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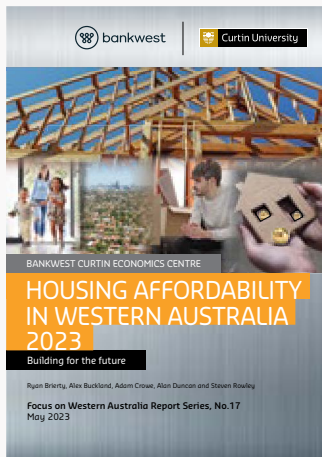
DARE TO VENTURE

Startups and the innovation ecosystem
in Western Australia

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FOREWORD



A strong innovation ecosystem is an important driver of employment, productivity and economic growth. A more innovative society supports diversification, social wellbeing and the liveability of a location. Startups are more likely to emerge and succeed when the ecosystem is well developed.

As such, the startup sector has links to numerous Western Australian government strategies that speak to industry diversification, STEM skills, regional economic development and population growth.

The WA government's Innovation Strategy lays out a 10-year plan for the state to reposition itself as a thriving and innovative place in which to live, work, visit and do business. The strategy speaks to the drive for skills and talent, research and technology transfer, access to capital, and innovation precincts.

There is a need to better understand the startup and innovation ecosystem in WA, towards informing policies that help to support entrepreneurship and startups, thus curating an innovation ecosystem within which startups can thrive.

This research program highlights the geographical location of startups in WA and the sectoral concentration of startups relative to other states and territories across Australia.

Startups do not emerge in a vacuum. A novel entrepreneurial ecosystem index lays out the ten key elements of WA's ecosystem relative to other national jurisdictions and points to elements where the state is falling behind.

Economic modelling highlights key factors that influence startup success such as access to grants, seed and venture capital funding.

The report looks at gender disparities to better understand the underrepresented nature of female entrepreneurs and how the gap can be closed.

Recommendations for governments, businesses and key players in the ecosystem are provided to help mitigate fragmentation and deliver a startup environment that is recognised globally.

It is important that the trajectory of the startup ecosystem is tracked over time. Evaluating both the collective and individual efforts made by firms, industry and government is required to ensure that endeavours to diversify the WA economy and support startups in new and emerging industries maintain pace.

A stylized, handwritten signature in black ink.

Professor Alan Duncan
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EXECUTIVE SUMMARY

Startups play a crucial role in stimulating progress and prosperity. They contribute to economic growth and diversification through innovation, increased productivity, and job creation, and they improve social wellbeing and the liveability of a location.

This report aims to add to existing work on innovation and startups in WA to help better understand the innovation ecosystem, towards informing policies that help curate an innovation ecosystem within which startups can thrive.

The number of operating startups in WA saw tremendous growth in the years prior to the COVID-19 pandemic. Based on Dealroom data, there are 1,020 startups in WA, accounting for 9.8 per cent of the national count. The size of WA's startup labour force is relatively small, with a high of 9,650 startup workers as of 2024. There are just six startup workers per 1,000 employed persons in WA, compared to 14.5 per 1,000 employed persons in NSW.

This report shows that the relative density of WA's startups is strong in sectors such as minerals, mining, oil and gas, and energy.

But relative to other states and territories, WA's strengths are heavily concentrated in a very narrow pool of industry sectors.

WA is missing out on the opportunities emerging in new industry sectors. This is particularly evident in areas such as artificial intelligence, data and analytics, and information technology, as well as FinTech, professional services, biotechnology and health related sectors.

If WA continues to rely on its traditional strengths without focusing on emerging sectors, it risks falling further behind in industries that can expand economic growth, employment and prosperity. WA needs to diversify and find ways to support a more diversified economy.

To this end, WA's entrepreneurial ecosystem needs to be enhanced. New firms do not emerge in a vacuum. Their creation depends heavily on the resources and conditions available to entrepreneurs in specific locations. The importance of a strong innovation ecosystem is well recognised by industry and government, with numerous government strategies seeking to develop key elements of the innovation ecosystem.

The Bankwest Curtin Economics Centre quantifies the ten key elements of Australia's entrepreneurial ecosystem at a small (SA2) geographical area level. The index generated reveals a significant contrast between metropolitan and regional areas, but also within metropolitan regions. Agglomeration and scale matter.

Greater Perth ranks fifth nationally in the entrepreneurial ecosystem index, with Sydney, Melbourne, Brisbane and Adelaide sitting in the top four, respectively. Greater Perth falls behind on nine of the ten elements, namely: formal institutions, entrepreneurship culture, networks, physical infrastructure, access to finance, leadership, talent, new knowledge, and intermediate services. Greater Perth sits slightly above the national average for demand, with a high gross state product per capita a factor at play.

