

DYNAMIC CAPABILITIES:

How **Australian** firms
can survive and **thrive**
in **uncertain** times

2023



**CEDA –
the Committee
for Economic
Development
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This paper is a result of joint research between CEDA and the University of Technology Sydney (UTS).



About CEDA

CEDA is Australia's leading member-driven think tank. Our purpose is to achieve sustainable long-term prosperity for all Australians.

Our trusted independence, and a deep and broad membership base that extends across all sectors, states and territories, enables us to bring diverse perspectives and insights to guide and advance policy debate and development in the national interest.

We aim to influence future economic, social and environmental outcomes by:

- Promoting public discussion of the challenges and opportunities facing Australia;
- Enabling members to shape future outcomes through policy and their own actions;
- Partnering and collaborating to tackle emerging opportunities and entrenched challenges; and
- Advocating for policy change based on our independent research insights.

Our work is overseen by our independent Board of Directors and our research is guided and approved by an independent Research and Policy Committee whose members are leading economists, researchers and policy experts.





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CEDA **IMPACT** STATEMENT: BUSINESS DYNAMISM AND INNOVATION

CEDA has a proud history of research and advocacy on innovation and capability.

In 2007, we considered the role of a national innovation system in transforming knowledge and resources into dynamic capabilities within firms, to contribute to innovation at the national level.

In 2022, our *Science x Technology* report found we need to step up Australia's industrial and innovative capability if we want to pursue an innovative economy and tackle critical megatrends.

This report takes the conversation a step further, by enhancing our understanding of capabilities within firms through the first broad survey of the dynamic capabilities of Australian businesses.

The outcomes we are seeking from this report include:

- Businesses must understand their firm's capabilities, where they are lacking and how to improve, including through education and training.
- More firms need to prioritise innovation over efficiency. They need to find the people, time and money to take advantage of new opportunities and position for the future.
- Australian businesses must get better at transforming. Leaders need to embrace renewal and change and take smart risks in the face of uncertainty.
- We need more diverse leadership at executive and board level.
- Governments should ensure that regulations are well-designed and do not stifle innovation, especially for small businesses.

Business, governments and the broader community all have a stake in better outcomes in this space.



Dynamic capabilities

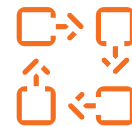
Firms with stronger dynamic capabilities are more resilient, productive and profitable, enabling them to support more innovative cultures. They can:



Sense opportunities, threats, and customer needs



Seize opportunities to satisfy customers, shape markets and capture value



Transform themselves when renewal is needed

CEDA's survey of 149 business leaders revealed significant differences between the most dynamic quarter of firms and least dynamic quarter:

63% of top firms had higher productivity

compared with

54% of the weakest firms

85% of the top firms had higher net profits

compared with

61% of the weakest firms

After June 2020

54% of top firms innovated by overhauling their management processes

compared with

26% of the weakest firms

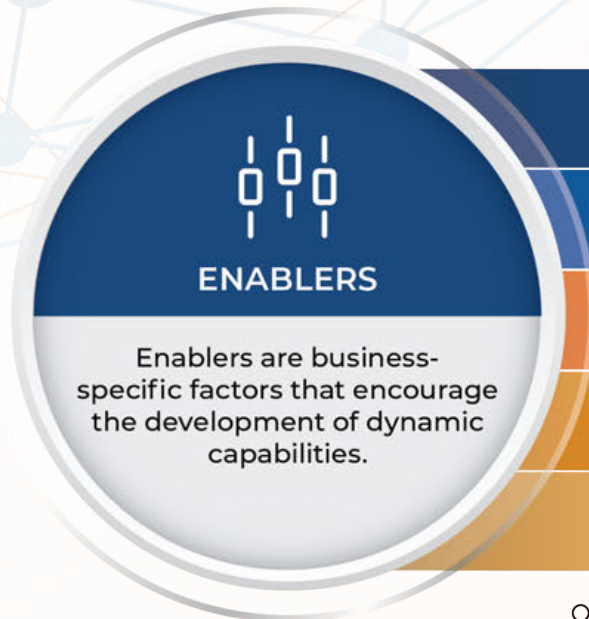
In the first few months of the pandemic

81% of top performing companies with a board had at least one **director that was female**, at least one that had **science and technology expertise** and at least one with **international experience**

compared with

26% of the weakest firms

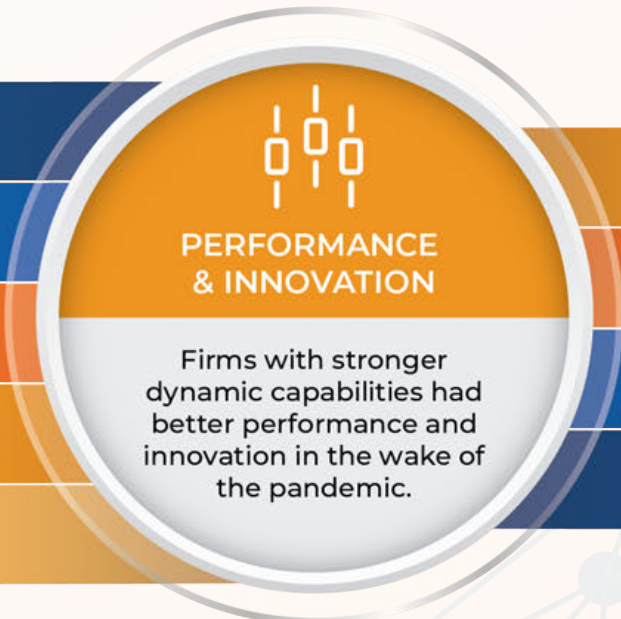




- WILLINGNESS TO CANNABALISE
• An organisational culture that recognises pursuing new opportunities may involve shifting the focus away from current resources
- CONSTRUCTIVE CONFLICT
• The rigorous debate of ideas, beliefs and assumptions within a firm
- TOLERANCE FOR FAILURE
• Firms see failure as an inevitable, and even beneficial, consequence of exploration
- SCANNING
• Monitoring and analysing the environment for opportunities in new markets and new technologies
- SLACK AND AGILITY
• Labour and financial resources that are not taken up by 'business as usual'



- SENSING
• Sense opportunities, threats and customer needs
- SEIZING
• Seize opportunities to satisfy customers, shape markets and capture value
- TRANSFORMING
• Transform themselves when renewal is needed



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| <ul style="list-style-type: none"> • CUSTOMER-RELATED PERFORMANCE • FINANCIAL PERFORMANCE • EMPLOYEE-RELATED PERFORMANCE • DOMESTIC MARKET PERFORMANCE • EXPORT MARKET PERFORMANCE | <ul style="list-style-type: none"> • GOODS OR SERVICES • OPERATIONAL PROCESSES • ORGANISATIONAL/MANAGERIAL PROCESSES • MARKETING METHODS |
|---|--|

PERFORMANCE

INNOVATION



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EXECUTIVE SUMMARY

Australia has a productivity problem.

It has been critical to our rising prosperity and living standards, contributing more than 80 per cent of our growth in real gross national income per capita over the past 30 years.

But labour productivity growth has fallen to a 60-year low, and the gap between Australian firms and the global frontier is widening.

Climate change, heightened global tensions, a large and growing services sector and an ageing population are now all major challenges. Heightened inflation, capacity constraints and slow wages growth across the economy are compounding these difficulties.

Businesses need to know how to survive and thrive in this uncertain environment. What happens within businesses – or firm-level capabilities – is more important than ever. Their capabilities are critical not just for their own success, but also for our economic growth, productivity and innovation.

There are two types of firm-level capabilities.

- **Ordinary capabilities** are the basic skills needed to run a business in normal times. They are largely operational and focused on efficiency.
- **Dynamic capabilities** are more forward looking and strategic. In environments that are highly volatile, uncertain, complex and ambiguous, these capabilities help businesses to maximise their chances of long-run survival and success.

*"This cycle of **sensing**, **seizing** and **transforming** is essential for ongoing viability and **success** in a world of **changing** customers, markets, technologies and a dynamic environment."*

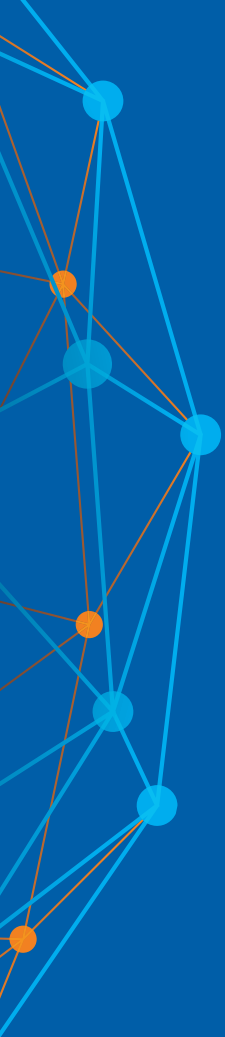
Firms with strong dynamic capabilities can:

- **Sense** opportunities, threats and customer needs;
- **Seize** opportunities to satisfy customers, shape markets and capture value; and
- **Transform** themselves when renewal is needed.

This cycle of sensing, seizing and transforming is essential for ongoing viability and success in a world of changing customers, markets, technologies, and a dynamic environment. Firms with stronger dynamic capabilities are more resilient, productive and profitable, enabling them to support more innovative cultures.

Little is currently known about the dynamic capabilities of Australian businesses. That's why CEDA, with the University of Technology Sydney (UTS), has conducted the first broad survey of dynamic capabilities of Australian businesses.





"We found firms need spare capacity to build their capabilities and pursue long-term opportunities. Yet their consistent message is that they lack bandwidth beyond business-as-usual."

Key lessons

For business leaders, this survey shows that dynamic capabilities help to drive firm performance, resilience and decision-making under uncertainty. Firms with stronger dynamic capabilities were more innovative in the early months of COVID-19, introducing new marketing methods and overhauling organisational processes. As the pandemic continued, they had better net profits, productivity, customer satisfaction and employee outcomes.

We also found almost all businesses need to strengthen their capabilities. Managers need to critically assess their firm's capabilities, identify gaps and take steps to fix them.

Australian businesses must also get better at transforming. Renewal and change are hard. But without these, firms can fall victim to structural inertia and cultural lock-in, which can ultimately be their demise.

We found firms need spare capacity to build their capabilities and pursue long-term opportunities. Yet their consistent message is that they lack bandwidth beyond "business as usual".

Carving out space to look to the future is particularly challenging in the current economic environment, and something that smaller firms often struggle with. Yet if they can't lift their eyes and devote resources to growth and new opportunities, Australia's innovation and productivity growth will continue to suffer.

Diversity in leadership is critical. Firms with stronger dynamic capabilities had more diverse boards, with more directors who are female, have science, technology and engineering expertise, or have international experience. Enhancing diversity can therefore bring quick wins.

Yet boards are often made up of compliance-oriented professionals and are focused on onerous regulations. This often comes at the cost of capability building and long-term strategic planning.

"Building dynamic capabilities could be one of the most practical and effective ways of boosting our flagging productivity, our innovation and the resilience of Australian businesses."

Finally, the top-performing firms in our survey were more interested in receiving feedback. This is consistent with international evidence, and suggests firms that are more interested in their own capabilities are also more likely to build those capabilities.

Building dynamic capabilities could be one of the most practical and effective ways of boosting our flagging productivity, our innovation and the resilience of Australian businesses.

Education is one way to achieve this. This could include a combination of embedding dynamic capabilities in business courses and MBAs, broad-reaching micro-credential programs and programs that target specific firms, such as the frontier firms training program in New Zealand. Deeper engagement with the research community would also help businesses to unlock innovative potential.

Many of Australia's largest sectors are highly regulated. Governments need to recognise that, despite good intentions, poorly designed and onerous regulations can have big opportunity costs, particularly for small businesses. Regulation must be used wisely. This would also encourage a shift in culture and incentives from compliance to innovation.

Migration can also increase diversity of experience and skills, particularly on boards and in leadership roles. Attracting both skilled migrants and expats back to Australia can be a strategic way to supplement domestic capabilities.

Australia has a long and enviable history of economic prosperity and high living standards. We must boost productivity, innovation and resilience amid increasing uncertainty to ensure this continues. This cannot be done without dynamic businesses.

Building the capabilities of Australian businesses today will be critical to our success and prosperity tomorrow.



INTRODUCTION

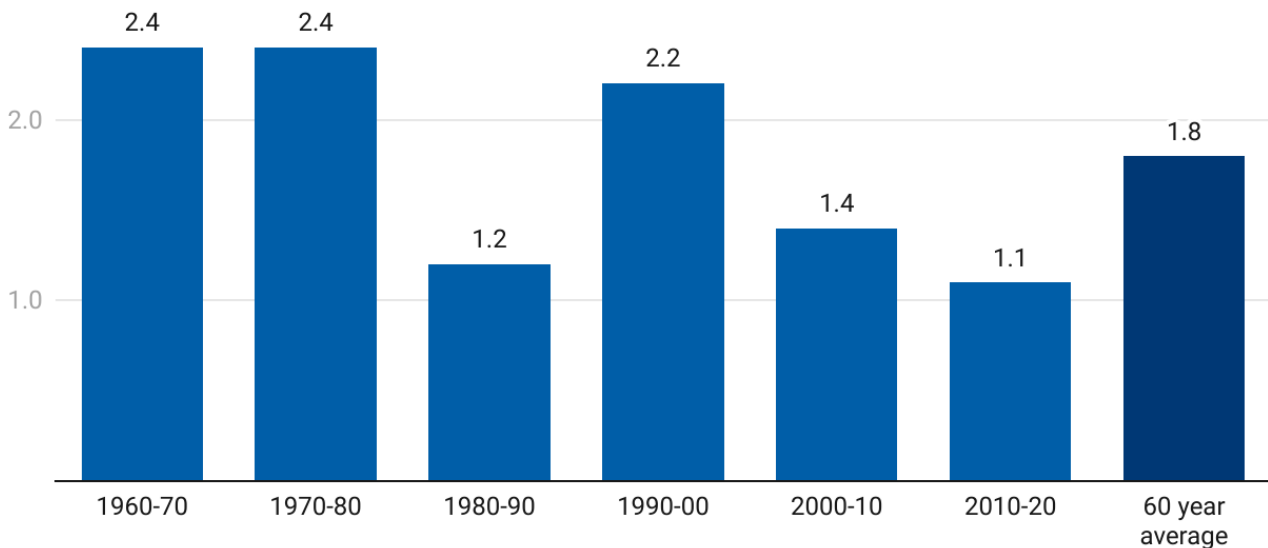
Productivity is the key driver of rising prosperity and living standards. In Australia, labour productivity growth has contributed more than 80 per cent of the growth in real gross national income per person over the past 30 years.¹

But we are falling behind – both relative to history and compared with other countries. The Productivity Commission’s recent five-year review found productivity is growing at its slowest pace in 60 years (Figure 1).² Treasury research has also revealed a widening productivity gap between Australian firms and the best of the rest of the world over the past two decades.³

FIGURE 1

Labour productivity growth is at its slowest pace in 60 years

Labour productivity growth by decade (%)



Labour productivity calculated as GDP per hour worked. GDP data sourced from the ABS between 1959-60 and 2021-22. Hours worked data from Penn World Tables for between 1959-60 and 1973-74 and from the ABS between 1974-75 and 2021-22.

Source: Productivity Commission 5-year Productivity Inquiry Report • Created with Datawrapper

The Federal Government has reduced the productivity growth assumption in its annual economic forecasts from 1.5 per cent to 1.2 per cent. This implies that in 40 years' time, the average Australian will be 20 per cent poorer than they otherwise would be.⁴

Little is currently known about dynamic capabilities within Australian firms. Public debate about investment, innovation and productivity is often focused on the policy levers that governments can pull. But businesses also play a critical role.

Economic analysis has traditionally treated firms as homogeneous black boxes, but more economists are now recognising that what happens within business can drive differences in the wealth of nations.⁵ International research shows that management practices matter for business performance, and ultimately for productivity and prosperity at the national level.



"Differences in ordinary management capabilities may explain up to half of the productivity gap between Australia and the United States."

There are two types of firm-level capabilities: ordinary and dynamic.

Ordinary capabilities are largely operational and focused on efficiency or “doing things right” in normal times. Firms with strong ordinary capabilities are good at running their day-to-day operations, setting targets, and managing staff performance. Improving these capabilities has benefits both for individual firms and for the economy as a whole.

