figure 8-10 compares the average of reported percentage sales to different regions between Queensland and other Australian firms. Queensland firms exported most often to North America, including Mexico (22 per cent), followed by Asia (13 per cent) and ‘other’ destinations (11 per cent).
A comparison of exports by innovator levels of Queensland firms revealed a weak statistically significant difference (see Figure 8-11). Novel innovators had slightly more international sales than other firms.

A comparison of exports by industry (see Figure 8-12) of Queensland firms revealed expected differences. Construction firms were most likely to concentrate on domestic markets, followed by transport and agriculture. The most prolific exporters were wholesale/retail, followed by information media and telecommunications, manufacturing and mining.
8.5 Competitive advantage

Respondents were asked to rate different sources of competitive advantage on a five point scale in terms of their importance. These were compared for firms with different levels of innovation. The most important change from last year is that all firms, including innovators, reported the importance of price and speed of service. This corresponds with the importance of customer demands, visible in other parts of the data, and supports the environmental uncertainty experienced by firms.
Figure 8-14 Competitive advantage by innovator level (Queensland 1 year weighted)

- Discovery and design of solutions to customers' unmet needs
- Personal attention and responsiveness to existing customer needs
- Flair and creativity
- Range of expertise/products/services
- Specialised expertise/product/service
- Product or service quality
- Product or service design
- Cost advantages
- Established reputation
- Speed of service
- Marketing and promotion skills
- Price

Legend:
- □ Non-innovator
- ■ Non-novel innovator
- ▪ Novel innovator
9 LONGITUDINAL ANALYSIS (PANEL DATA)

An analysis of the panel data is presented in this section. Based on responses from participants that provided information in both 2011 and 2012, two types of analyses were conducted. First, a number of practices are compared from 2011 to 2012 to understand how these firms changed what they did over the last year. Second, an analysis is presented of what firms that continued innovating in 2012 did differently from those that stopped innovating.

9.1 Changes in innovation and R&D levels

The first practice investigated was the proportion of firms that reported innovation in the panel data. Over a three year period, 64 per cent reported innovation in 2011 and 54 per cent in 2012; thus a statistically significant decrease of ten percentage points. Innovation activity by novelty as well as by product, service or process was compared. Similar to the overall figures, all types declined. However, these differences were almost solely caused by a drop in novel innovation of 11 percentage points (for all Australian firms), with non-novel innovation actually increasing one percentage point. Service innovation (14 percentage points) declined most, followed by product production, service operations, logistics, managerial process (nine percentage points), and product innovation (eight percentage points).

A comparison of R&D engagement between 2011 and 2012 indicated that firms were less engaged in R&D in 2012 as compared to 2011 and that these results were statistically significant. Panel firms reported 15 drop of percentages points in R&D activity.

Further analysis of the relationships between growth intentions, R&D engagement and novel innovation levels were conducted. This revealed that firms with high growth intentions in 2011 were (statistically significant) more likely to be novel innovators in 2012 – 17 percentage points higher than the average. Growth intentions in 2011 did not, however, have an effect on non-novel innovators. R&D engagement in 2011 also had an important impact on novel innovation in 2012, with almost 2.5 times more novel innovators engaging in R&D than non-novel innovators.

Success also seemed to breed success, with novel innovators in 2011 substantially more likely to have substantial growth intentions in 2012 – 40 per cent higher (or 6 percentage points higher than the average). Similarly novel innovators in 2011 were also more likely to keep on engaging in R&D in 2012 – 9 percentage points higher than the average.

9.2 Changes in sales from innovation

From a temporal point of view, firms first engage in innovation before they have sales from innovation. Sales from innovation during 2012 are therefore dependent on innovation activity in preceding years. Firms were asked what percentage of their sales during the last financial year could be attributed to: products or services unchanged or only marginally changed in the last three years (no innovation); significantly improved products or services introduced within the last three years (from non-novel innovation); and new products or services introduced within the last three years (from novel innovation). The results revealed that there was a small decrease in sales from novel innovation (17 per cent in 2011 to 14 per cent in 2012). Sales attributed to non-novel innovation remained steady, while those attributed to unchanged products and services increased by five percentage points.
The results above therefore indicate that the decline in novel innovation was already inherent in the practices of firms that responded in both years. In hindsight, it is thus possible to argue that while innovation levels in 2011 were still fairly high, they were most likely already on a decline from periods before; a decline that became more evident during 2012.

9.3 Changes in business practices

Barriers to business objectives and government support were also investigated. There were no significant differences found between 2011 and 2012 for barriers to business objectives. However, the data showed that firms’ awareness of grant and financial incentive programs increased over the last year. This change is not attributed to the fact that firms completed the survey a year earlier, since no differences were found for other programs.

Changes in collaboration behaviours were also investigated and revealed that firms that collaborated in 2011 had higher levels of innovation in 2012. Similarly, firms that were innovation active were more likely to be engaged in R&D, have a business plan and manage their accounts on a monthly basis.

9.4 Changes in growth intentions

To fully understand the nature of the changes in innovation, especially novel innovation levels, comparisons by firm size and industry with growth intentions were also undertaken. Figure 9-1 and Figure 9-2 present these results.

Comparison of panel responses between 2011 and 2012 indicates that lower proportions of firms reported moderate and substantial growth intentions. When compared by size, it was clear that the change was more substantial for smaller firms, while large firms reported an increase in growth intentions.