Some areas in Perth compare favourably on the national front. Inner Perth (SA4) ranks third nationally, with six of the ten elements on par or above those reported for equivalent inner Sydney and inner Melbourne regions. Inner Perth's ecosystem falls behind on new knowledge, talent, physical infrastructure and leadership.

Improvements to the ecosystem will lead to a greater number of startups in WA. Scenario modelling shows that, if inner Perth's ecosystem aligned with the national average, an additional 350 new startups in WA could be created. This is a 35 per cent increase on current levels. These additional startups would further expand employment opportunities resulting in the direct employment of 3,500 highly skilled persons. This would also generate spillover employment to other supporting industries and provide benefits to agents across the ecosystem.

But achieving such targets requires focused and targeted policy and industry involvement. An additional 8,000 individuals pursuing tertiary qualifications, 1,600 additional individuals with leadership qualities and a \$440 million increase in R&D expenditure by business is required to achieve these outcomes.

This report investigates the key drivers for startup success, defined here as an exit via initial public offering (IPO) or acquisition. The results show that a \$100,000 increase in grants funding increases the probability of success by 1.9 percentage points.

Startups where founders have previous entrepreneurial experience tend to have about a 5.8 percentage points higher chance of success compared to those without previous experience.

And the age of the startup predicts a positive probability of success. Specifically, an additional year on the age of a startup is associated with an increase in the chance of success by about 7.9 percentage points.

Access to talent (measured as the proportion of persons with bachelor's degree and above) also significantly promotes startup success.

And finally, this report looks at factors explaining gender disparities in startup success. Male founders have a 53 per cent chance of successful exit through acquisition or IPO compared to a 43 per cent success rate for females. Modelling shows that about 55 per cent of the gender gap is explained by the differences in characteristics and therefore can be reduced by addressing factors such as access to grants, participation in funding rounds and founder experience.

The results from the modelling offer important policy implications for government and policymakers responsible for the development of a vibrant startup ecosystem that will eventually boost productivity, jobs and economic growth.

It is crucial that policymakers devise strategies to improve talent and skills in the startup and innovation ecosystem. Access to grants and early-stage funding schemes need certainty in provision and need to be at scale. And further supports to address gender disparities are required.

Progress towards building 'Brand WA' as a place to live, work and invest needs to continue. Developing the innovation ecosystem further is critical to deliver on a more diversified and resilient WA economy.

Key Insights

State of Play

- Startups often aim to introduce something new to the market. They show potential for large revenue scalability over a short period of time.
- Based on Dealroom data, there are 1,020 startups in WA, accounting for 9.8% of the national count.
- The number of operating startups in WA saw tremendous growth in the years prior to the COVID-19 pandemic.
- Roughly 28,000 Australians worked in startups in 2018, peaking at 155,000 in 2024.
- The size of WA's startup labour force is relatively small, with a high of 9,650 startup workers as of 2024.
- There are just six startup workers per 1,000 employed persons in WA, compared to 14.5 per 1,000 employed persons in NSW.
- The 'Venture Capital Winter' relates to a large decline in venture capital funding across the globe on the back of the COVID-19 pandemic, with inflationary pressures, higher interest rates and economic uncertainty having an impact on investor confidence.
- Most startup founders tend to be males, and in turn, most funding goes to startups founded by men.
- Agglomeration effects are critical for startups to emerge and thrive. By region, the majority of WA's startups are founded in Perth.

A need to diversify

- The density of startups in WA with primary business activities in natural resources, energy and manufacturing is high relative to the national average.
- These startups are emerging in sectors related to WA's existing industry strengths.
- But WA's reach of startup activity across other sectors is not deep. Beyond the five leading sectors in the state, the relative density of startups across WA quickly drops to only 80% of the national average.
- NSW exhibits more balanced strength across multiple sectors, maintaining robust performance across a wider range of industries.
- In NSW, all but four of the 50 categories presented scores above the national average, demonstrating a far more diversified economic base.
- If WA continues to rely on its traditional strengths without focusing on emerging sectors, it risks lagging behind in industries that can further enhance economic growth, employment and prosperity.
- WA needs to find ways to support startups in new and emerging industries and find ways to support a more diversified and sustainable economy.

Elements of the entrepreneurship ecosystem

- New firms do not emerge in a vacuum.
- Their creation depends heavily on the resources and conditions available to entrepreneurs in specific locations.
- The entrepreneurial ecosystem index looks at ten key elements of the ecosystem: formal institutions, demand, entrepreneurship culture, networks, physical infrastructure, access to finance, leadership, talent, new knowledge, and intermediate services.
- The entrepreneurial ecosystem demonstrates the interdependent relationships between different actors.

Formal Institutions

- Australia's strong institutions and public services should not be taken for granted.
- These need to be protected and maintained, as they set key 'rules of the game' for various agents in the ecosystem.