Differences in ordinary management capabilities may explain up to half of the productivity gap between Australia and the United States.⁶ Improving management practices could therefore be an extremely effective way for firms – and whole economies – to boost their productivity.⁷

But ordinary capabilities are for normal times when the operating environment is stable, which is a far cry from today. The megatrends of the past few years – including pandemics, climate change, rapid technological change, an ageing population and geopolitical shifts – are not going away. Businesses must be prepared if they want not only to survive, but also thrive, in an increasingly uncertain and rapidly changing world.

This is where *dynamic capabilities* are critical. They are forward-looking and strategic, concerned with “doing the right things” and focused on effectiveness and innovation to sustain competitive advantage.⁸

The framework of *sensing, seizing* and *transforming*, first conceptualised by David Teece, aims to explain differences in the long-run growth, survival and failure of firms; in other words, business dynamism. It examines how particular firms can be better or worse at identifying new opportunities, managing competitive threats, using their resources and making necessary transformations.

These capabilities contribute to business dynamism and national productivity by ensuring that even mature firms respond to competitive threats and economic shifts by transforming rather than standing still.

FIGURE 2

What are dynamic capabilities?⁹



• SENSING

- Sensing is about continuously seeking to identify threats, opportunities and customer needs. Firms that sense well can manage their current business profitably while also exploring whether it's the right business model for the future. These firms are good at acquiring strategic information including market trends, best practices and competitors' activities.

EXAMPLE

Apple's realisation of latent demand for a smaller .mp3 player.¹⁰



• SEIZING

- Seizing is about innovating and implementing a business model to satisfy customers, shape markets and capture value. This involves recognising valuable information, then selecting and developing opportunities that best fit the firm's environment, strengths and weaknesses. Market opportunities are exploited and threats are avoided. It is closely linked with strategic decision-making, especially investment decisions.

EXAMPLE

Nokia missed the smartphone revolution because unlike Apple it was not well equipped for seizing.



• TRANSFORMING

- Transforming is about periodic, strategic renewal through adapting resources, structures and processes as markets and technologies change. Renewal may be required when there are new opportunities to pursue or organisational rigidities have developed. Transforming involves taking action on new business models, products or process innovations.

EXAMPLE

Apple's shift from a focus on computers to broader consumer electronics.

This cycle of sensing, seizing and transforming is essential for a firm's ongoing viability and success in a world of changing customers, markets and technologies. Firms with stronger dynamic capabilities are more resilient, productive and innovative. While stronger ordinary capabilities can bring firms closer to the productivity frontier, stronger dynamic capabilities can expand this frontier.

BOX 1

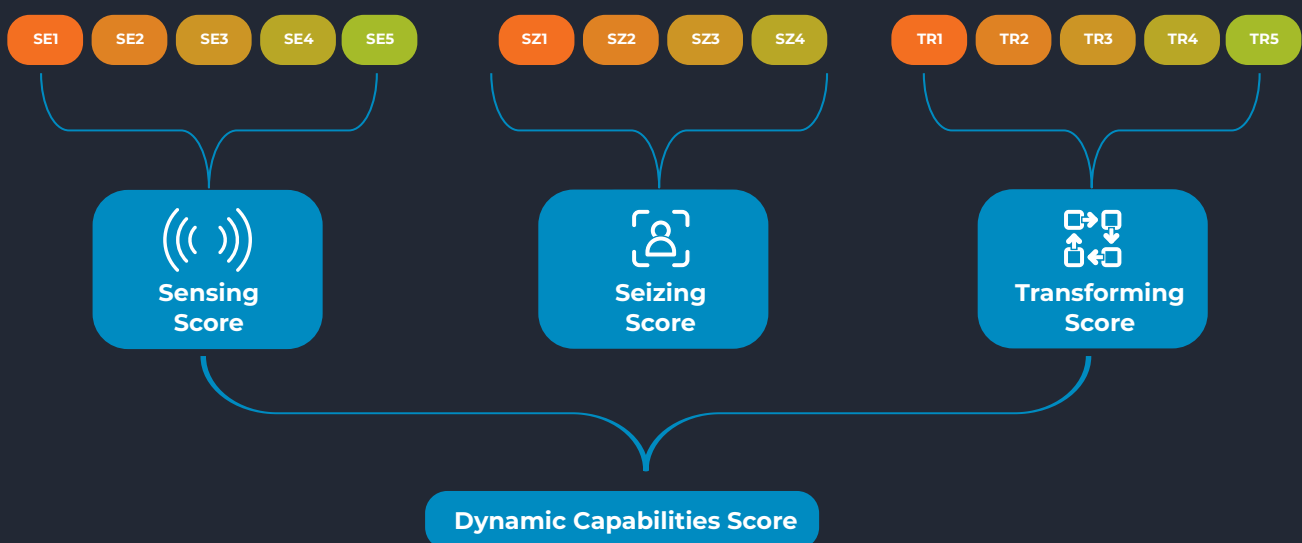
SURVEY DESIGN

CEDA, with experts from UTS, has developed and conducted the first broad survey of the dynamic capabilities of Australian businesses.

We surveyed 149 managers of businesses of all sizes and a range of sectors around the country.

- Respondents were mostly experienced senior leaders involved in strategic decision-making, making it a high-quality sample.
- The survey drew on existing, already-validated surveys in the literature.
- Questions were tested and refined based on feedback from CEDA members with relevant business and research experience.
- CEDA conducted the survey via SurveyMonkey. It was launched in late 2021 and was open for approximately 12 months.
- Each respondent was asked to rate their business on a scale from 1 to 6 across 14 dimensions in the categories of sensing, seizing and transforming.
- Respondents were asked questions about their business's innovation and performance during the pandemic and a range of business characteristics.
- They were also asked about five cultural, structural and other business-specific factors that encourage the development of dynamic capabilities, which we termed "enablers".
- We calculated the simple average of the three sensing, seizing and transforming scores to determine each business's overall dynamic capabilities score.

(For more detail, see Appendix 1.)





KEY FINDINGS

1. Dynamic capabilities yield big economic dividends, especially in uncertain times

Firms with strong dynamic capabilities are resilient and can successfully navigate unexpected events with minimal disruption, rather than resorting to crisis management.¹¹ For example, there is evidence that firms with stronger dynamic capabilities were more resilient during the Global Financial Crisis.¹²

We analysed the link between dynamic capabilities and innovation during the pandemic, a recent period of deep uncertainty. We found that, all else equal, **firms with stronger dynamic capabilities were more innovative in the first few months of COVID-19** (Figure 3; for detailed results, see Appendix 3.)

FIGURE 3

Dynamic capabilities contributed to more innovation during the pandemic

Impact of a one point increase in dynamic capabilities scores on innovation.

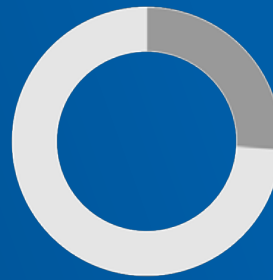
	Dynamic Capabilities	Sensing	Seizing	Transforming
First few months of COVID-19				
Operational processes		0.5		0.44
Organisational/managerial	0.71	0.62	0.4	0.48
Marketing methods	0.82	0.48		0.77
Goods or services				0.46
Post June 2020				
Operational processes				
Organisational/managerial				
Marketing methods	0.6		0.63	0.42
Goods or services				

Statistically significant logit regression coefficients; see appendix for full regression results. Capabilities are measured on a scale of 1 to 6. Innovation dummy variable equal to 1 if the firm undertook any innovation during the period.

Source: Dynamic Capabilities Survey, CEDA • Created with Datawrapper



54 per cent of top performers overhauled their management processes in the first few months of the pandemic



Only 26 per cent of the weakest firms overhauled their management processes in the first few months of the pandemic

The most dynamic 25 per cent of firms also undertook more innovation in the wake of COVID-19 than the least dynamic 25 per cent of firms across all areas of innovation in the survey (Figure 4). Specifically:

- 54 per cent of top performers overhauled their management processes in the first few months of the pandemic, compared with 26 per cent of the weakest firms.
- 46 per cent of top performers introduced new or better marketing methods in the first few months of the pandemic, compared with 19 per cent of the weakest firms.

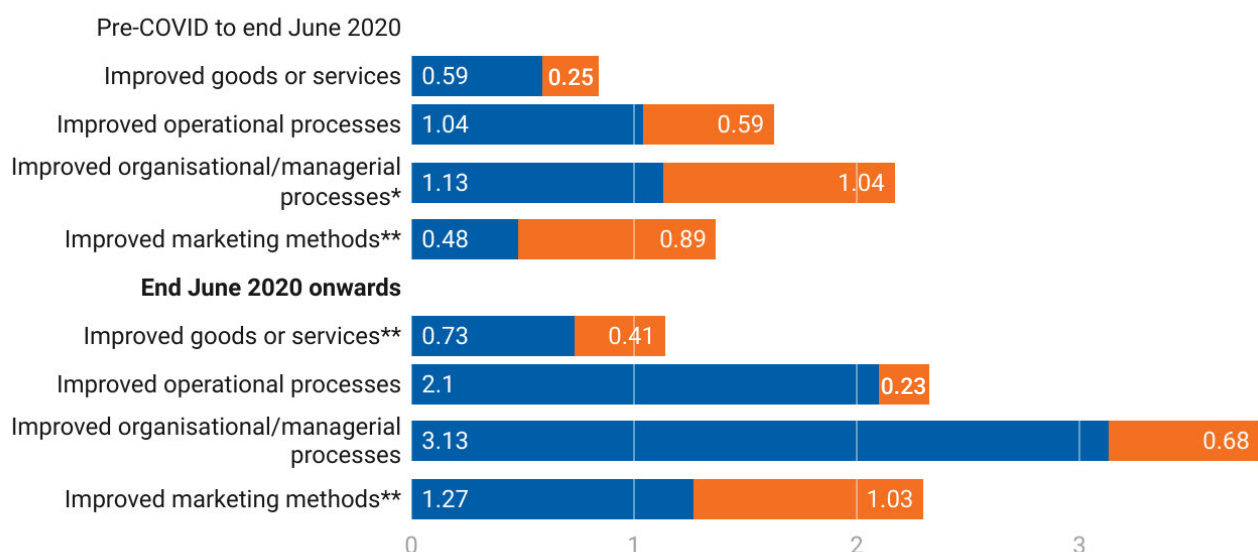
The most dynamic firms were better able to adapt and innovate in the highly uncertain COVID-19 environment. Sensing was particularly useful early in the pandemic, while transforming was most valuable across multiple forms of innovation. Given that transforming is a weakness for most Australian firms, lifting capabilities in this area could help to improve innovation.

FIGURE 4

Firms with stronger dynamic capabilities are more innovative

Average innovation scores

Bottom performers Top performers

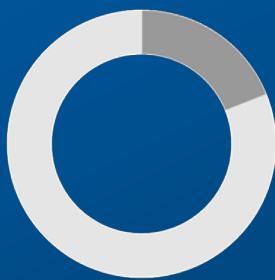


Firms in the bottom 25 per cent versus the top 25 per cent of dynamic capabilities scores. Innovation scores are a count of innovations undertaken and not directly comparable to performance scores. Asterisks denote significance at the *** 1%, ** 5% and * 10% level.

Source: Dynamic Capabilities Survey, CEDA • Created with Datawrapper



46 per cent of top performers introduced new or better marketing methods in the first few months of the pandemic



...compared with 19 per cent of the weakest firms

We also found that **firms with stronger dynamic capabilities performed better in the wake of the COVID-19 pandemic**, especially from June 2020 onwards. This suggests that the innovations made early in the pandemic set firms up for success later on, and that dynamic capabilities were crucial in adapting to this shock.

All else equal, firms with higher scores had significantly better customer, financial and employee-related performance after June 2020. They also had significantly better employee-related performance in the first few months of COVID-19. Employee-related performance was measured across a range of metrics, including number of employees, as well as implementation of strategies to reduce employee turnover, and improve staff skills, satisfaction and commitment. (For detailed results, see Appendix 3.)

Results for export and domestic market performance were not significant, possibly because larger trends (such as the sudden shift in demand to goods rather than services) dominated the effects of dynamic capabilities during this period.

FIGURE 5

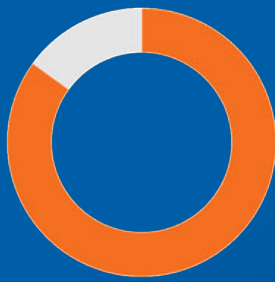
Dynamic capabilities contributed to improved firm performance during the pandemic

Impact of a one point increase in dynamic capabilities scores on performance

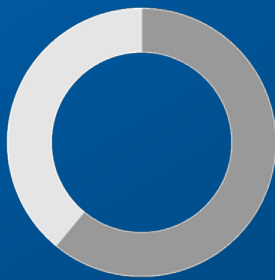
	Dynamic Capabilities	Sensing	Seizing	Transforming
First few months of COVID-19				
Customer performance				
Financial performance				
Employee-related performance	0.13	0.09		0.14
Post June 2020				
Customer performance	0.22			
Financial performance	0.29	0.22	0.24	0.18
Employee-related performance	0.31	0.23	0.21	0.23

Statistically significant OLS regression coefficients; see appendix for full regression results. Capabilities are measured on a scale of 1 to 6. Performance measured on a scale of 1 to 5.

Source: Dynamic Capabilities Survey, CEDA • Created with Datawrapper



85 per cent of top performers had higher net profits after June 2020



61 per cent of the weakest firms had higher net profits after June 2020

Comparing the most dynamic 25 per cent of firms with the least dynamic 25 per cent, we found:

- 85 per cent of top performers had higher net profits after June 2020, compared with 61 per cent of the weakest firms.
- 63 per cent of top performers had higher productivity after June 2020, compared with 54 per cent of the weakest firms.
- 70 per cent of top performers introduced strategies to reduce employee turnover after June 2020, compared with 46 per cent of the weakest firms.
- 78 per cent of top performers introduced strategies to improve employee satisfaction after June 2020, compared with 46 per cent of the weakest firms.

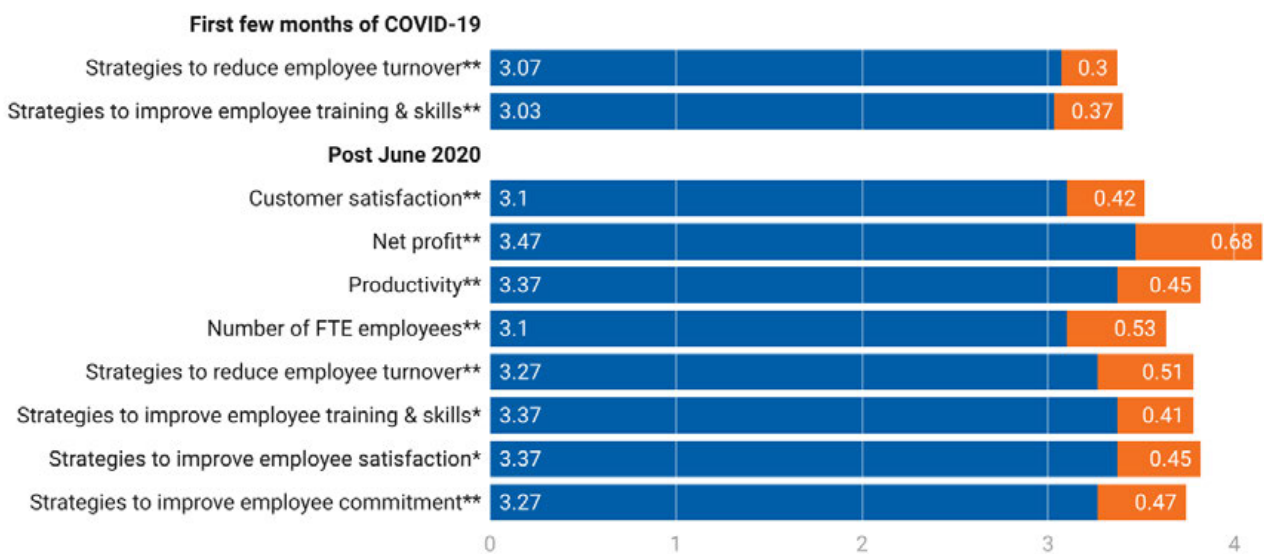
Sensing, seizing and transforming all helped improve employee-related outcomes and net profits after June 2020. Sensing and seizing were particularly important for customer satisfaction, while transforming was particularly relevant for productivity.

FIGURE 6

Firms with stronger dynamic capabilities perform better

Average performance scores

Bottom performers Top performers



Firms in the bottom 25 per cent versus the top 25 per cent of dynamic capabilities scores. Selected performance measures only. Asterisks denote significance at the *** 1%, ** 5% and * 10% level.