Figure 9-1 Growth intention by firm size (panel data 2011 and 2012)
A similar comparison across industries indicated that most industries also reported lower growth intentions. While these data should be interpreted with caution considering the small size of some of the strata, it does seem as if drops of more than ten percentage points from moderate and substantial growth intentions were observed in agriculture, mining, and manufacturing. That said, in industry sectors such as information, financial, electricity, transport and manufacturing at least 75 per cent of firms reported moderate or substantial growth intentions. These results mirror the innovation levels across industries.

**Figure 9-2 Growth intention by industry (panel data 2011 and 2012)**

![Figure 9-2 Growth intention by industry (panel data 2011 and 2012)](image-url)

- % Become smaller
- % Stay same size
- % Grow moderately
- % Grow substantially
10  GLOBAL AND LOCAL CHALLENGES

The survey asked: ‘What are the global/local challenges that have the biggest impact on your business? Please tell us in your own words.’ This open ended question was analysed with the use of Leximancer, a qualitative analysis software package (see explanatory textbox at the end of this section).

10.1 Global and local challenges by level of innovation

For the purposes of the ensuing qualitative analysis, firms were allocated to a category denoting engagement in innovation in the past year. These categories are similar to those described in the definition section and used throughout this report (novel, non-novel and non-innovators).

Figure 10-1 presents a concept map that was produced by analysing all comments that were provided in response to a question asking firm representatives to describe the global/local challenges that have the biggest impact on their business. These responses were analysed by each category of firm innovation. The concept map provides a graphical comparison of the relationship and thematic distance between the three categories of firm innovation. Prominent themes that occurred in the analysis are government, people, market, the dollar and mining.

Non-innovators

The placement of the three categories on the concept map suggests that some of the comments provided by non-innovator firms are distinct from those reported by innovators (both novel innovators and non-novel). The concept map suggests that non-innovator firms report people and market challenges as having a big impact on their business. On viewing prominent related comments, people often referred to the volatility of the spending habits of people. Below are two representative comments drawn from this category:

People are holding on to their money due to uncertainty which is just exacerbating the lack of money circulating in the community = downward spiral continuing to worsen. A significant number of people have been laid off due to large companies falling over which is adding to fear of further job losses and reduction in spending.

For the past 3 years with the GFC in full swing and then to be hit with Cyclone Yasi, we have found it pretty hard to make ends meet. Utilities have risen and people are less inclined to spend their hard earned money.

Non-novel innovators

The concept map suggests that non-novel and novel innovator firms provided comments that were closer in thematic content than non-innovator firms. Mining was the most prominent theme for non-novel innovator firms. Prominent related concepts were confidence and economy and often referred to the impact of the mining sector on the economy. Below are two representative comments drawn from this category:

The mining sector has skewed the economy resulting in the high Australian dollar; increasing the threat to Australian manufacturers from imported products. GFC reduced confidence and reduced finance availability reducing national economic activity.

The mining industry is making it difficult to keep good staff; we cannot compete with the wages they pay. Good mechanics are leaving our industry fast.
Novel innovators

The most prominent theme for novel innovator firms was dollar. Related concepts included costs, rate and tax. Comments related to this theme often referred to increasing costs and the high Australian dollar. Below are two representative comments drawn from this category:

As a manufacturer, the high Australian dollar gives us some advantage in the local market but kills export. The challenge for us will be what happens when the dollar drops and its cost impact on local product sales.

Exchange rate of Australian dollar and competing cheaper labour outside of Australia.

10.2 Global and local challenges by location

Figure 10-2 is a concept map that was produced by analysing all comments that were provided in response to a question asking firm representatives to describe the global/local challenges that have the biggest impact on their business. Comments provided for Queensland were analysed separately to those provided for other Australian states and territories. The concept map provides a graphical comparison of the relationship and thematic distance between the two categories of location—Queensland and other states and territories. Prominent themes that emerged in the analysis are government, people, market, competition and impact.

Queensland firms

The most prominent theme for Queensland firms was people. Related and co-occurring concepts included spending and money; indicating that ‘people’ were indeed customers and potential customers. A review of comments related to these prominent concepts suggested that Queensland firms reported that changes in the spending habits of people...
were having a big impact on their business. Below are two representative comments drawn from this category:

In general, people do not have the disposable cash at hand. Because of the GFC, people are unable (or frightened) to spend.

The GFC changed peoples spending habits. The QLD floods in 2011 were a disaster for business.

**Firms in other states and territories**
The most prominent themes that emerged for other states and territories related to market competition and time. Concepts related to competition included tax rate and mining. Comments related to this theme often referred the challenges of increased competition. Below are two representative comments drawn from this category:

We have to keep finding niche markets in the face of major competition.

Shrinking markets and increased competition from others exiting the private for public sector opportunities.

**Figure 10-2 Challenges among firms in Queensland and rest of Australia**

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**Interpreting Leximancer maps**

Leximancer uses word association information to rapidly consolidate a large body of text into meaningful “themes” and “concepts”, which are represented graphically on a map. Proximity and spatial relationship between concepts denote co-occurrence and inter-relationships. To interpret the maps, keep in mind that:

- The grey labels are concepts that represent key issues according to participants.
- The darker or larger the concept’s label, the more frequently it occurs in the text.
- Concepts that sit near one another are related somehow.
- The coloured circles capture clusters of concepts that represented major themes.
- The tags on the border of the maps show the content from different types of participants or in response to particular questions.
11 BIBLIOGRAPHY


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