Entrepreneurship culture, networks and innovation

- Entrepreneurial culture reflects social attitudes towards entrepreneurship.
- Innovation leads to increased revenue, productivity gains and improved customer service.
- Levels of innovation across all businesses is a key indicator of an innovative business community and innovative culture in the region.
- WA had the lowest share of innovation active businesses (41.8%) across the major Australian states.

- Of those innovation active businesses, more businesses across Australia trend towards business processes innovation rather than offering new goods and services.
- In 2022-2023 the information, media and telecommunications industry had the highest share of businesses that recorded being innovation active (62.8%).
- Information, media and telecommunications is closely followed by wholesale trade, manufacturing, the arts and retail trade.
- Networks provide new market entrants with important social capital.
- A tangible measure of the robustness of networks is seen through the collaborative efforts among firms, especially in terms of engaging in innovative projects.
- WA has the third highest share of firms that actively seek out new business partners (18.1%), with only a slight difference compared to other states.
- However, WA also has the lowest share of businesses that have information acquisition capacity, innovation strategies in their business plans, and are the first in their markets to innovate.
- However, WA does have the highest share of businesses that take a proactive approach to market competition.
- A lack of available workers and skills is a key barrier to innovation.
- Most ideas for innovation come from within the company, and from customers and suppliers.

Infrastructure

- In today's digitally driven environment, digital infrastructure is critical. It expands the scope of interactions, networks and markets, allowing connections regardless of geographical distance.
- Digital connectivity for WA is the highest of the five main states, with 88.4% of households reporting access to the internet in 2016-17.
- While overall connectivity rates have improved over time, a digital divide does exist for many, particularly those in remote and regional areas.

Finance

- Funding is a critical component of the startup ecosystem, crucial for both launching new businesses and scaling existing ones.
- In Australia, the venture capital funding sector is notably smaller than the average in the OECD.
- By state, across all business sizes, WA reports the lowest share of businesses reporting lack of access to funds as a barrier to innovation.
- 9.4% of businesses in VIC reported receiving financial assistance from government to support innovative activities.
- WA and QLD reported the lowest share of businesses (7% each) receiving financial assistance from government to support innovative activities.

Talent and Leadership

- Human capital, representing the collective knowledge, experience, and abilities of individuals, plays a pivotal role in driving entrepreneurship and fostering the establishment of new businesses.
- WA has had a relatively low rate of individuals leaving their jobs to launch a new business, sitting at 0.6% of persons in 2024.
- VIC reported the highest share of individuals leaving their jobs to launch a new business in recent years, sitting at 1.4% of persons in 2024 and 2.0% per cent in 2023.
- The share of persons employed as managers is another measure of the skills available to support startups over their life course.
- Some 12.3% of the WA labour force were in a managerial role in 2021, compared to 14.6% in NSW.
- WA also reported the lowest share of businesses using specialist skills to innovate.
- WA is positioned better on engineering skills and legal skills, the former not surprising given the level of engineering expertise related to the resources sector present across the state.
- Key indicators for general human capital include the proportion of the population with tertiary education and the engagement of the working age population in ongoing learning or training initiatives.

- Just 33% of working-age adults in WA hold a bachelor-level-degree or above, compared to 41% in VIC.
- These lower rates of tertiary education align with the relatively large number of businesses reporting that access to skilled workers was a barrier to innovation in WA.
- The Business Innovation and Investment Program (BIIP), aimed at attracting entrepreneurs and business investment, closed permanently to new applications in July 2024. Relative to other states, WA obtained 5.2% of such visa recipients. This compares to WA's share of the national population sitting at 10.9%.
- The generation of new knowledge through private or public sector R&D emerges as a vital driver of entrepreneurship.
- NSW is the largest state in terms of R&D expenditure (\$7.2 billion; \$886 per capita), though VIC (\$847 per capita) and WA (\$807 per capita) are not very far behind on a per capita basis.
- 25% of R&D expenditure by businesses in WA was in the mining industry, sitting at \$565.5 million of the overall \$2.27 billion spent by businesses in 2021-22.
- The primary source of funding for business R&D expenditure is from the researching businesses themselves. Outside of that, the Commonwealth government is the most prolific investor in business R&D, followed by overseas investors and other businesses.

Intermediate Services

- Intermediate services help reduce entry barriers for new ventures and shorten the time it takes to bring innovations to market.
- Until very recently, WA had the lowest share of persons working in knowledge-intensive service industries out of the five mainland states. However, in 2024 this share (35.2%) rose slightly above QLD (34.8%).
- Growing the number of people in knowledge intensive sectors will further support innovation and provide the supports that startups require across WA.
- Outside of private businesses, universities are a critical source of R&D expenditure into new and innovative technologies and processes.
- Total R&D funding in higher education organisations was just under \$14 billion nationally in 2022.
- NSW and VIC are relatively close in the amount of R&D spend by universities, but as a share of GSP, VIC outpaces NSW.
- In dollar terms, WA university R&D expenditure compares favourably to SA and ACT, but in terms of R&D expenditure as a share of GSP, WA is lowest across the states. The sheer scale of WA's GSP relative to the number of universities in the state is a factor at play.