Source: Dynamic Capabilities Survey, CEDA • Created with Datawrapper

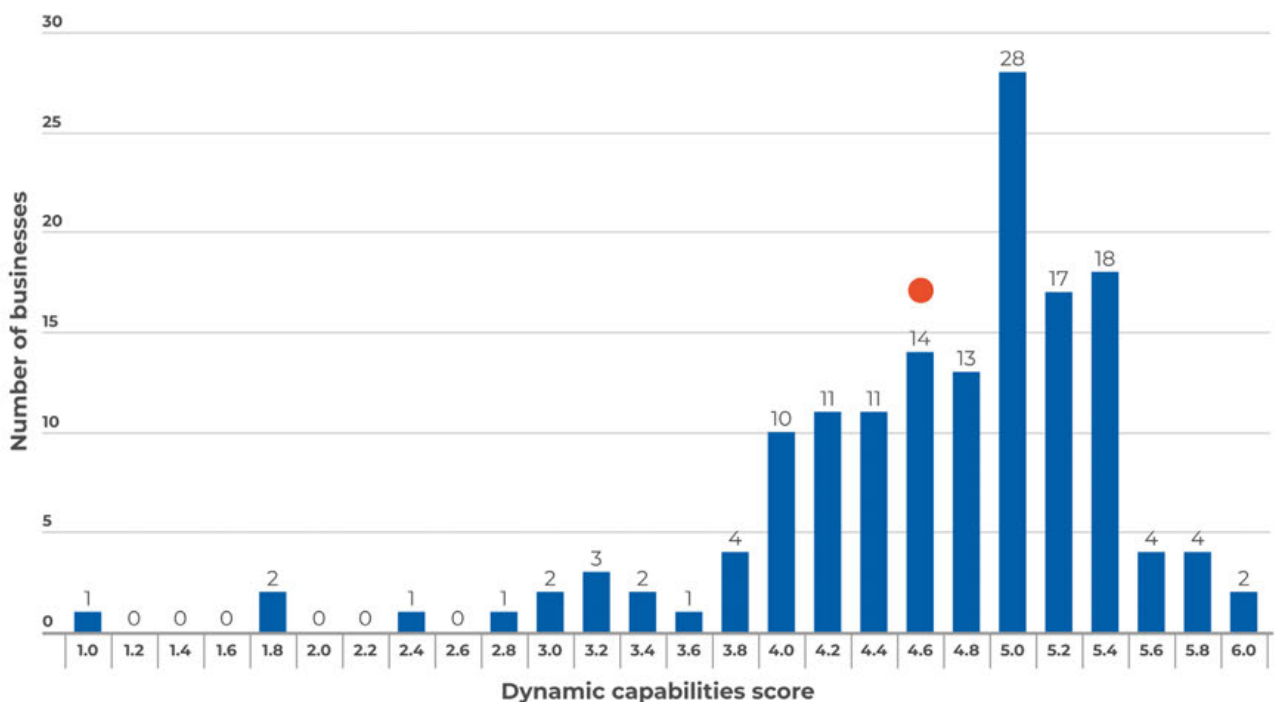
2. Australian businesses have significant room for improvement

Some firms had stronger dynamic capabilities than others, but almost all had room for improvement. Firms scored across the full range of possible outcomes (from an average response of 1 or “strongly disagree” to 6 or “strongly agree”) but were clustered around 4 to 5 (“slightly agree” to “agree”), with a mean score of 4.6. Almost 60 per cent of firms scored above the mean (Figure 7).

FIGURE 7

Most firms have room to improve their dynamic capabilities

Distribution of dynamic capabilities scores



Source: Dynamic capabilities survey, CEDA

● Average DC score

There was a tail of weak performers, with around eight per cent of firms scoring below 3.5. Almost all firms had room for improvement, with only two reaching the maximum score of 6.

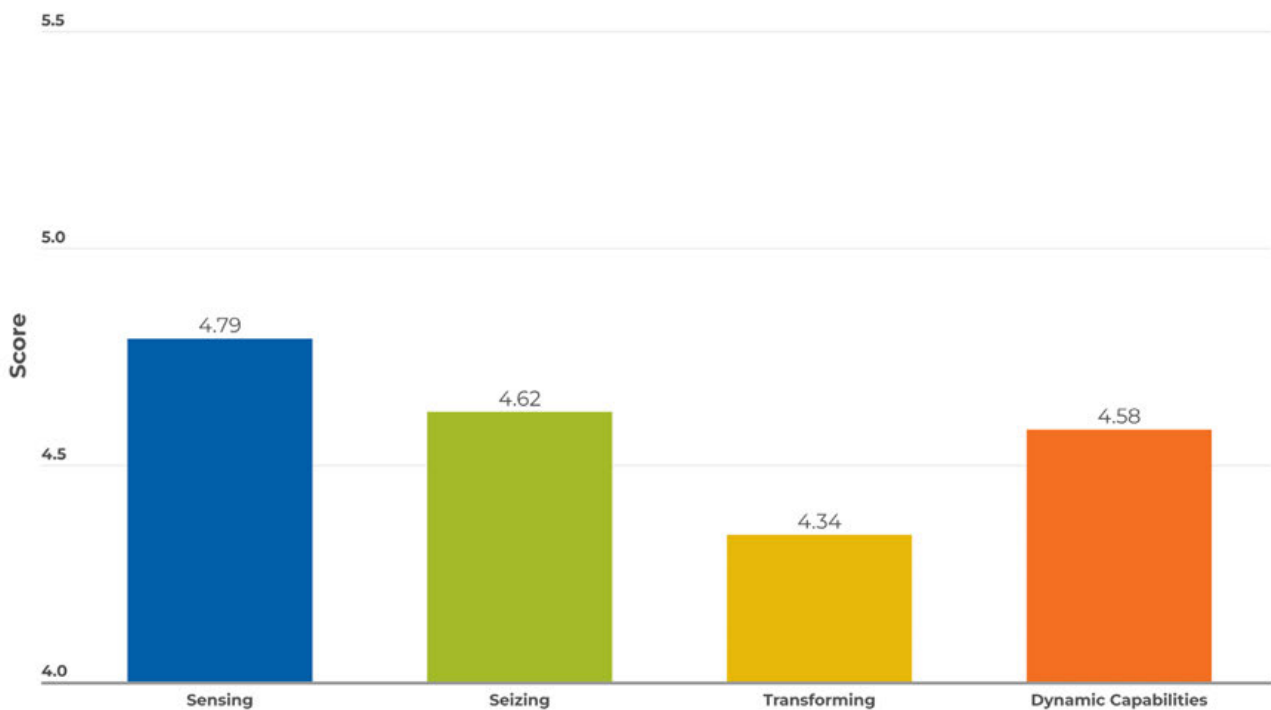
Australian businesses were strongest at sensing and weakest at transforming. By category, sensing had the highest average score in our sample (4.8), followed by seizing (4.6), while transforming had the lowest average score (4.3). These scores are broadly similar to those of Kump et al's (2019) survey of Austrian businesses, on which our survey is based.¹³

Sensing, seizing and transforming were positively related to one another (correlation coefficients of 0.6 to 0.7), consistent with the theory that sensing, seizing and transforming are interrelated capabilities.

FIGURE 8

Transforming is a key area of weakness

Average dynamic capability scores

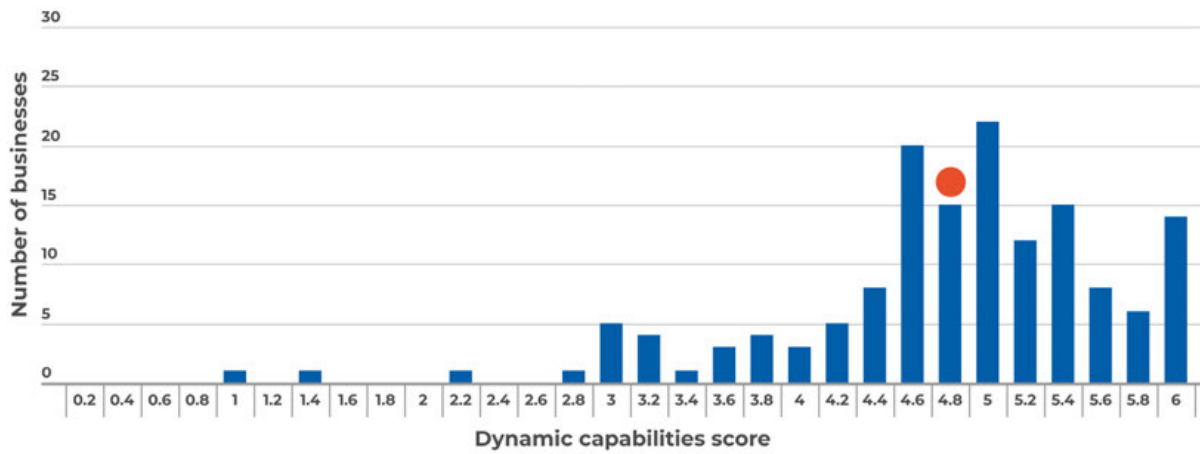


Source: Dynamic capabilities survey, CEDA

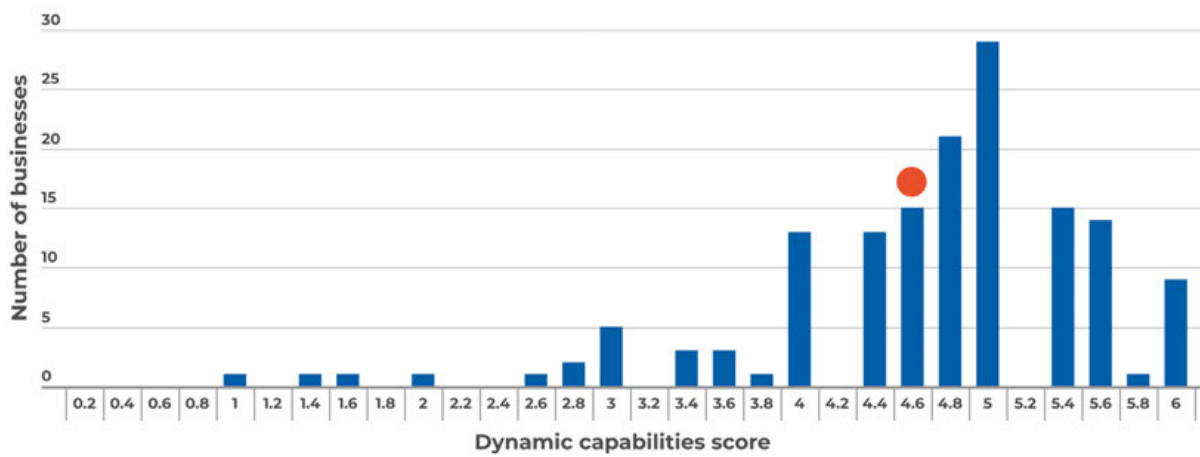
FIGURE 9

There is a broad range of capabilities across firms

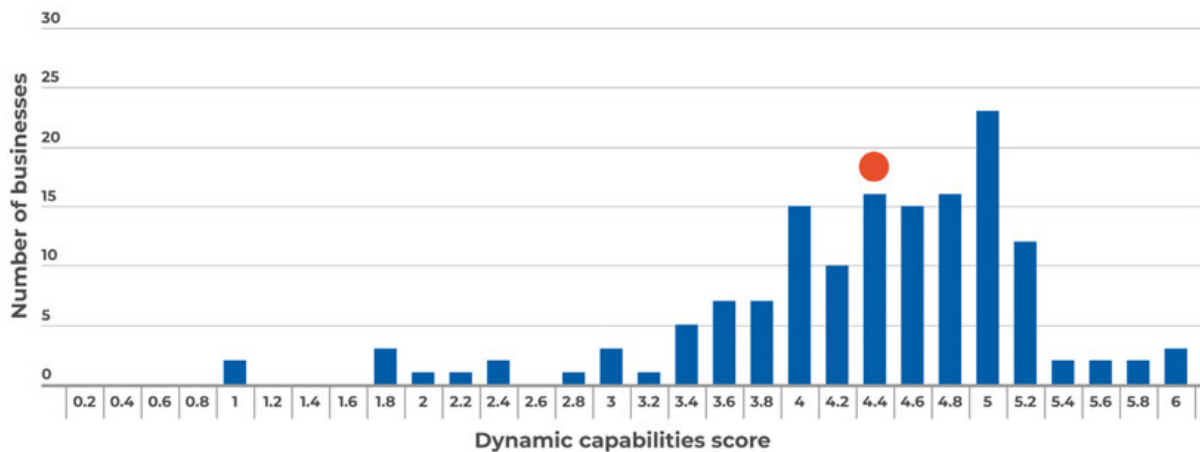
Sensing distribution



Seizing distribution



Transforming distribution



Source: Dynamic capabilities survey, CEDA

● Average score

Within each category, differences between firms were also significant (Figure 10). The top 25 per cent of firms in each category had an average score of around 5.0 to 5.4 (“agree” or a bit higher). This was 1 point higher than the bottom 25 per cent in each category, which had an average score of around 4.0 to 4.6 (“slightly agree” or a bit higher). These differences point to considerable room for improvement and learning.

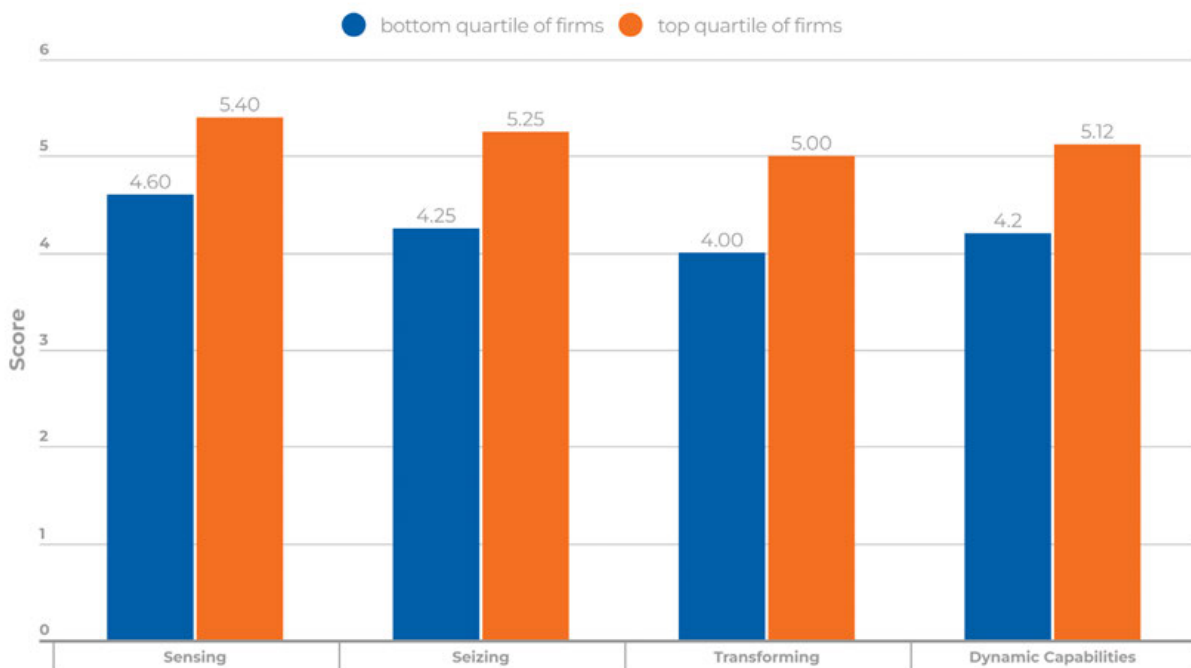
Transforming is hard. Firms must focus their efforts here. Previous research has shown almost one in three Australian CEOs believe their company won’t exist 10 years from now if they continue down the same path.¹⁴ The things that make a business successful today make it more difficult to change for tomorrow.

Business leaders are often reluctant to take assets and capabilities from an existing part of the business to grow a new part of the business, but ultimately this can be their downfall.¹⁵ Transforming requires managers to be bold and take smart risks to build competitive advantage.¹⁶

FIGURE 10

Differences in capabilities between top and bottom performers are statistically significant

Average capabilities scores of firms in top quartile versus firms in bottom quartile



Source: Dynamic capabilities survey, CEDA



BOX 2

Transformation fails

Without renewal and shifts in strategy, firms can fall victim to inertia and cultural lock-in.¹⁷

- Australia's oldest newspaper publisher, Fairfax Media, was a high-profile victim of this phenomenon when it failed to foresee the end of its "rivers of gold" in revenue from classified advertising amid the shift to digital advertising. It was eventually taken over by broadcasting company Nine Entertainment in 2018.¹⁸
- The US coffee chain Starbucks also failed to adapt when faced with challenges in Australia. It expanded rapidly from its arrival in 2000 to have 90 stores by 2008. That year, it closed 70 per cent of its Australian outlets. Its failure was driven by underestimating existing competition, a failure to adapt to local customers' tastes and the rapid pace of expansion.¹⁹
- Finnish company Nokia held more than 40 per cent of global market share in mobile phones in 2008. Just six years later, in 2013, it sold its mobile phone business to Microsoft²⁰ after it failed to properly adapt to the rise of apps, and Apple's iOS and Google's Android smartphone operating systems.
- Finally, despite inventing the world's first digital camera in 1975,²¹ the US camera and film-maker Kodak went on the defence with the rise of the new technology²² and instead diverted resources to emerging markets. It filed for bankruptcy protection in 2012.²³

3. Firms need to make space for capability building and exploration

We asked about the cultural, structural and other business-specific factors that might encourage the development of dynamic capabilities (see Box 3). We found all five of these factors, which we termed enablers, had a strong relationship with dynamic capabilities.

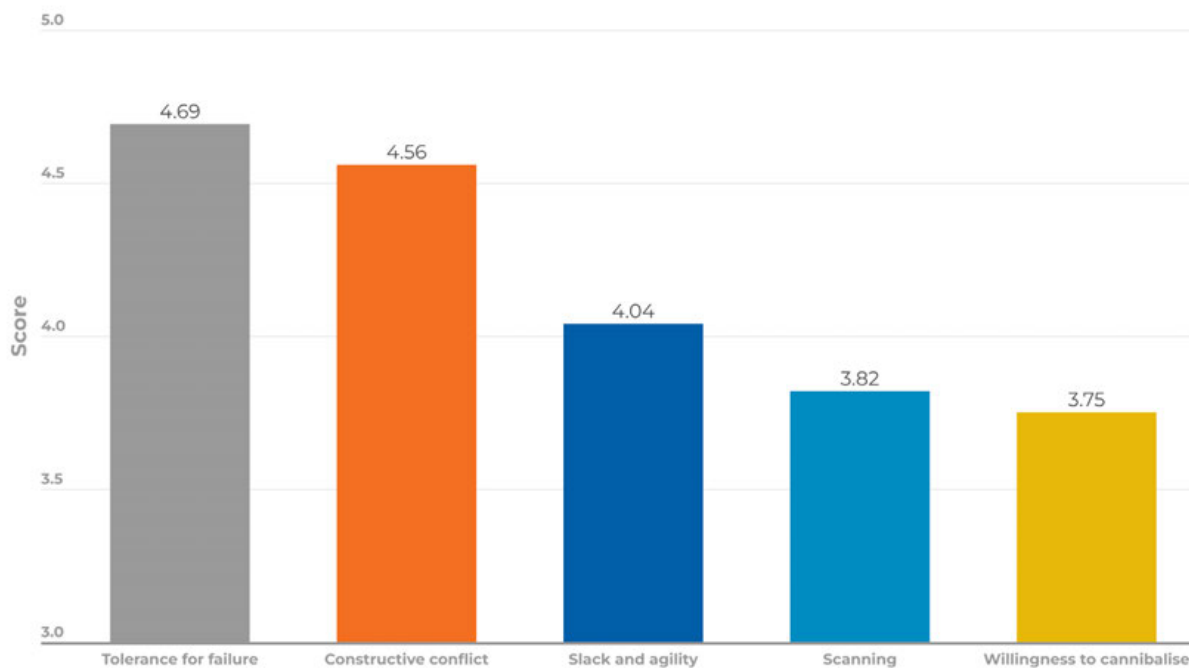
Australian businesses were relatively good at constructive conflict and tolerating failure (Figure 11), but relatively poor at willingness to cannibalise, scanning and slack & agility.

- 89 per cent of firms agreed or strongly agreed their business understood that learning from failure is a necessary part of success.
- Only 57 per cent of firms were very willing to sacrifice sales of existing products to improve sales of new products.
- Only 42 per cent of firms agreed they had extensive and highly effective engagement with researchers at universities.

FIGURE 11

Firms scored highly on constructive conflict and tolerance for failure

Average Enabler scores



Source: Dynamic capabilities survey, CEDA

Slack & agility was the enabler with the strongest relationship to dynamic capabilities.

This is about firms having access to labour and financial resources that are not tied up in “business as usual” to build competencies and pursue longer-term opportunities as they arise. Slack & agility is an important enabler for all three capabilities, but particularly for transforming.

Yet businesses are under pressure and spare capacity is hard to come by. The ABS innovation survey found lack of access to funds and skills are the most significant barriers to innovation.²⁴ GHD’s Innovation Imperative survey found that globally, business leaders see a lack of investment resources and lack of skills/capabilities as the biggest barriers to their innovation priorities over the next few years.²⁵ There is strong and consistent anecdotal evidence about burnout and a lack of bandwidth among businesses of all sizes post-COVID-19.

We asked about the availability of resources for growth or exploration projects. Firms were more comfortable about being able to access finance than workers. This is perhaps unsurprising given the low cost and high availability of finance and government support during the pandemic, which enabled businesses to build a substantial savings buffer.

Interest rates have risen significantly since then, and finances are also under pressure from high inflation. There is also a tight labour market and broad-based skills shortages. On top of this is a growing regulatory burden, which takes

FIGURE 12

Slack & agility is particularly important

Impact of a one point increase in enabler score on dynamic capabilities scores.



OLS regression coefficients; see appendix for full regression results. Enablers and capabilities are all measured on a scale of 1 to 6.

Source: Dynamic Capabilities Survey, CEDA • Created with Datawrapper

*"To be successful over the long run, firms need to run their core business while simultaneously **planning and positioning** for the **future**. Currently, firms are so tied up with the former that they are neglecting the latter."*

increasing amounts of time and effort away from long-term value-building activities.

This is not to say that large amounts of idle capacity would be good for the economy. The scarring effects of economic downturns and recessions, and the detrimental effects of long-term unemployment are clear. Tight labour markets can encourage firms to pay higher wages and introduce labour-saving productivity improvements. What the survey shows us is that running businesses lean to the bone is not a recipe for long-term success.

To be successful over the long run, firms need to run their core business while simultaneously planning and positioning for the future. Currently, firms are so tied up with the former that they are neglecting the latter. If this continues, there will be negative consequences for Australia's innovation and productivity growth well into the future.

On other enablers:

Being **willing to cannibalise**, or to scale up new areas of the business at the expense of existing sources of revenue, is particularly important for seizing new opportunities. Experts agree this is where a lot of firms fall short.²⁶ Our results confirm this is very difficult for businesses to do.

Scanning the environment is particularly important for identifying new opportunities and threats. The weakest score in the scanning category was on effective engagement with researchers at universities. There has been a lot of focus on the relationship between businesses and universities in recent years, particularly through the Federal Government's University Research Commercialisation Action Plan. Previous CEDA research identified collaboration between industry, academia and government as a key barrier to unlocking our innovation potential.²⁷ Our results support this ambition.

Tolerance for failure is important for transforming capabilities. Firms scored relatively highly on this enabler, which is at odds with the common narrative of a growing culture of risk aversion among Australian businesses.²⁸ At face value, this result suggests that risk aversion is not currently our biggest impediment, at least from a dynamic capabilities perspective.



Alternatively, this score could reflect the high proportion of CEOs and other senior leaders who answered the survey. Previous research has found that CEOs tend to be relatively risk-neutral, while middle managers tend to demonstrate extreme loss aversion even in relation to relatively small investments.²⁹ These inconsistencies in risk choices can be large, with the result that companies are foregoing smart investments and leaving significant value on the table.³⁰

Firms with more educated leaders tend to have stronger ordinary capabilities.³¹ **But the link between education and dynamic capabilities is less clear.** Dynamic capabilities ‘must be built because they cannot be bought’.³² They are partially embedded in a firm’s culture and history, strategy and processes. This makes them difficult to imitate or replicate from one business to another.

We were unable to test the relationship between dynamic capabilities and education due to a lack of variation in our sample – more than 80 per cent of firms had a principal manager with a bachelor’s degree or higher and only 8 per cent had an education level of year 12 or below.

It seems likely, however, that current education offerings have limited direct benefits for building dynamic capabilities. Dynamic capabilities are a relatively new area of research. Business schools and MBAs typically focus on ordinary capabilities, and therefore have limited value for business leaders looking for ways to boost dynamic capabilities. Cost-benefit analysis and other traditional financial analysis tools focus on efficiency rather than innovation, and are not useful in a deeply uncertain environment (where probabilities cannot be assigned to potential outcomes).³³

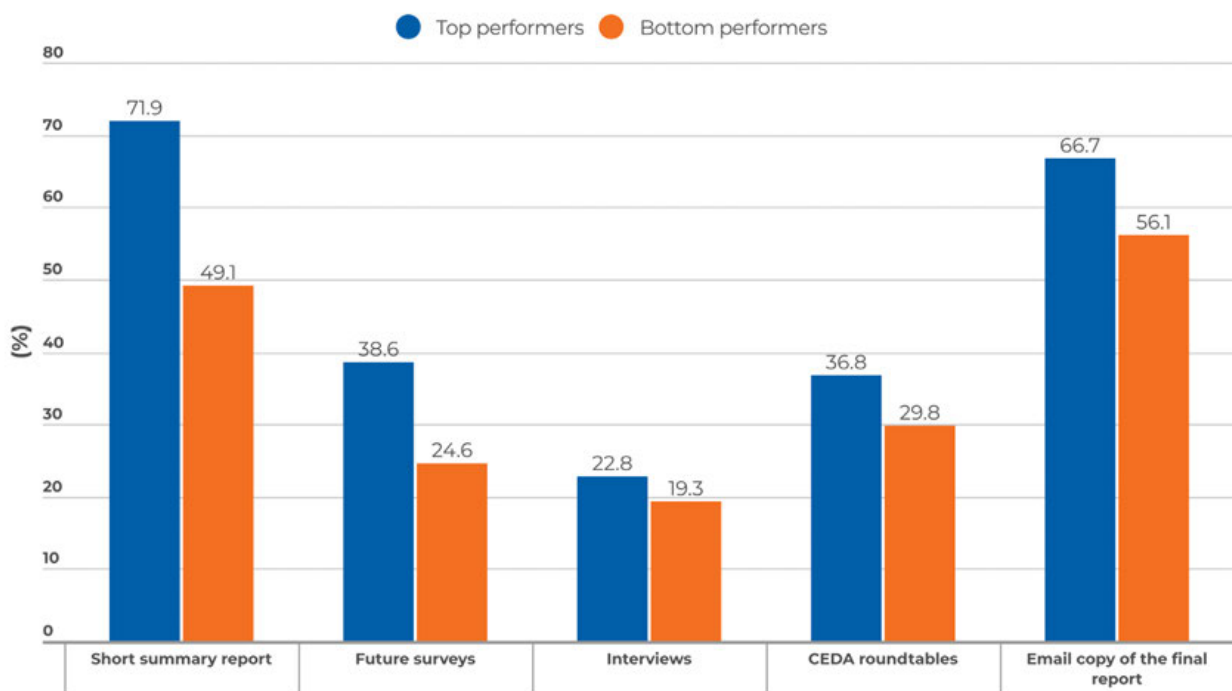
Instead, new micro-credential programs could help to kickstart dynamic capability building. Over time, more business schools should include these capabilities as part of their curriculums. Eventually, they could be a useful “overarching paradigm” for teaching in business schools.³⁴ Australia could also learn from capability-building programs in other countries, in particular the frontier firms training program in New Zealand.

Managers from high capability firms were more engaged with feedback than managers from low capability firms. More than 70 per cent of managers from high capability firms requested a short report comparing their business to the overall results, compared with only 50 per cent of managers from low capability firms (Figure 13).

FIGURE 13

Firms with stronger dynamic capabilities are more engaged with feedback

Per cent of respondents requesting feedback



Source: Dynamic capabilities survey, CEDA

"More than
70%

of managers from high capability firms requested a short report comparing their business to the overall results, compared with only 50 per cent of managers from low capability firms."

"In theory, firms with stronger dynamic capabilities are more resilient and better equipped to identify and respond to competitive threats."

Managers of high capability firms were also more interested in all other forms of feedback and engagement offered in the survey. On average, they ticked 2.4 feedback boxes each, compared with 1.8 for managers of low capability firms. These results are consistent with evidence from the UK that better-managed (and more productive) businesses are more engaged with feedback.³⁵ Firms with greater interest and insight into their own capabilities are more likely to improve. This is particularly important given that managers are typically unaware of their own firm's capabilities or how to improve them.³⁶

The survey did not find any difference in the average dynamic capabilities of internationally exposed versus domestic firms. Firms that are foreign-owned, are part of a multinational company, or who export or import all had similar scores to firms that are domestically owned or operated.

While foreign exposure is a driver of ordinary capabilities,³⁷ helping firms to adopt best practice and move closer to the productivity frontier, this result suggests that dynamic capabilities are developed through different channels. International exposure of the firm is not a necessary condition for fostering dynamic capabilities. In contrast, having leaders who can bring international *experience* to the boardroom can make a difference – see Finding 4 on board diversity.

We did not find any evidence of a clear relationship between dynamic capabilities and firm age or the level of competition a business faces. This is likely due to a lack of variation among the firms surveyed.ⁱ Young firms are key drivers of employment growth in the economy, and robotic surgical training firm IMRA (Case study 1) demonstrates that they can be very dynamic.

Competition is also likely to be very important. In theory, firms with stronger dynamic capabilities are more resilient and better equipped to identify and respond to competitive threats. Other researchers have found that the effects of dynamic capabilities depend on how well they fit the competitive environment in which firms operate.³⁸

ⁱ Firms in the sample tended to be older and well established – the average firm was 36 years old and only one firm was less than a year old. Similarly, almost three quarters of firms had '10 or more' competitors, which limits the variation – and therefore usefulness – of the competition measure captured in the survey.

4. Diversity matters for dynamism

Greater diversity within firms can help foster dynamic capabilities. Leaders' experience is instrumental in setting firm strategy, structure and processes, which are all crucial for providing an environment in which dynamic capabilities are developed and maintained.³⁹

We found that **firms with stronger dynamic capabilities had more diverse boards.**

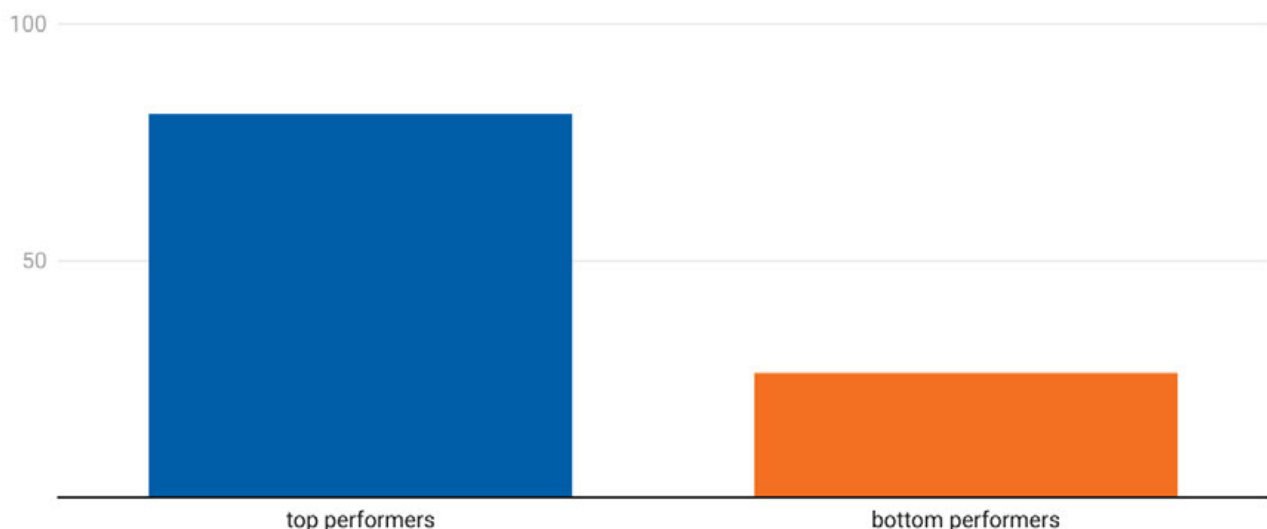
Specifically, 81 per cent of top performing companies with a board had at least one director that was female, at least one that had science and technology expertise and at least one with international experience, compared with just 26 per cent of the weakest firms (Figure 14).