New Knowledge: R&D Investment

- National expenditure on R&D as a share of gross domestic product sits at 1.8% in Australia, while the OECD average is 2.6%.
- This figure is as high as 5.6% in Israel, 3.5% in the USA and 3.1% in Germany.

- By R&D dollars spend, the top five socioeconomic objectives of higher education R&D nationally are health, expanding knowledge, environmental management, manufacturing and law. These five objectives make up over 68% of the total R&D expenditure by higher education institutions.
- WA displays the same top 3 socioeconomic objectives as those reported nationally, but energy and mineral resources are ranked fourth and fifth, respectively.
- This speaks to WA's heavy focus on the resources industry, and comparative advantages in this area. These are critical growth areas for the economy and will become even more important with the opportunities presented through global decarbonisation and the state's capabilities and natural resources that feed into such agendas.
- Patents are seen as an important measure of innovation activity and an outcome of such.
- NSW, with 24,346 patent applications in 2021, is consistently Australia's leading state in terms of annual patent applications, followed by VIC (13,869), QLD (4,293), and WA (2,971). SA (1,912) reported the lowest count of patent applications in 2021.
- Commercialisation is the process of bringing new products and services to market. It involves various activities from production, distribution, marketing, and sales, as well as IP rights and customer supports.
- About 5.7% of innovation active businesses in WA report activity related to the acquisition of patents.
- In terms of innovating businesses, SA enterprises lead in the share of innovation active businesses engaged in market research activities related to commercialisation (35.7%), while reporting the smallest share of marketing skills training activities.
- Contrastingly, businesses in WA hold the lowest proportion of market research activities related to commercialisation but compare well in terms of training.
- Insufficient funding is the most significant barrier for commercialisation of research across all states.
- Businesses in WA identify lack of skills within the business and legal regulations as the other two major challenges to commercialisation.

Quantifying the entrepreneurial ecosystem

- New business creation heavily depends on the resources and conditions available to entrepreneurs in specific locations.
- This study quantifies the national entrepreneurial ecosystem by examining the various interdependent factors that drive and sustain entrepreneurial activity.
- A new national entrepreneurial ecosystem index is generated in this research.

- This report shows that there is a strong, positive, and significant relationship among all ten elements of the ecosystem, confirming that ecosystems are interconnected and operate as a system.
- Improving new knowledge applications, physical infrastructure, and access to finance can significantly contribute to a more robust environment for entrepreneurial activities in Australia.
- The BCEC's estimates of the entrepreneurial ecosystem index are generated at a highly granular level, specifically at the small SA2 area, offering detailed insights into small regions across Australia.
- Greater Perth ranks 5th in the entrepreneurial ecosystem index with Sydney, Melbourne, Brisbane and Adelaide ranked as the top four.
- Greater Perth lags both Greater Sydney and Greater Melbourne across all ecosystem elements.
- Higher entrepreneurial ecosystem index scores are evident in areas close to city centres.
- Inner Perth ranks 3rd nationally across SA4 areas in the entrepreneurial ecosystem index.
- Perth's inner city area surpasses the national average scores of other inner city areas nationally.
- Inner Perth compares well with Sydney and Melbourne in several elements of the ecosystem but lags in new knowledge, talent, and leadership.
- Results emphasise the need to support entrepreneurial growth in regional areas beyond metropolitan hubs.
- At an SA2 level, regions in Melbourne occupy the top three spots in Australia's entrepreneurial ecosystem index.
- Melbourne's central areas outperform Sydney at the SA2 level.
- East Perth (SA2) ranks among the top 20 SA2 areas in Australia.
- Perth's five highest ranked SA2 regions sit within the top 10% of SA2 regions nationally.
- Regional areas in Perth have much weaker startup ecosystems compared to metro areas.

Scenario analysis

- Under a scenario where Perth's entrepreneurial ecosystem index aligned with the national average, an additional 350 startups in WA could be created. This is a 35% increase on the current count of startups in WA.
- These additional startups would result in the direct employment of around 3,500 FTEs, with further spillover jobs also generated across the ecosystem.
- This requires an additional 8,000 individuals to obtain a tertiary qualification, an additional 1,600 individuals with the required leadership qualities to support startups, and a \$440 million increase in R&D expenditure by businesses.

Factors driving startup success

- This report modelled startup success using CrunchBase data with over 2,900 observations of companies that reached an exit stage pooled nationally.
- While there is no universally agreed definition for startup success, the most common and widely adopted measure in the literature is an exit through a successful acquisition and merger or initial public offering (IPO).
- Startups that succeed in obtaining multiple funding rounds have a significantly higher chance of successful acquisition.
- Having previous experience of running a startup increases the chances of successful acquisition by 6ppts.
- Grants also increase the probability of successful acquisition, but to a lesser extent. The results indicated that a \$100,000 increase in grants obtained increases the probability of acquisition by 1.9ppts from 30% to almost 32%.
- Compared to VIC (14.6%) and QLD (7.4%), WA (19.5%) has a larger share of acquired startups that are acquired by WA based companies.
- 80% of startups founded in WA are acquired by companies outside of WA.
- The majority of acquired Australian startups are bought by USA based organisations.
- It is well documented that female founded startups are underrepresented in the startup ecosystem.
- The share of startups acquired by male founded companies (36%) is only slightly higher than that for female founded companies (33%).
- However, for IPO outcome, this share is three times higher for male founded companies (15%) compared to female founded companies (5%).
- A decomposition analysis shows that 55% of the gender gap (10%) in the success rate (via IPO or acquisition versus exit failure) of startups can be explained by startup characteristics.
- The differences in access to grants contribute to 10% of the observed gender disparity in startup success. Put differently, increasing female founders' access to grants to the level of male founders bridges the gender gap by 10%.
- Seed, Series A and Series B funding together account for a further 10% of the gender gap.
- And being successful in obtaining multiple funding rounds has a sizeable effect. Compared to receiving only one funding round, successfully obtaining four or more funding rounds closes the gender gap by 20%.

Recommendations

- Policies focused on fostering leadership, developing talent and skills and providing financial and infrastructural support, particularly in underperforming regions, are essential to strengthen WA's entrepreneurial ecosystem.
- Targeted programs to increase tertiary and vocational education in high growth fields such as technology and business management will help to address talent shortages.
- Additional supports for incubator and accelerator programs are required to develop entrepreneurial skill sets.
- Attracting investment into new industries is critical to ensure that WA catches up with the eastern states and develops a more diversified economy.
- To this end, progress towards building 'Brand WA' as a place to live, work and invest needs to continue.
- Australian public and private R&D spending per capita needs to come into line with OECD averages if the nation is to compete with highly innovative global economies.
- Ongoing certainty around the provision of grants that support the ecosystem and startups is essential towards signalling the importance of, and ongoing commitment to, the diversification agenda.
- These grants need to be at a scale that sufficiently impact the chance of startup success.
- It is essential to continuously monitor elements of the ecosystem over time and to evaluate intervention programs is crucial for identifying emerging trends and tracking the success of the supports provided.

INTRODUCTION

INTRODUCTION

Startups, and the innovation ecosystem in which they operate, are important drivers of employment and economic growth and a key source of new products and services. As well as driving productivity growth, startups create wealth, attract investment and give access to new market opportunities.

The importance of a strong startup ecosystem is well recognised by industry and government, with numerous Western Australian government strategies seeking to develop key elements of the innovation ecosystem.

This Bankwest Curtin Economics Centre report seeks to better understand the environment in which startups operate in Western Australia. This will help to inform policies that support entrepreneurship and startups in the state, and curate an innovation ecosystem within which businesses can thrive.

This report introduces a novel entrepreneurial ecosystem index covering key elements of both the innovation and entrepreneurial ecosystems. The entrepreneurial ecosystem index compares cities and regions across the nation at a small (SA2) geographical area level, with scenarios pointing to how improvements in individual elements of the ecosystem can increase the number of startups present in the WA economy.

Economic modelling looks at the key determinants for startup success such as talent and skills, funding, and government grants. Ways to bridge the gender divide evident amongst startup founders' success rates are also highlighted.

The report provides recommendations that can mitigate fragmentation in the ecosystem and deliver a startup ecosystem in WA that is globally recognised and supports successful startups across the state.

DEFINING STARTUPS AND THE STARTUP ECOSYSTEM

In this report a startup is defined as an innovative and technology-driven company designed to grow fast. It is important to note that not all newly founded companies are considered as startups. A distinctive feature of startup companies is that they have the potential of scalability, the ability to sell their products to a big market. Startups are distinguished by their capacity for innovation, which entails high levels of risk but also the promise of significant returns over time. The revenue trajectory of a successful startup typically exemplifies a 'J curve,' showing initial investment losses followed by a substantial gain in revenue.

While there is no consensus on a single definition of startups, this report broadly follows the definition of startups commonly adopted in the literature and popular data platforms, including Dealroom, Crunchbase and Startup Genome.