All three of these categories of diversity (female, science/technology experience and international experience) were related to a company's sensing abilities. Having gender and professional diversity on their board was also related to a company's ability to transform.

FIGURE 14

Firms with stronger dynamic capabilities have more diverse boards

Per cent of firms with at least one director who is female, has science/technology/engineering expertise, and has international experience.



Source: Dynamic Capabilities Survey, CEDA • Created with Datawrapper



"In Australia, around 40 per cent of board directors have financial or legal experience, compared with just seven per cent having technology experience."

While company boards are becoming more gender diverse, there is much less emphasis on functional or professional diversity. Yet this may be more critical for driving innovation. A lack of such diversity "limits the board's ability to sense and evaluate new opportunities in deep uncertainty".⁴⁰

In Australia, around 40 per cent of board directors have financial or legal experience, compared with just seven per cent having technology experience.⁴¹ In New Zealand, Teece & Brown (2020) have emphasised the need for directors with strategy, technology and international experience to complement traditional, compliance-oriented professions such as legal and accounting.⁴² In the UK, a study of FTSE350 firms also found that more functionally diverse boards are better equipped to deal with deep uncertainty and complexity.⁴³

Enhancing diversity can therefore bring quick wins for Australian firms. Deeper cross-border business networks and international mentoring programs could also play a role.⁴⁴ Boosting STEM knowledge is also crucial for decision-making in an increasingly complex digital world.⁴⁵ Firms may be able to do this in creative ways, including by recruiting across industries or hiring external expertise, rather than increasing headcount.

Attracting both skilled migrants and talented expats back to Australia can be a strategic way to supplement domestic capabilities. From a productivity and innovation perspective, the skills and experience that these people bring are invaluable.⁴⁶

The migration system review and the Federal Government's response to date have recognised that the system needs to change if we are to attract the best global talent that will ultimately assist in growing Australia's pool of dynamic managers. As CEDA has previously recommended, key to this is the implementation of a three-tiered temporary skilled migration system to provide a fast track for highly skilled executives. It will also be important to pursue reforms to permanent migration that have been suggested by the review, as CEDA research has found that one quarter of permanent skilled migrants are working in roles beneath their skill level.⁴⁷



Increased regulatory burdens, personal liability obligations and public scrutiny are taking up vital bandwidth and making it harder than ever for boards to devote time to supporting innovation and building long-term competitive advantage. In a CSIRO survey more than half of surveyed board members admitted that innovation has never, or only rarely, been a board agenda item.⁴⁸ Yet this is exactly what is currently needed to lift Australia's productivity.

It is important that new regulations are well designed and well targeted, otherwise they simply add to the growing burden on businesses, particularly small- and medium-sized businesses. The opportunity cost of this is too great in the current environment. Now more than ever, business leaders need support from regulators and investors to better balance their focus between short-term profitability and risk mitigation, and long-term strategy and innovation.



5. Areas with strong capabilities partly reflect economies of scale and Australia's narrow industrial base

Both small and large businesses are vital to Australia's economic success. Most businesses in the Australian economy are small-to-medium-sized enterprises (SMEs), making them the drivers of employment and productivity growth, while larger firms have a bigger impact on business investment. Dynamic capabilities are relevant to firms of all sizes, though particularly when management is shared across a team.⁴⁹

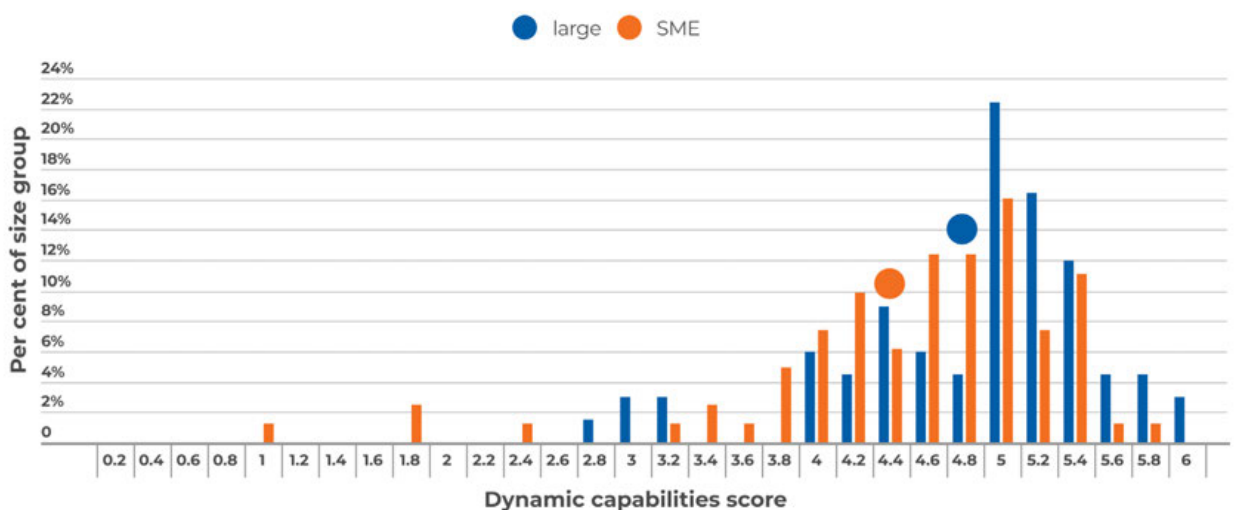
On average, larger businesses (with at least 200 full-time equivalent employees) had stronger dynamic capabilities than SMEs (average score of 4.8 versus 4.4).ⁱⁱ Similarly, national firms (operating across all states and territories) scored higher than firms operating in a single state or territory (4.8 versus 4.5).

Small- and medium-sized firms had significantly lower average scores for both sensing and transforming than their larger counterparts. This may reflect that they are more resource constrained, as evidenced by relatively low scores for the slack & agility and scanning enablers.

FIGURE 15

Large firms have stronger average capabilities than smaller firms

Distribution of dynamic capabilities scores by size



Source: Dynamic capabilities survey, CEDA

Per cent of firms in each size category

Average score

ii Almost 55 per cent of firms in the sample are SMEs, while the rest are large firms with 200 or more employees.

SMEs often have trouble accessing finance in particular, especially for riskier, longer-term investments that would be transforming.

While SMEs had lower average scores, not all had weak capabilities. The laggards in our sample were SMEs, but many also had strong capabilities – 40 per cent scored above the median (compared with two-thirds of large firms).

FIGURE 16

Larger firms have stronger dynamic capabilities

Average dynamic capabilities scores by firm size

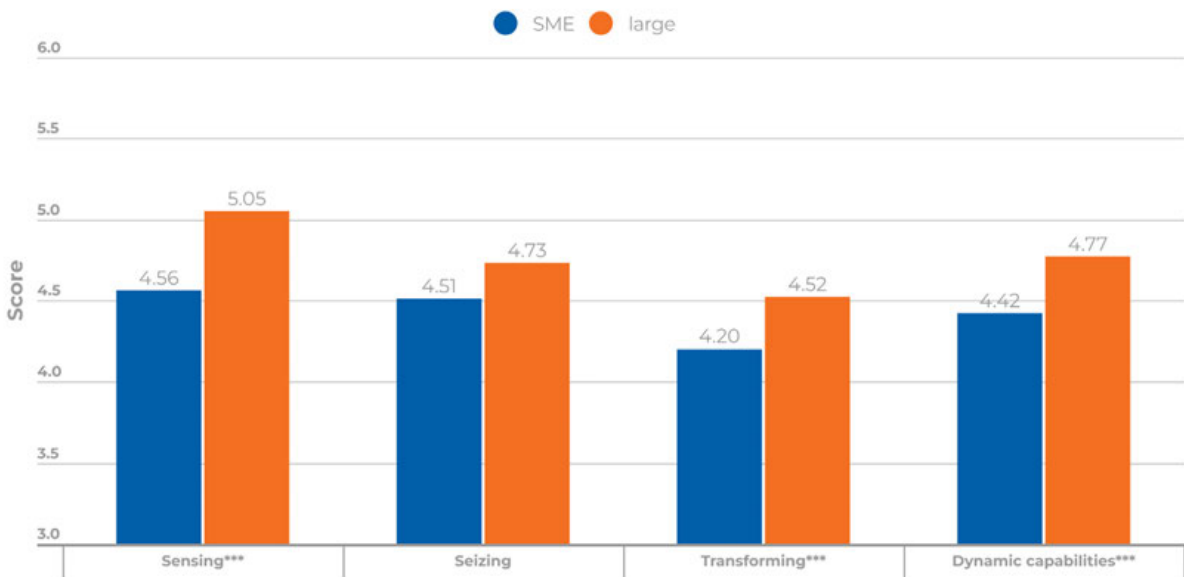
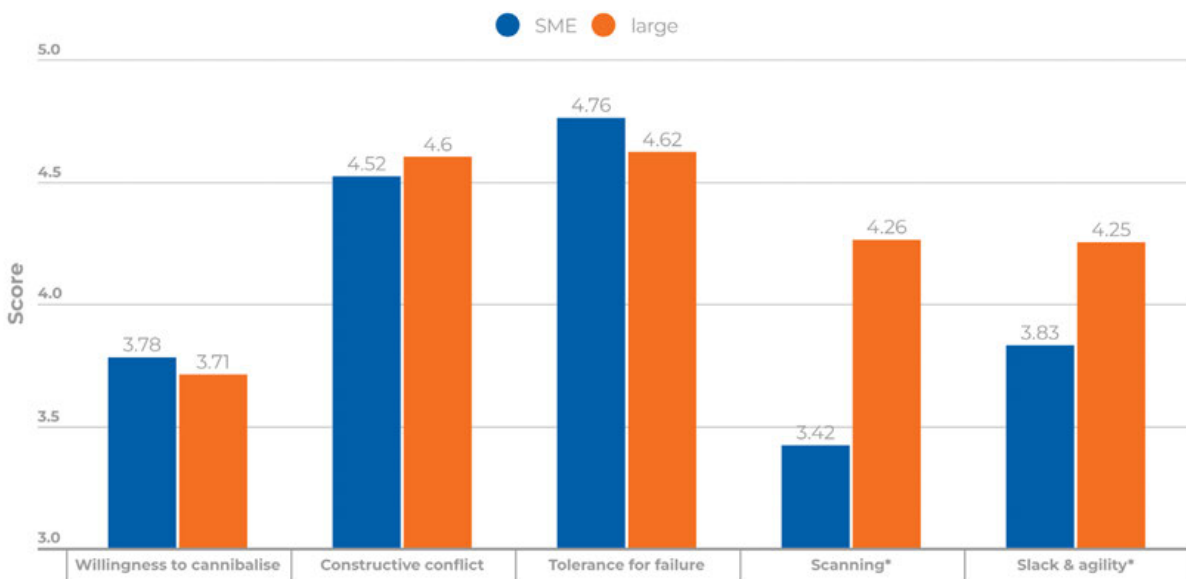


FIGURE 17

SMEs have less slack than larger firms

Average enabler scores by firm size



Source: Dynamic capabilities survey, CEDA

* indicates the difference between average scores for large firms versus SMEs is significant at the 10% level.

Small- and medium-sized firms are a diverse group. Many are family-owned businesses operating in traditional industries and not focusing on growth. At the other end of the spectrum, as Case study 1 demonstrates, many – particularly high-growth start-ups – are very agile and have strong dynamic capabilities.

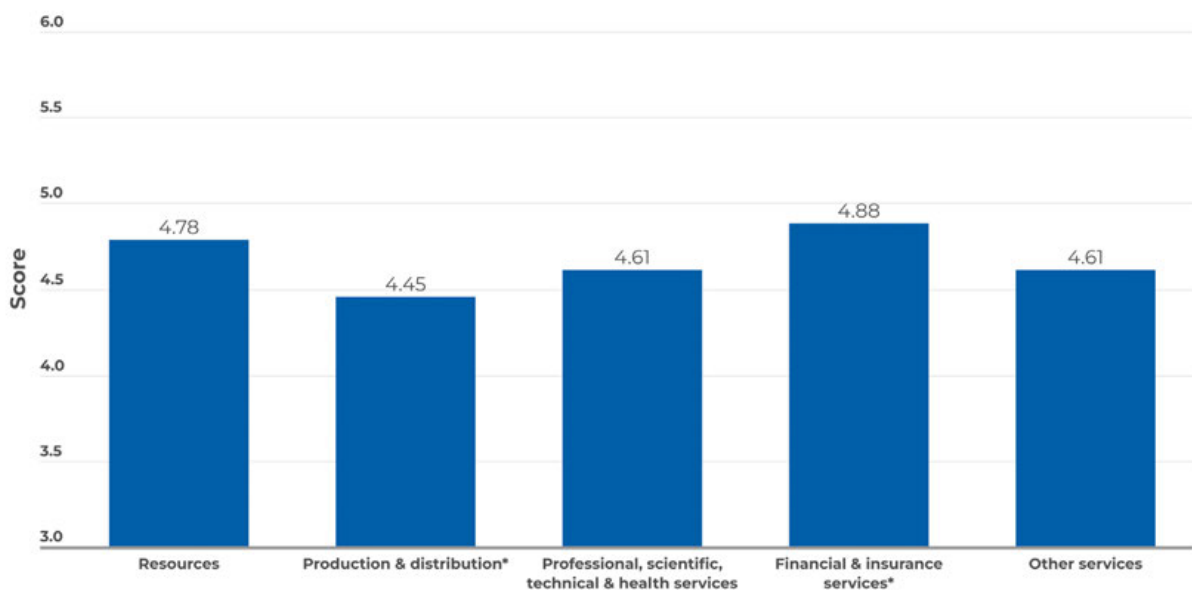
The industries with the highest average scores were finance & insurance services and mining (Figure 18). This is consistent with Australian research on ordinary capabilities in which finance & insurance services and mining were among the industries with the highest share of firms in the top level of strategic management.⁵⁰

In contrast, **the weakest average score was for the production & distribution industry group**, which includes manufacturing; construction; transport, postal & warehousing; wholesale trade and retail trade. Again, this is broadly consistent with the Australian research on ordinary capabilities showing manufacturing, construction, and transport, postal & warehousing were among the lowest tiers of strategic management capability.⁵¹

FIGURE 18

Financial & insurance services firms have stronger dynamic capabilities

Average dynamic capability scores by industry group



Source: Dynamic capabilities survey, CEDA

Resources includes agriculture, forestry & fishing and mining.

Production & distribution includes manufacturing; construction; transport, postal & warehousing; wholesale trade and retail trade.

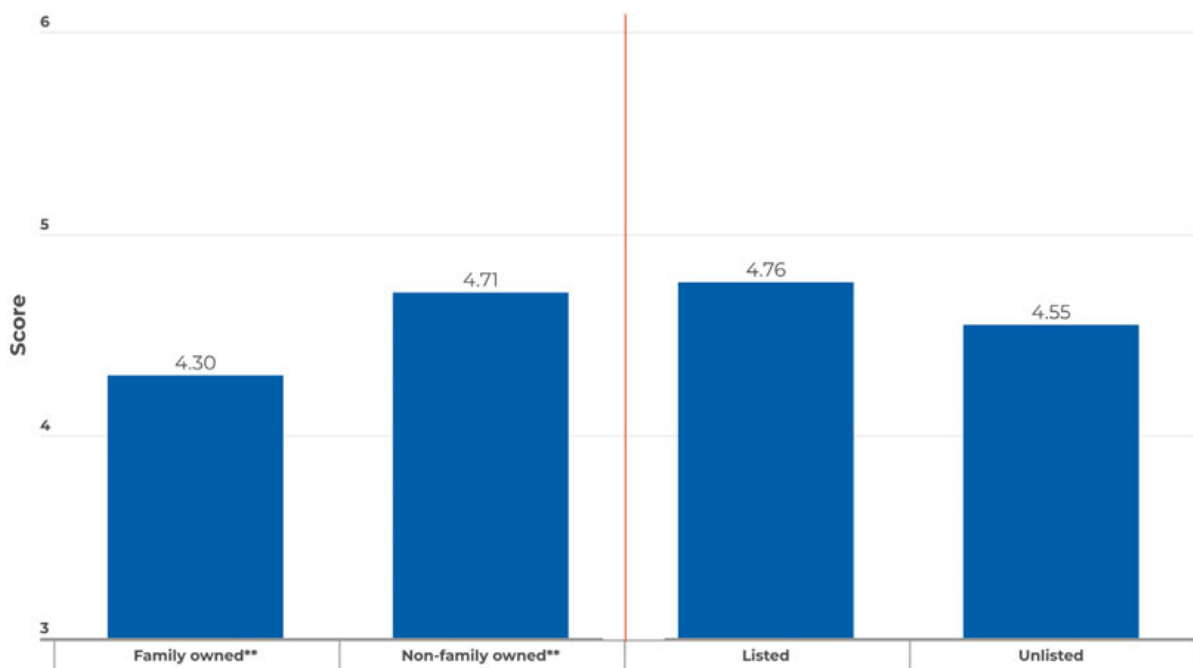
Difference between categories with * is statistically significant at the 10% level.

Family-owned businesses have weaker dynamic capabilities than businesses with other ownership structures (Figure 19). This is consistent with Australian research on ordinary capabilities, which also found that family-owned businesses have weaker capabilities.⁵² Publicly listed companies had a slightly higher average score than unlisted firms on our survey, but the difference was not statistically significant.

FIGURE 19

Family-owned firms have weaker dynamic capabilities

Average dynamic capabilities scores by ownership status



Source: Dynamic capabilities survey, CEDA

Difference between categories with ** is statistically significant at the 5% level.

“

"Family-owned businesses have weaker dynamic capabilities than businesses with other ownership structures."

CASE STUDY 1

International Medical Robotics Academy

“You don’t need to do it all on your own”

International Medical Robotics Academy (IMRA) was founded in 2021. The start-up’s vision is to drive widespread use of advanced robotic surgical procedures and synthetic training products to increase patient safety and ethical training for doctors and lower costs for healthcare systems.

IMRA provides in-person, online and virtual reality training for complex robotic surgical procedures. More recently, it has developed and is starting to manufacture and export advanced synthetic human tissue models for trainee surgeons. IMRA is now doing advanced manufacturing in both Victoria and New South Wales.

This is a good example of all three dynamic capabilities sensing, seizing and transforming in action, in particular, IMRA scored very high on seizing capabilities in the survey.

- The company’s founder, surgeon Professor Tony Costello, **sensed** there was an unmet need for this product as standard methods of training on animals, cadavers or real patients, are increasingly viewed as unethical. There was an opportunity for an alternative that was both ethical and cost effective.
- IMRA was able to **seize** this opportunity through collaboration and partnerships with a range of stakeholders. IMRA’s strong sense of purpose, the importance placed on continuous learning and values of diversity and providing opportunity, have all been key ingredients to its success.
- The company was solely focused on providing robotic surgery training but **transformed** to take advantage of the new manufacturing opportunity. The firm’s clear mission and sense of purpose gave it the confidence to dedicate resources to product development and manufacturing.

IMRA has just 18 staff. A key ingredient to its rapid success has been not trying to do everything itself.

“You don’t need to do it all on your own,” says IMRA Chief Executive Adam Clark.

“For start-ups, the biggest killer is your cash burn rate and the amount of time it takes to get things done. If you try to do it all yourself it can take a really long time because there is so much to learn, and the learning process is slow and expensive.”

Instead, IMRA has developed partnerships with experts in science and surgery. It uses consultants or subcontractors in areas such as logistics and marketing.

Staff have a strong sense of purpose and believe in the company’s mission to improve ethical and safety standards in surgery. They meet regularly to reflect on and learn from their experience.

Diversity and inclusion are also key. In addition to expertise in science, engineering and medical devices, the firm has staff with backgrounds in the military, environmental science, archaeology and the film industry. IMRA is also not afraid to provide younger staff with opportunities. Its chief hydrogel scientist is in her mid-20s.

Board members also have experience in areas ranging from surgery and law to banking, construction and artificial intelligence.

CASE STUDY 2

Google

A capabilities journey in reverse

Global tech business Google performed extremely highly on all three areas of sensing, seizing and transforming in the survey. From day one, Google has recruited staff with strong ordinary and dynamic capabilities. It prioritised dynamic individuals early on and fostered specific ordinary capabilities later as the business grew.

- As a technology business, Google can access a lot of real-time data for **sensing**. This is aided by the fact that most of its revenue comes from advertising, helping it to understand its customer base. During the COVID-19 pandemic, it used this data to help other businesses and governments understand how people's behaviour was changing, such as providing reports on mobility and health-related search terms.
- The 2015 restructure of the business into the Alphabet holding company has helped Google strengthen its capacity for **seizing**. Google is also driving many technological changes that create new markets. For example, while it conducted much of the foundational research on Artificial Intelligence (AI), Google is now facing as much disruption from AI as other businesses, given the recent tectonic shifts in the technology.
- The establishment of Alphabet was also an example of Google's ability to **transform**. This restructure created separate units that report individually. Being smaller, these units often have a sharper focus and are more agile, especially if allowed to succeed or fail on their own merits.

Google has demonstrated that dynamic capabilities do not always follow the standard sequence of sensing, then seizing and finally transforming. Instead, it has created feedback loops between capabilities. For example, Google seizes opportunities by making internal technological innovations. It then considers how to make money from them, rather than the standard process of sensing customer demand for a product as a first step.

Since its inception, Google has aimed to take advantage of spare capacity to drive innovation, while also being accepting of failure, says Google's Public Policy and Government Affairs Manager, Alex Lynch.

"Everyone aims to use 20 per cent of their time on a passion project that is meaningful to the company ... this is how Gmail started out, and now it's a multibillion user product," Mr Lynch said.

But over time, Google has had to strike a balance between fostering autonomous units and establishing a centralised bureaucracy that can empower and help these smaller units to make better decisions.

Key to its success has been having a data-centric culture and the willingness to respond to data-driven insights.

Key lessons

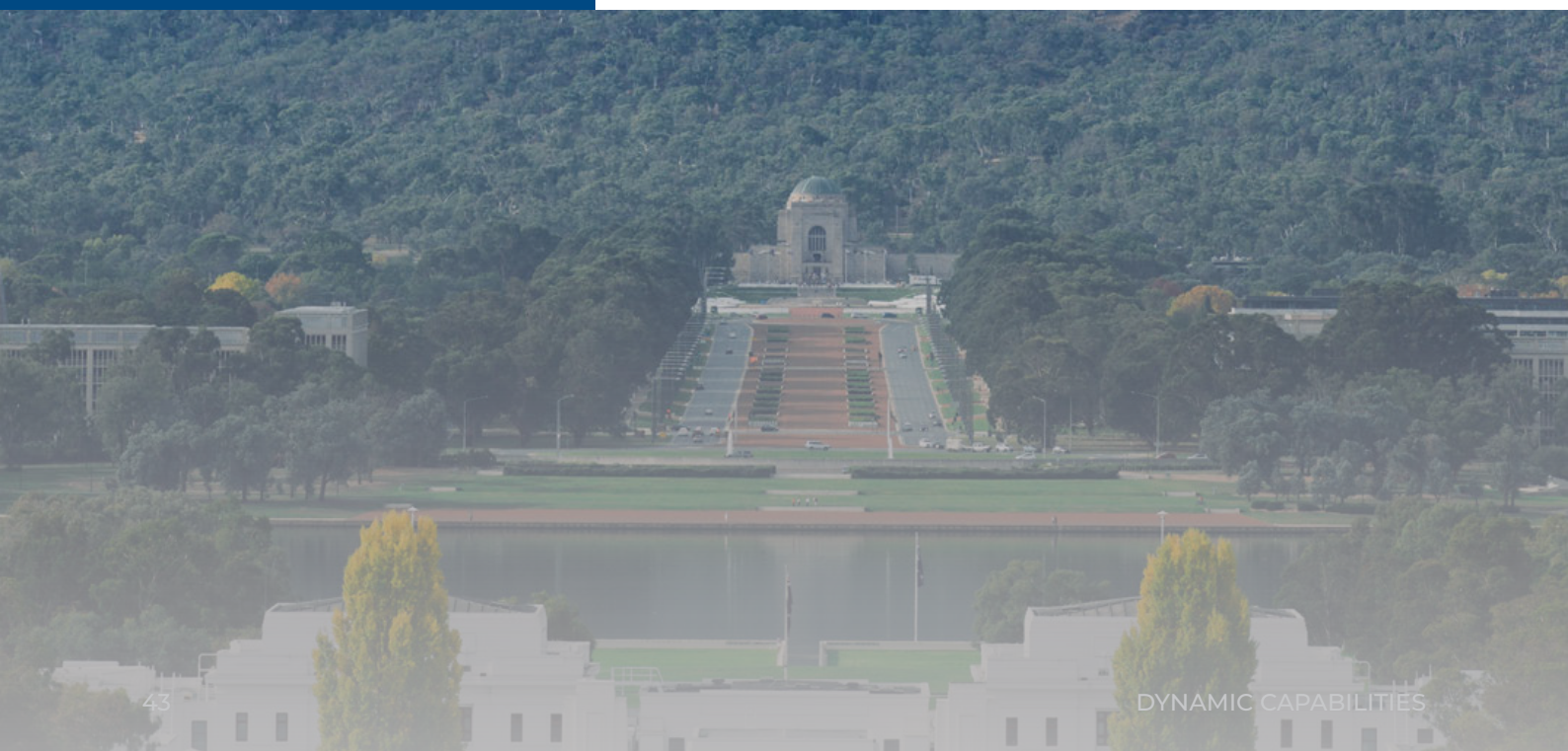
For business leaders

1. Dynamic capabilities help companies perform better in uncertain environments. Business leaders need to be open to feedback and understand their firm's capabilities, where they are lacking and how to improve.
2. Businesses must build their dynamic capabilities, including through education and training. New micro-credential programs could help in the short term. Over time, more business schools should teach dynamic capabilities.
3. More firms need to prioritise innovation over efficiency. To do this, businesses need to find the people, time and money to build their capabilities, take advantage of new opportunities and position for the future.
4. Australian businesses must get better at transforming. Leaders need to embrace renewal and change and take smart risks in the face of uncertainty.
5. We need more diverse leadership at executive and board level.



For governments

1. Innovation policy should encourage businesses to build dynamic capabilities. For example, Australia should learn from overseas programs such as the frontier firms training program in New Zealand.
2. Onerous compliance regimes can hinder the development of dynamic capabilities. While regulations are important, governments should ensure they are well-designed and that the level of burden they're imposing does not stifle innovation, especially for small businesses.
3. Attracting both skilled migrants and talented expats back to Australia can strengthen domestic capabilities. The Federal Government should provide a fast-track visa for highly skilled executives, as CEDA has previously recommended.
4. Governments will need to adopt dynamic capabilities in the delivery of services such as aged care, disability services and welfare as they increasingly face similar demands as for-profit businesses amid rapid digital transformation, rising community expectations and funding pressures.
5. Building dynamic capabilities is an investment in resilience in the economy. Dynamic firms are adaptable and can navigate unexpected events with minimal disruption, reducing the need for crisis management.



Conclusion and future work

Australia has a long and enviable history of economic prosperity and high living standards. We must boost productivity, innovation and resilience amid increasing uncertainty to ensure this continues.

Despite rising interest rates, a tight labour market and chronic skills shortages, businesses must prioritise dynamism. Building dynamic capabilities at the heart of each Australian business, in particular, improving their ability to transform, could be one of the most practical and effective ways of ensuring our continued economic success.

This survey has significantly advanced our understanding of the dynamic capabilities of Australian businesses. The results have also revealed key opportunities for future work.

In particular, while this initial study identified links between enablers, dynamic capabilities and firm performance, we intend to undertake more sophisticated statistical analysis to better understand how enablers help businesses develop their capabilities, and how these capabilities improve a company's performance.

It is hard to draw many conclusions at the industry level from this survey, which has breadth but not depth across industries. Deeper dives into particular industries is another area for future work. In particular, we hope to conduct deeper analysis of the dynamic capabilities of the care economy and the public sector – which were beyond the scope of our survey. These sectors are under increasing pressure to deliver better customer outcomes amid growing community expectations, an ageing population and funding and productivity challenges.

More must be done to find practical ways to boost the dynamic capabilities of Australian businesses. We must learn from capability-building programs overseas and case studies of best practice, and work to develop more micro-credential programs in this area.

Appendix 1: Survey details

Survey design

CEDA, alongside experts from UTS, designed this survey drawing heavily on existing, already-validated surveys in the literature. The questions were tested and refined based on feedback from select CEDA members with relevant business and research experience, in particular members of the CEDA Business Dynamism & Competitiveness Member Advisory Committee and the CEDA Research & Policy Committee.

Survey measures, despite their limitations, are the most direct way of assessing capabilities and therefore play a key role in dynamic capability research.⁵³ Self-reported measures that ask respondents to rate their firm's competences relative to competitors are well-accepted in the literature.⁵⁴

The survey questions were organised into seven broad categories:

1. Screening

The first questions in the survey were designed to ensure that the businesses responding were for-profit entities operating in Australia. Respondents were unable to proceed any further if they did not satisfy these criteria. (The survey began asking for businesses with a minimum of 50 full-time equivalent employees, but this criterion was subsequently dropped, and the survey opened up to businesses of all sizes.)

2. Dynamic capabilities

The dynamic capabilities framework of 'sensing, seizing and transforming', first conceptualised by David Teece, is now widely used in the strategic management literature.

There is currently no single, broadly accepted measure of dynamic capabilities. The dynamic capabilities questions in the survey were based on Kump et al (2019) (the 'Kump scale').⁵⁵

The Kump scale is a 14-item scale measuring dynamic capabilities at the firm level using David Teece's well-established dynamic capability framework. It was developed based on a comprehensive review of the dynamic capabilities literature and existing dynamic capabilities scales published up to January 2018, using a rigorous empirical scale-development procedure. The Kump scale focuses on outcomes, rather than frequencies, of dynamic capabilities activities. It shows high reliability and validity and has also been shown to be a good predictor of business and innovation performance.

Respondents were asked to rank their business across 14 items (5 for sensing, 4 for seizing, 5 for transforming) on a 6-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. Changes were made to the wording of some items, based on feedback, to maximise the clarity and relevance of each item.

3. Enablers

Questions about potential enablers of dynamic capabilities were adapted from the 'organisational antecedents' in Danneels (2008).⁵⁶ This includes questions about cultural, structural and other business-specific factors that might enable or encourage the development of dynamic capabilities within an organisation. As these enablers are to some extent within managerial control, this suggests that managers can use these levers to increase their firm's ability to develop new capabilities.

Many of the questions covered areas that were identified in CEDA roundtables and other preliminary scoping work as potentially important drivers of business dynamism. Some items were edited, deleted or added to the original Danneels (2008) scale based on this scoping work and other feedback.

The 21 items in this category were grouped into five broad characteristics (i) willingness to cannibalise, (ii) constructive conflict, (iii) tolerance for failure, (iv) scanning and (v) slack and agility. Respondents were asked to rank their business on each item on a 6-point Likert scale ranging from 'strongly disagree' to 'strongly agree'.

BOX 3

Enablers⁵⁷		
Category	Description	Example survey item
Willingness to cannibalise	Willingness to cannibalise reflects an organisational culture that recognises that pursuing new opportunities may involve shifting the focus from current resources to new ones, even if this means sacrificing current sources of profit. This process of 'internal creative destruction' involves letting go of routines and assets associated with past, rather than future, success.	We support projects even if they could potentially take away sales from existing products.
Constructive conflict	Constructive conflict involves the rigorous debate of ideas, beliefs and assumptions within a firm. It provides 'psychological safety', where debate is focused on challenging issues and ideas, rather than people. This facilitates a richer discussion and more careful consideration of available options.	In our business serious consideration is given to alternative viewpoints and ideas.
Tolerance for failure	Firms that are more tolerant of failure see failure as an inevitable, and even beneficial, consequence of exploration. In failure-tolerant firms, advocates of failed projects do not carry the entire burden of failure and do not become scapegoats. This creates a culture where employees are more likely to feel emboldened to propose and explore new ideas.	In our business it is understood that learning from failure is a necessary part of success.
Scanning	Scanning involves monitoring and analysing the environment for opportunities in new markets and new technologies. Scanning can increase firm knowledge, identify new opportunities and allow the firm to enter new domains.	We have extensive and highly effective engagement with researchers at universities.
Slack and agility	Slack resources are labour and financial resources that are not taken up by 'business as usual'. Firms with slack and agility are better able to build competencies, explore and exploit longer-term opportunities than more resource-constrained firms.	We have sufficient discretionary financial resources or can raise funds if required.