In sourcing the data for the analysis of operating startups in the report, a range of filters were applied. Specifically, additional filters are applied to Crunchbase data for the descriptive analysis that utilises information on operating entities founded in the last ten years with primary role as a company. Companies with missing legal names and date of foundation are dropped from the analysis. The modelling of the success factors in the last chapter is based on data on companies that reached exit stage – with status as IPO, acquisition or closed. In this case, operating startups are excluded in the modelling analysis.

Data limitations

It is important to stress that analysis of startup ecosystem data is notoriously difficult. Datasets from different platforms require verification for each individual record. There can be sizeable differences between the records provided by different platforms. Differences in, and changes to definitions of key metrics can vary over time too, pointing to caution in the interpretation of changes.

In this report we use both Dealroom Co (Dealroom) and Crunchbase data. Dealroom data is reported by many state governments with such records receiving an additional level of 'verification' by such authorities. Dealroom data provides additional information for some variables such as the count of employees overtime. For other variables Crunchbase data provides additional insights and is also used for descriptive and modelling purposes. Crunchbase data provides more coverage and granular level of information for categories and subcategories of sectors that is beneficial to mapping the distribution of startups by sector and locations. It is important to acknowledge that both platforms do not constitute an actual census of existing companies due to the nature of the data collection system that is largely based on voluntary data entry by companies and the use of AI.



Startups often aim to introduce something new to the market and show potential for large revenue scalability over a short period of time.



Startups play a crucial role in advanced economies by stimulating progress and prosperity.

WHY DO STARTUPS MATTER?

Startups play a crucial role in advanced economies by stimulating progress and prosperity. They contribute to economic growth and diversification through innovation, increased productivity, job creation, and improve social wellbeing and the liveability of a location.

They are often at the forefront of developing or utilising new innovations and products, and have a capacity to expand, create and open new markets. In doing so, these new businesses are essential to diversification and to maintaining a competitive edge in a globally competitive economy.

Startups help to optimise resources and processes. They are instrumental in boosting productivity, which is critical for the Australian economy at a time when productivity growth has been in decline or stagnant across many sectors for some time. As a case in point, Haltiwanger *et al.* (2016) highlighted that startups in the USA were responsible for more than half of the USA's productivity growth.

Further examination of the literature reveals a link between the age distribution of firms and productivity growth, suggesting that newer firms, assuming they survive, experience a significant increase in productivity, approximately 20 per cent within their first five years (Alon, Berger, Dent, and Pugsley, 2018).

The rise of the knowledge and digital economy has further accentuated the value of entrepreneurial organisations, not just in terms of employment generation and the commercialisation of new inventions but more so in their ability to seize new opportunities, adopt advanced production methods, and redefine market competition (Qin, 2015). The influence of company

creation on enhancing productivity is especially notable in growing industries such as information and communication technologies (OECD, 2001).

Equally, entrepreneurship is pivotal in the innovation process—generating, and applying technological and organisational innovations, which are key to achieving sustainable growth. And this is important at the regional level with the creation of new companies facilitating structural changes, underpinning local economic development and broader economic advancement.

The Western Australian government is aware of the need for diversification, innovation and productivity growth. The *Diversify WA* economic development framework provides a blueprint for the state's diversification agenda.

More recently, the WA government's Innovation Strategy laid out a 10-year plan for the state to reposition itself as a thriving and innovative place to live, work, visit and do business. The strategy speaks to key priority areas of skills and talent, research and technology transfer, access to capital, and innovation precincts and the adaptation of new technology, among others.

While various groups are working towards better understanding elements of the WA innovation and startup ecosystem, there is little cognisance of the economic dimensions for the state. In fact, in September 2024 the Legislative Council of Western Australia's Standing Committee on Public Administration set out a need for a baseline report on the growth, maturity and economic value of the startup and innovation ecosystem in Western Australia (Legislative Council of Western Australia, 2024).

STATE OF PLAY

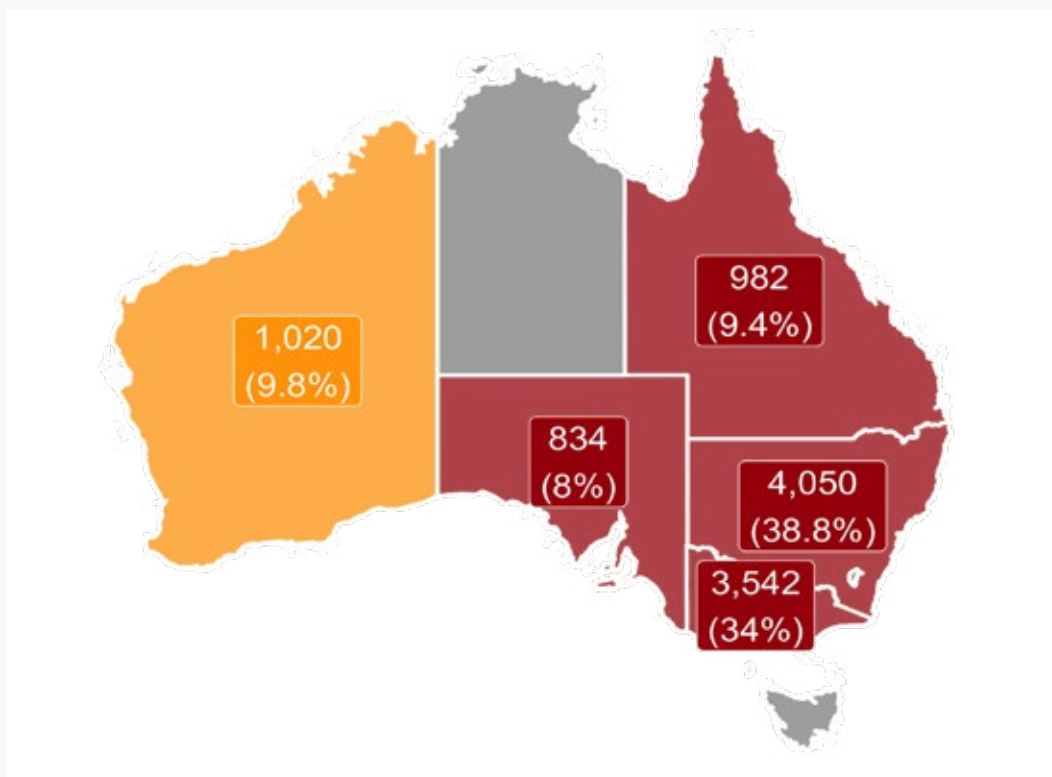
Number of startups

As of September 2024, based on Dealroom data, there are 1,020 startups in WA, accounting for 9.8 per cent of the national count, slightly below the state's share

of the national population (10.9%). This compares to 834 for South Australia, 982 for Queensland, with 3,542 for Victoria. New South Wales reports the largest count of startups at 4,050, almost 39 per cent of the national total.

FIGURE 1

Number and share of startups by state, Australia, 2024



Notes: Includes exits and startups of all age. Tasmania and NT are not reported due to data limitations.

Source: Bankwest Curtin Economics Centre | based on data from the WA State Government Department of JTSI, Investment NSW, LaunchVIC, Advance Queensland, Government of South Australia, all in collaboration with Dealroom.Co.



There are an estimated 1,020 startups in WA, accounting for 9.8% of the national count.



The number of operating startups in WA saw tremendous growth in the years prior to the COVID-19 pandemic.

Figure 2 shows that the number of operating startups in WA saw tremendous growth in the years prior to the COVID-19 pandemic. The pace of new startup entries accelerated from 2010 with a record of 94 new startups established in the state in 2017.

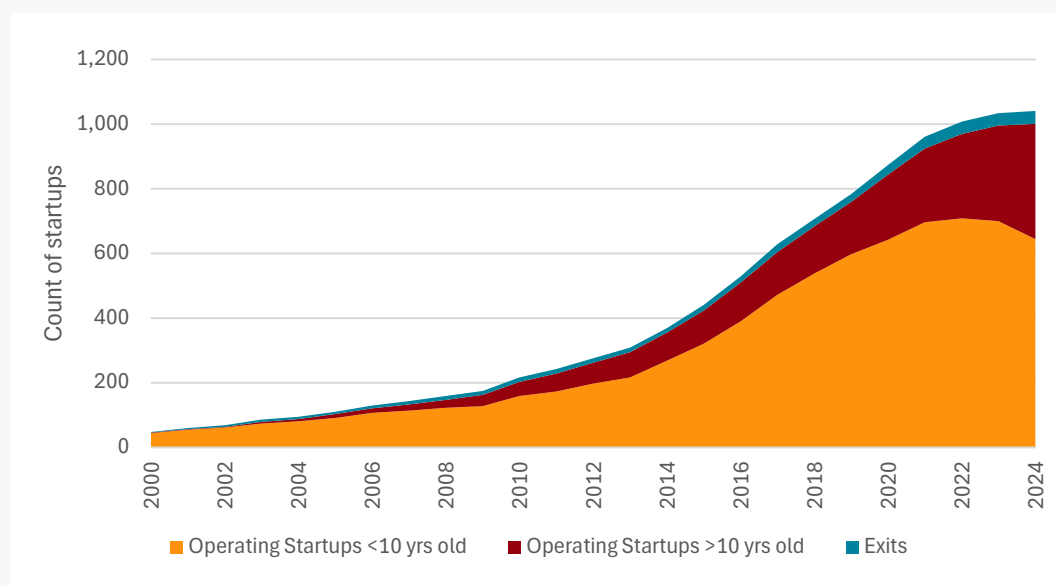
The onset of the COVID-19 pandemic led to recessions observed across many economies globally. Supply chain disruptions and general declines in business and investor

confidence impacted startup creation.