4. Business performance

The business performance questions were adapted from Kump et al (2019).⁵⁸ Respondents were asked to rate the performance of their business on 18 dimensions under the categories of customer-related performance, financial performance, employee-related performance, domestic market performance and export market performance. These ratings were presented on a 5-point Likert scale ranging from 'decreased significantly' to 'increased significantly'. Our regression analysis used the average score in each of these categories.

The performance measures in the survey are self-assessed, but where possible we adapted the original questions to make them more objective. Kump et al (2019) points out that 'previous research has found high correlations between self-assessed and objective performance data'.⁵⁹ Analysis using more objective performance measures could nevertheless be a useful area for future work.

Business performance was measured over the COVID-19 pandemic. Dynamic capabilities are a useful framework to aid decision-making under deep uncertainty, which is amplified by events including pandemics and geopolitical rifts.⁶⁰ For example, there is evidence that firms with stronger dynamic capabilities were more resilient during the Global Financial Crisis.⁶¹

The business performance questions were asked for two time periods (i) pre-COVID to June 2020 and (ii) June 2020 to the time of completing the survey. This enabled us to examine business performance under both the immediate and more prolonged impact of the pandemic.

5. Innovation performance

Questions on innovation performance were drawn from the ABS Management Capabilities Module.⁶² Respondents were asked whether they had introduced any new or significantly improved (i) goods or services, (ii) operational processes, (iii) organisational or managerial processes and (iv) marketing methods over the same two periods as the business performance questions. A firm was classified as having undertaken innovation activity if it had engaged with any type of innovation during the period.

6. Business characteristics

The business characteristics questions were designed to identify what types of firms have better dynamic capabilities. The survey included questions about the firm's age, industry, states/territories of operation, ownership structure, international exposure, board of directors, number of competitors and education of the principal manager. Many of the questions were adapted from the ABS Management Capabilities Module.⁶³

7. Respondent characteristics and feedback

The final section of the survey asked about the respondent's level of seniority, years of experience in the business and industry and level of involvement in strategic decision-making. This ensures that the survey has collected high-quality responses from well-qualified individuals.

As an incentive to complete the survey, respondents could choose to receive a custom report outlining how their business compared to the aggregate results. They were also able to nominate to receive an email copy of the final report, and to participate in future surveys, interviews or CEDA roundtables on the topic of dynamic capabilities.

Survey implementation

The survey was conducted by CEDA via SurveyMonkey.

It was promoted through multiple channels, including the CEDA membership base, broader CEDA network, LinkedIn posts and paid advertising, and advertising through business membership organisations. Participants were also encouraged to share more broadly with their own business networks, in line with the 'snowballing' sampling technique adopted by Kump et al (2019) and others.⁶⁴

The survey was launched in late 2021 and remained active for approximately 12 months.

Sample size

We collected 149 usable survey responses – that is, responses that had satisfied the screening criteria and completed the dynamic capabilities questions as a minimum. See Appendix 4 for detailed characteristics of businesses and respondents. We anonymised all responses before conducting any data analysis.

Calculation of dynamic capability scores

We asked each respondent to rate their business on a scale from 1 to 6 across 14 dimensions within the categories of sensing, seizing and transforming. For each business, the sensing, seizing and transforming scores were calculated as the simple average of the items within each category. We then calculated the simple average of the three sensing, seizing and transforming scores to determine each business's overall dynamic capabilities score.

Appendix 2: Biases and limitations

The Kump survey on which ours is based has been rigorously tested and shows high reliability and validity.⁶⁵ Previous research also indicates that subjective performance measures can accurately reflect objective performance measures.⁶⁶

The survey was deliberately designed to minimise any bias in the results. To reduce the potential for social desirability bias, the introduction to the survey emphasised that all businesses do things differently and place emphasis on different capabilities, and respondents were explicitly instructed to reflect the actual situation in their firm (i.e. how things really are rather than how they wish they were).⁶⁷

Respondents could also choose to remain anonymous. On self-reporting bias, Danneels (2008) notes that self-reported measures of firms' competencies have become well accepted in the literature.⁶⁸ Similarly, we have endeavoured to reduce the impact of response fatigue by limiting the length of the survey and front-focusing the dynamic capabilities questions.

Self-selection bias will be investigated more fully in future analysis of early versus late respondents. Survivor bias is difficult to measure or mitigate but should also be acknowledged as a potential limitation.

Other limitations include the longer-than-expected timeframe for sample collection, and that much of our analysis is based on correlations or simple regression models. Further research will undertake more sophisticated structural equation modelling to help identify causal relationships.

The survey only captures dynamic capabilities at one point in time, and therefore can't offer any insights on how capabilities are built over time. Capturing and analysing dynamic capabilities over time could also be a fruitful avenue for future research.

Appendix 3: Regression results

Impact of dynamic capabilities on firm performanceⁱ

OLS regression analysis: Dynamic capabilities and performance

Performance category	First few months of COVID-19					Post June 2020				
	Customer performance	Financial performance	Employee-related performance	Domestic market performance	Export market performance	Customer performance	Financial performance	Employee-related performance	Domestic market performance	Export market performance
Dynamic capabilities	0.016 (0.048)	-0.056 (0.079)	0.125** (0.048)	-0.027 (0.065)	-0.020 (0.056)	0.219* (0.126)	0.286** (0.137)	0.307** (0.12)	0.140 (0.148)	0.085 (0.18)
Number of states	-0.012 (0.017)	0.009 (0.027)	-0.009 (0.014)	0.007 (0.023)	-0.029 (0.023)	-0.009 (0.022)	0.023 (0.024)	0.012 (0.019)	0.031 (0.026)	0.052 (0.049)
SME dummy	0.16 (0.117)	0.063 (0.174)	0.058 (0.089)	0.08 (0.155)	0.16 (0.167)	-0.15 (0.125)	-0.295* (0.175)	-0.076 (0.137)	-0.22 (0.156)	-0.072 (0.354)
Age (years)	0 (0.002)	0.001 (0.002)	0.001 (0.001)	-0.001 (0.002)	-0.004 (0.003)	0 (0.002)	0.001 (0.002)	-0.001 (0.002)	-0.002 (0.002)	-0.001 (0.006)
Industry group dummy: primary industries	-0.07 (0.168)	-0.574** (0.265)	-0.092 (0.15)	-0.316 (0.213)	-0.579*** (0.208)	0.105 (0.154)	0.29 (0.27)	0.122 (0.221)	0.124 (0.231)	0.387 (0.308)
Industry group dummy: manufacturing	0.038 (0.095)	0.047 (0.154)	-0.075 (0.092)	-0.013 (0.121)	-0.184 (0.15)	-0.03 (0.143)	-0.157 (0.163)	-0.201 (0.122)	-0.171 (0.172)	0.341 (0.306)
Constant	2.994*** (0.241)	3.272*** (0.416)	2.601*** (0.248)	3.328*** (0.306)	3.231*** (0.285)	2.738*** (0.621)	2.657*** (0.66)	2.273*** (0.58)	3.275*** (0.72)	2.502** (1.034)
Observations	117	117	117	103	49	117	117	117	102	51
F-statistic	0.0	1.0	2.0	1.0	2.0	1.0	2.0	3.0	1.0	0.0
p-value	0.9	0.3	0.2	0.8	0.1	0.5	0.1	0.0	0.3	0.9
R-square	0.0	0.1	0.1	0	0.2	0.1	0.1	0.2	0.1	0.1
Loglikelihood	-74.7	-130.6	-60.7	-87.3	-28.2	-101.2	-127	-99.9	-101.9	-60.6

Asterisks denote significance at the * 10%, ** 5% and *** 1% levels

Standard errors in parentheses

Primary industries group includes mining and agriculture, forestry & fishing

Source: Dynamic Capabilities Survey, CEDA

ⁱ As a robustness check, ordered logistic regressions yielded similar results to ordinary least squares regressions.

OLS regression analysis: Sensing and performance

Performance category	First few months of COVID-19					Post June 2020				
	Customer performance	Financial performance	Employee-related performance	Domestic market performance	Export market performance	Customer performance	Financial performance	Employee-related performance	Domestic market performance	Export market performance
Sensing	0.024 (0.043)	-0.104 (0.067)	0.087** (0.043)	-0.042 (0.06)	-0.020 (0.056)	0.164 (0.116)	0.220* (0.124)	0.234** (0.111)	0.100 (0.139)	0.076 (0.161)
Number of states	-0.012 (0.017)	0.011 (0.027)	-0.008 (0.014)	0.007 (0.022)	-0.029 (0.023)	-0.008 (0.022)	0.024 (0.025)	0.014 (0.02)	0.033 (0.026)	0.052 (0.05)
SME dummy	0.158 (0.116)	0.073 (0.173)	0.056 (0.09)	0.086 (0.155)	0.16 (0.167)	-0.155 (0.126)	-0.302* (0.176)	-0.084 (0.142)	-0.219 (0.156)	-0.067 (0.355)
Age (years)	0 (0.002)	0.002 (0.002)	0.001 (0.001)	-0.001 (0.002)	-0.004 (0.003)	0 (0.002)	0.001 (0.002)	-0.001 (0.002)	-0.002 (0.002)	-0.001 (0.006)
Industry group dummy: primary industries	-0.071 (0.168)	-0.569** (0.258)	-0.083 (0.153)	-0.311 (0.208)	-0.579*** (0.208)	0.119 (0.153)	0.306 (0.259)	0.14 (0.226)	0.147 (0.233)	0.387 (0.306)
Industry group dummy: manufacturing	0.038 (0.096)	0.042 (0.156)	-0.082 (0.091)	-0.015 (0.121)	-0.184 (0.15)	-0.042 (0.141)	-0.171 (0.161)	-0.216* (0.121)	-0.175 (0.169)	0.337 (0.305)
Constant	2.963*** (0.231)	3.479*** (0.402)	2.762*** (0.222)	3.393*** (0.314)	3.231*** (0.285)	2.971*** (0.591)	2.935*** (0.621)	2.581*** (0.551)	3.430*** (0.707)	2.536** (0.987)
Observations	117	117	117	103	49	117	117	117	102	51
F-statistic	0.0	2.0	1.0	1.0	2.0	1.0	2.0	3.0	1.0	0.0
p-value	0.9	0.2	0.4	0.7	0.1	0.6	0.1	0.0	0.3	0.9
R-square	0.0	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.1
Loglikelihood	-74.7	-130.1	-61.8	-87.2	-28.2	-102.5	-128.3	-102.2	-102.3	-60.6

Asterisks denote significance at the * 10%, ** 5% and *** 1% levels

Standard errors in parentheses

Primary industries group includes mining and agriculture, forestry & fishing

Source: Dynamic Capabilities Survey, CEDA

OLS regression analysis: Seizing and performance

Performance category	First few months of COVID-19					Post June 2020				
	Customer performance	Financial performance	Employee-related performance	Domestic market performance	Export market performance	Customer performance	Financial performance	Employee-related performance	Domestic market performance	Export market performance
Seizing	0.003 (0.042)	-0.068 (0.07)	0.039 (0.044)	-0.028 (0.053)	-0.002 (0.048)	0.173 (0.107)	0.236** (0.115)	0.208** (0.103)	0.109 (0.125)	0.046 (0.15)
Number of states	-0.011 (0.017)	0.01 (0.027)	-0.007 (0.013)	0.008 (0.023)	-0.029 (0.023)	-0.009 (0.022)	0.022 (0.024)	0.014 (0.02)	0.03 (0.026)	0.053 (0.049)
SME dummy	0.162 (0.118)	0.055 (0.174)	0.071 (0.092)	0.077 (0.155)	0.154 (0.164)	-0.124 (0.128)	-0.259 (0.173)	-0.04 (0.138)	-0.2 (0.157)	-0.06 (0.356)
Age (years)	0 (0.002)	0.001 (0.002)	0.001 (0.002)	-0.001 (0.002)	-0.004 (0.003)	0 (0.002)	0.002 (0.002)	0 (0.002)	-0.002 (0.002)	-0.001 (0.006)
Industry group dummy: primary industries	-0.068 (0.17)	-0.573** (0.266)	-0.077 (0.16)	-0.316 (0.217)	-0.587*** (0.212)	0.115 (0.16)	0.301 (0.252)	0.14 (0.239)	0.143 (0.231)	0.394 (0.301)
Industry group dummy: manufacturing	0.036 (0.096)	0.04 (0.152)	-0.084 (0.091)	-0.015 (0.121)	-0.188 (0.147)	-0.023 (0.147)	-0.146 (0.171)	-0.199 (0.127)	-0.17 (0.175)	0.35 (0.312)
Constant	3.052*** (0.248)	3.344*** (0.415)	2.960*** (0.238)	3.342*** (0.286)	3.157*** (0.26)	2.885*** (0.574)	2.805*** (0.619)	2.635*** (0.544)	3.380*** (0.67)	2.660*** (0.975)
Observations	117	117	117	103	49	117	117	117	102	51
F-statistic	0.0	1.0	1.0	1.0	2.0	1.0	2.0	2.0	1.0	0.0
p-value	0.9	0.2	0.7	0.7	0.1	0.5	0.1	0.0	0.3	0.9
R-square	0.0	0.1	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.1
Loglikelihood	-74.8	-130.5	-63.1	-87.3	-28.3	-101.9	-127.5	-103.1	-102.1	-60.7

Asterisks denote significance at the * 10%, ** 5% and *** 1% levels

Standard errors in parentheses

Primary industries group includes mining and agriculture, forestry & fishing

Source: Dynamic Capabilities Survey, CEDA

OLS regression analysis: Transforming and performance

Performance category	First few months of COVID-19					Post June 2020				
	Customer performance	Financial performance	Employee-related performance	Domestic market performance	Export market performance	Customer performance	Financial performance	Employee-related performance	Domestic market performance	Export market performance
Transforming	0.011 (0.04)	0.033 (0.079)	0.139*** (0.05)	0.008 (0.072)	0.089 (0.092)	0.144 (0.088)	0.175* (0.093)	0.228** (0.096)	0.092 (0.1)	0.082 (0.155)
Number of states	-0.011 (0.017)	0.006 (0.027)	-0.008 (0.013)	0.006 (0.023)	-0.029 (0.023)	-0.005 (0.022)	0.029 (0.025)	0.018 (0.02)	0.034 (0.026)	0.054 (0.049)
SME dummy	0.16 (0.118)	0.052 (0.174)	0.047 (0.087)	0.074 (0.156)	0.11 (0.174)	-0.153 (0.13)	-0.296 (0.18)	-0.084 (0.143)	-0.217 (0.158)	-0.084 (0.358)
Age (years)	0 (0.002)	0.001 (0.002)	0.001 (0.001)	-0.001 (0.002)	-0.003 (0.003)	0 (0.002)	0.001 (0.002)	0 (0.002)	-0.002 (0.002)	-0.001 (0.006)
Industry group dummy: primary industries	-0.07 (0.167)	-0.590** (0.27)	-0.099 (0.145)	-0.332 (0.213)	-0.625*** (0.216)	0.112 (0.152)	0.301 (0.269)	0.126 (0.222)	0.136 (0.227)	0.388 (0.311)
Industry group dummy: manufacturing	0.036 (0.095)	0.057 (0.154)	-0.081 (0.091)	-0.01 (0.123)	-0.205 (0.149)	-0.049 (0.143)	-0.183 (0.161)	-0.225* (0.123)	-0.181 (0.171)	0.335 (0.305)
Constant	3.022*** (0.194)	2.899*** (0.385)	2.586*** (0.248)	3.188*** (0.321)	2.794*** (0.38)	3.104*** (0.465)	3.188*** (0.468)	2.684*** (0.46)	3.502*** (0.51)	2.540*** (0.865)
Observations	117	117	117	103	49	117	117	117	102	51
F-statistic	0.0	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	0.0
p-value	0.9	0.2	0.1	0.8	0.1	0.5	0.1	0.0	0.3	0.9
R-square	0.0	0.1	0.1	0.0	0.3	0.1	0.1	0.2	0.1	0.1
Loglikelihood	-74.7	-130.7	-58.2	-87.4	-27.6	-102.6	-129	-101.2	-102.2	-60.6

Asterisks denote significance at the * 10%, ** 5% and *** 1% levels

Standard errors in parentheses

Primary industries group includes mining and agriculture, forestry & fishing

Source: Dynamic Capabilities Survey, CEDA

Impact of dynamic capabilities on firm innovation

Logit regression analysis: Dynamic capabilities and innovation

Type of innovation	First few months of COVID-19				Post June 2020			
	Operational processes	Organisational/ managerial	Marketing methods	Goods or services	Operational processes	Organisational/ managerial	Marketing methods	Goods or services
Dynamic capabilities	0.478 (0.298)	0.712** (0.314)	0.820** (0.413)	0.372 (0.288)	0.316 (0.357)	0.228 (0.454)	0.600** (0.288)	0.328 (0.279)
Number of states	0.067 (0.076)	0.03 (0.084)	0.155* (0.087)	0.016 (0.079)	0.159 (0.099)	-0.06 (0.132)	0.151* (0.083)	0.152* (0.09)
SME dummy	0.304 (0.503)	0.291 (0.521)	0.138 (0.511)	-0.012 (0.488)	-0.205 (0.581)	1.238 (1.032)	0.279 (0.491)	-0.76 (0.567)
Age (years)	0.001 (0.008)	0.003 (0.009)	-0.004 (0.007)	-0.009 (0.007)	-0.008 (0.01)	-0.014 (0.011)	-0.011* (0.007)	-0.013* (0.007)
Industry group dummy: primary industries	1.247 (0.91)	-1.684* (0.946)	-0.482 (0.934)	-1.142 (0.797)	1.016 (1.179)	0 (.)	-0.151 (0.697)	-1.862*** (0.641)
Industry group dummy: manufacturing	0.661 (0.491)	0.238 (0.494)	0.11 (0.517)	0.717 (0.465)	0.128 (0.605)	0.212 (0.754)	0.328 (0.479)	-0.237 (0.536)
Constant	-3.179** (1.477)	-3.787** (1.489)	-5.388*** (1.942)	-1.726 (1.346)	0.068 (1.802)	-0.133 (2.598)	-2.856** (1.45)	0.599 (1.453)
Observations	104	102	108	108	117	105	117	116
Loglikelihood	-68	-65	-61	-70	-50	-38	-71	-64
Chi-squared	7.1	9.8	11.4	10	3.6	1.9	10.3	15.8
p-value	0.3	0.1	0.1	0.1	0.7	0.9	0.1	0.0

Asterisks denote significance at the * 10%, ** 5% and *** 1% levels

Standard errors in parentheses

Primary industries group includes mining and agriculture, forestry & fishing

Source: Dynamic Capabilities Survey, CEDA

Logit regression analysis: Sensing and innovation

Type of innovation	First few months of COVID-19				Post June 2020			
	Operational processes	Organisational/ managerial	Marketing methods	Goods or services	Operational processes	Organisational/ managerial	Marketing methods	Goods or services
Sensing	0.495* (0.277)	0.624** (0.271)	0.479* (0.284)	0.198 (0.256)	0.199 (0.339)	0.283 (0.431)	0.241 (0.238)	0.128 (0.266)
Number of states	0.062 (0.078)	0.03 (0.082)	0.158* (0.089)	0.018 (0.078)	0.159 (0.098)	-0.066 (0.136)	0.156* (0.08)	0.154* (0.088)
SME dummy	0.269 (0.504)	0.249 (0.511)	0.186 (0.512)	0.01 (0.483)	-0.201 (0.578)	1.218 (1.029)	0.28 (0.488)	-0.733 (0.562)
Age (years)	0.001 (0.007)	0.002 (0.009)	-0.005 (0.007)	-0.009 (0.007)	-0.008 (0.01)	-0.015 (0.011)	-0.011 (0.007)	-0.013* (0.007)
Industry group dummy: primary industries	1.29 (0.917)	-1.692* (1.001)	-0.405 (0.956)	-1.103 (0.815)	1.02 (1.162)	0 (.)	-0.099 (0.699)	-1.797*** (0.645)
Industry group dummy: manufacturing	0.641 (0.484)	0.194 (0.48)	0.095 (0.51)	0.685 (0.458)	0.099 (0.594)	0.197 (0.72)	0.243 (0.46)	-0.27 (0.528)
Constant	-3.272** (1.384)	-3.419** (1.328)	-3.958*** (1.528)	-1.005 (1.251)	0.549 (1.771)	-0.36 (2.466)	-1.293 (1.195)	1.431 (1.438)
Observations	104	102	108	108	117	105	117	116
Loglikelihood	-67	-65	-62	-71	-50	-38	-72	-64
Chi-squared	7.8	8.8	9.5	8	3.7	2	7.8	15.1
p-value	0.3	0.2	0.1	0.2	0.7	0.9	0.3	0.0

Asterisks denote significance at the * 10%, ** 5% and *** 1% levels

Standard errors in parentheses

Primary industries group includes mining and agriculture, forestry & fishing

Source: Dynamic Capabilities Survey, CEDA

Logit regression analysis: Seizing and innovation

Type of innovation	First few months of COVID-19				Post June 2020			
	Operational processes	Organisational/ managerial	Marketing methods	Goods or services	Operational processes	Organisational/ managerial	Marketing methods	Goods or services
Seizing	0.116 (0.24)	0.400* (0.241)	0.409 (0.287)	0.126 (0.241)	0.249 (0.298)	0.424 (0.32)	0.632** (0.256)	0.253 (0.251)
Number of states	0.073 (0.075)	0.032 (0.081)	0.158* (0.089)	0.022 (0.079)	0.157 (0.098)	-0.073 (0.134)	0.149* (0.083)	0.151* (0.09)
SME dummy	0.392 (0.497)	0.427 (0.507)	0.25 (0.528)	0.045 (0.479)	-0.152 (0.581)	1.308 (1.089)	0.372 (0.488)	-0.709 (0.563)
Age (years)	0.002 (0.008)	0.004 (0.009)	-0.003 (0.007)	-0.008 (0.008)	-0.007 (0.01)	-0.014 (0.011)	-0.011 (0.007)	-0.013* (0.007)
Industry group dummy: primary industries	1.31 (0.959)	-1.505* (0.908)	-0.394 (0.906)	-1.099 (0.824)	1.008 (1.159)	0 (.)	-0.155 (0.701)	-1.831*** (0.64)
Industry group dummy: manufacturing	0.618 (0.485)	0.234 (0.489)	0.084 (0.518)	0.686 (0.465)	0.146 (0.614)	0.31 (0.787)	0.4 (0.496)	-0.223 (0.547)
Constant	-1.677 (1.294)	-2.597** (1.28)	-3.707** (1.55)	-0.726 (1.26)	0.26 (1.658)	-1.099 (2.124)	-3.202** (1.414)	0.839 (1.468)
Observations	104	102	108	108	117	105	117	116
Loglikelihood	-69	-66	-63	-71	-50	-37	-70	-64
Chi-squared	5.1	7.8	9.4	7.3	3.7	3.1	12.7	16.2
p-value	0.5	0.3	0.2	0.3	0.7	0.7	0.0	0.0

Asterisks denote significance at the * 10%, ** 5% and *** 1% levels

Standard errors in parentheses

Primary industries group includes mining and agriculture, forestry & fishing

Source: Dynamic Capabilities Survey, CEDA

Logit regression analysis: Transforming and innovation

Type of innovation	First few months of COVID-19				Post June 2020			
	Operational processes	Organisational/ managerial	Marketing methods	Goods or services	Operational processes	Organisational/ managerial	Marketing methods	Goods or services
Transforming	0.444* (0.244)	0.478* (0.26)	0.772** (0.343)	0.457* (0.253)	0.244 (0.303)	-0.238 (0.394)	0.420* (0.241)	0.315 (0.225)
Number of states	0.076 (0.076)	0.04 (0.082)	0.173** (0.087)	0.02 (0.08)	0.164 (0.101)	-0.049 (0.128)	0.161* (0.082)	0.159* (0.091)
SME dummy	0.271 (0.505)	0.295 (0.52)	0.062 (0.524)	-0.081 (0.491)	-0.207 (0.587)	1.311 (0.957)	0.266 (0.491)	-0.786 (0.574)
Age (years)	0.002 (0.008)	0.004 (0.009)	-0.004 (0.007)	-0.008 (0.007)	-0.008 (0.01)	-0.013 (0.011)	-0.011 (0.007)	-0.013* (0.007)
Industry group dummy: primary industries	1.226 (0.92)	-1.589* (0.95)	-0.457 (0.903)	-1.184 (0.778)	1.021 (1.179)	0 (.)	-0.147 (0.684)	-1.891*** (0.635)
Industry group dummy: manufacturing	0.62 (0.491)	0.179 (0.49)	0.054 (0.52)	0.703 (0.474)	0.11 (0.603)	0.13 (0.729)	0.27 (0.48)	-0.252 (0.537)
Constant	-2.900** (1.268)	-2.640** (1.275)	-4.965*** (1.618)	-1.913 (1.19)	0.444 (1.482)	1.785 (2.23)	-1.948 (1.235)	0.761 (1.184)
Observations	104	102	108	108	117	105	117	116
Loglikelihood	-67	-65	-60	-69	-50	-38	-71	-64
Chi-squared	7.5	7.4	11.6	12.7	3.6	3.6	8.8	16
p-value	0.3	0.3	0.1	0.0	0.7	0.6	0.2	0.0

Asterisks denote significance at the * 10%, ** 5% and *** 1% levels

Standard errors in parentheses

Primary industries group includes mining and agriculture, forestry & fishing

Source: Dynamic Capabilities Survey, CEDA

Impact of enablers on dynamic capabilitiesⁱ

OLS Regression Analysis: Enablers and Dynamic Capabilities

Enablers and control variables	Dynamic capabilities	Sensing	Seizing	Transforming
Willingness to cannibalise	0.136** (0.057)	0.087 (0.087)	0.256*** (0.079)	0.066 (0.077)
Constructive conflict	0.195*** (0.069)	0.161 (0.11)	0.172** (0.084)	0.252*** (0.085)
Tolerance of failure	0.141* (0.073)	0.126 (0.13)	0.084 (0.087)	0.214*** (0.075)
Scanning	0.092** (0.043)	0.174*** (0.059)	0.122** (0.06)	-0.02 (0.076)
Slack & agility	0.228*** (0.051)	0.172** (0.08)	0.202*** (0.066)	0.311*** (0.081)
Number of states	0.003 (0.015)	0.007 (0.02)	0.013 (0.019)	-0.01 (0.023)
SME dummy	0.103 (0.094)	0.103 (0.148)	-0.025 (0.116)	0.231 (0.149)
Age (years)	0.001 (0.001)	0.003 (0.002)	-0.001 (0.002)	0 (0.002)
Industry group dummy: primary industries	0.121 (0.141)	0.049 (0.198)	0.066 (0.13)	0.249 (0.218)
Industry group dummy: manufacturing	0.15 (0.092)	0.139 (0.13)	0.113 (0.138)	0.197 (0.136)
Constant	1.048***	1.493***	1.258***	0.394
Observations	-0.3	-0.496	-0.37	-0.443
F-statistic	117	117	117	117
p-value	24	8	18	11
R-square	0	0	0	0
Loglikelihood	0.7	0.5	0.6	0.5
Chi-squared	-58.2	-102.7	-90.6	-106.6

Asterisks denote significance at the * 10%, ** 5% and *** 1% levels

Standard errors in parentheses

Primary industries group includes mining and agriculture, forestry & fishing

Source: Dynamic Capabilities Survey, CEDA

ⁱ As a robustness check, ordered logistic regressions yielded similar results to ordinary least squares regressions.

Appendix 4: Sample characteristics

BUSINESS CHARACTERISTICS

Age (years)		count	per cent
up to 10		20	13.4
10 to 20		26	17.4
20 to 30		24	16.1
30 to 40		11	7.4
40 to 50		12	8.1
50 to 60		4	2.7
60 to 70		5	3.4
70 to 80		2	1.3
80 to 90		5	3.4
90 or more		9	6.0
unknown		31	20.8
Total		149	100.0
Average age (yrs)		36	

Size: number of FTE employees		count		per cent	
		pre-covid	current	pre-covid	current
Less than 5		5	2	3.4	1.3
5 to 19		24	28	16.1	18.8
20 to 49		15	15	10.1	10.1
50 to 99		14	13	9.4	8.7
100 to 149		12	17	8.1	11.4
150 to 199		4	6	2.7	4.0
200 to 299		5	5	3.4	3.4
300 to 399		4	5	2.7	3.4
400 to 499		6	3	4.0	2.0
500 or more		49	54	32.9	36.2
unknown		11	1	7.4	0.7
Total		149	149	100.0	100.0
<20	Small	29	30	19.5	20.1
20 to 199	Medium	45	51	30.2	34.2
200 or more	Large	64	67	43.0	45.0
	unknown	11	1	7.4	0.7
	Total	149	149	100.0	100.0

Size: revenue	count		<i>per cent</i>	
	pre-covid	current	<i>pre-covid</i>	<i>current</i>
Less than \$2m	13	11	8.7	7.4
\$2m to less than \$5m	17	10	11.4	6.7
\$5m to less than \$10m	13	14	8.7	9.4
\$10m to less than \$50m	23	33	15.4	22.1
\$50m to less than \$500m	30	26	20.1	17.4
\$500m or more	42	44	28.2	29.5
unknown	11	11	7.4	7.4
Total	149	149	100.0	100.0

Industry	count	<i>per cent</i>
Agriculture, Forestry and Fishing	2	1.3
Mining	10	6.7
Manufacturing	16	10.7
Electricity, gas, water and waste services	4	2.7
Construction	9	6.0
Wholesale trade	1	0.7
Retail trade	5	3.4
Accommodation and food services	4	2.7
Transport, postal and warehousing	2	1.3
Information media and telecommunications	2	1.3
Financial and insurance services	14	9.4
Rental, hiring and real estate services	3	2.0
Professional, scientific and technical services	23	15.4
Administrative and support services	1	0.7
Education and training	2	1.3
Health care and social assistance	9	6.0
Arts and recreation services	0	0.0
Other services	12	8.1
Unknown	30	20.1
Total	149	100.0

State	count	per cent
ACT	53	35.6
NSW	76	51.0
NT	45	30.2
Qld	72	48.3
SA	62	41.6
Tas	44	29.5
Vic	77	51.7
WA	79	53.0

** Firms can operate across multiple states and territories*

Ownership structure	count	per cent
Listed	37	24.8
Unlisted	82	55.0
Unknown	30	20.1
Total	149	100.0
Founder	12	8.1
Family owned with family CEO	24	16.1
Family owned with external CEO	3	2.0
Private individuals	23	15.4
Managers	3	2.0
Dispersed shareholders	28	18.8
Government	5	3.4
Other	21	14.1
Unknown	42	28.2
Total	149	100.0

International exposure	count	per cent
Foreign multinational	35	23.5
Australian multinational	16	10.7
Domestic business	68	45.6
Unknown	30	20.1
Total	149	100.0
Less than 5% (domestically owned)	57	38.3
5% to 49% (minority foreign-owned)	14	9.4
50% to 95% (majority foreign-owned)	9	6.0
Greater than 95% (wholly foreign-owned)	21	14.1
Unknown	48	32.2
Total	149	100.0
export	23	15.4
import	13	8.7
domestic	106	71.1
unknown	30	20.1
Total	149	100.0

** Firms can operate across multiple markets*

Education level of principal manager	count	per cent
Bachelor's degree or higher	98	65.8
Advanced diploma or diploma	9	6.0
Certificate III or IV (including trade certificate)	2	1.3
Year 12 or equivalent	7	4.7
Year 11 or below	3	2.0
Did not go to school	0	0.0
Unknown	30	20.1
Total	149	100.0

RESPONDENT CHARACTERISTICS*

Respondent position	count	<i>per cent</i>
CEO or equivalent	35	30.7
Other senior exec or LT member	63	55.3
Board member	7	6.1
Non-leadership position	9	7.9
Total	114	100.0

Respondent tenure in the business	count	<i>per cent</i>
Less than 1 year	10	8.8
1 year or more	104	91.2
Total	114	100.0

Average tenure (yrs) **11.2**

Respondent tenure in the industry	count	<i>per cent</i>
Less than 1 year	4	3.5
1 year or more	110	96.5
Total	114	100.0

Average tenure (yrs) **17.9**

Respondent involvement in strategic decision-making	count	<i>per cent</i>
Very low involvement	1	0.9
Low involvement	9	7.9
Average involvement	14	12.3
High involvement	38	33.3
Very high involvement	52	45.6
Total	114	100.0

* Not all respondents completed this part of the survey

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