This resulted in a net decline in operating startups – those defined as being established no longer than 10 years ago – in the state, falling from a peak of 708 operating startups in 2022 to 645 operating startups two years later. There is an academic consensus that firms that have existed for longer than 10 years are no longer considered to be startups, having matured into an ordinary business.

FIGURE 2

Count of startups in WA, by operating status, 2000 to 2024



Source: Bankwest Curtin Economics Centre | based on data from the WA State Government Department of JTSI, Investment NSW, LaunchVIC, Advance Queensland, Government of South Australia, all in collaboration with Dealroom.Co.

Startup employment

Given the maturing nature of the startup ecosystem across Australia, the overall number of persons employed by startups remains relatively low but has increased over time.

Roughly 28,000 Australian's worked in startups in 2018, before peaking at 155,000 in 2024. This equates to an increase from 2.4 startup workers to 11.4 startup workers per

1,000 employed persons over the six-year period.

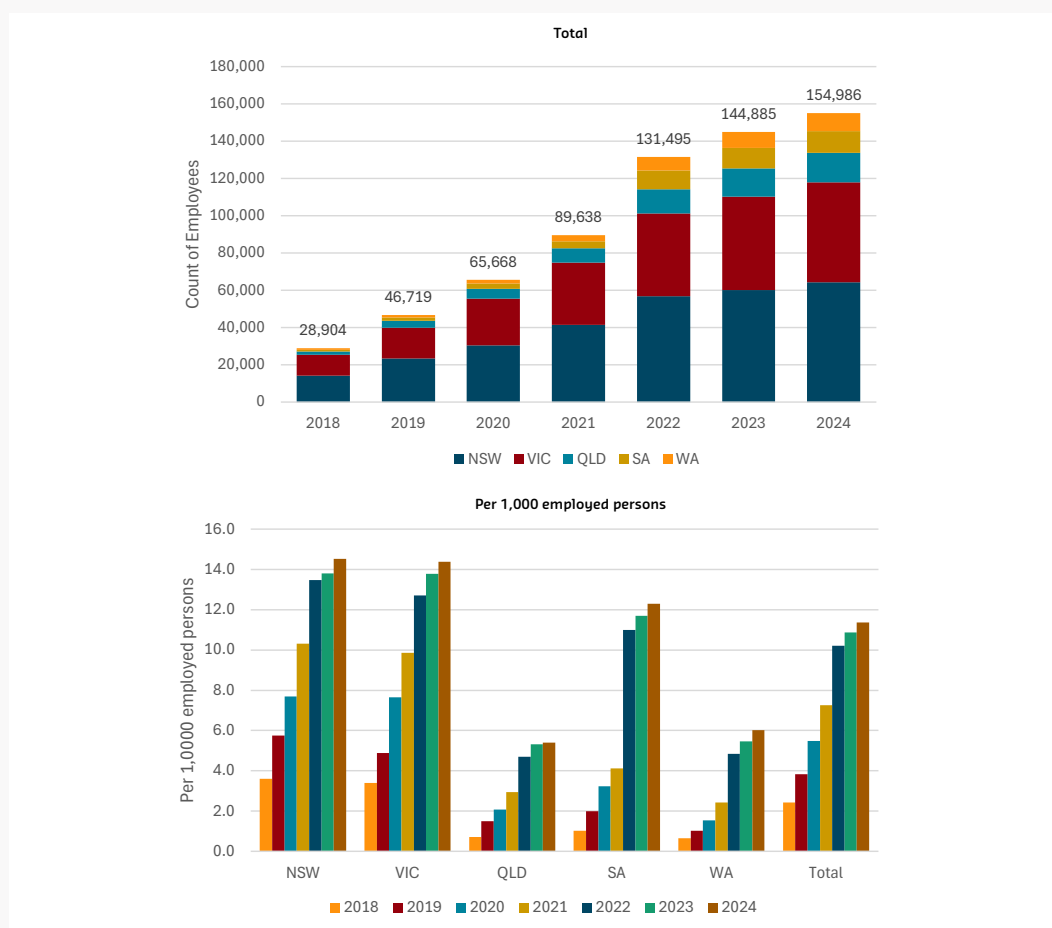
The size of WA's startup labour force is relatively small, reaching a high of roughly 9,652 startup workers as of 2024. Even after taking into consideration WA's smaller working population, there are just 6 startup workers per 1,000 employed persons in WA, compared to 14.5 per 1,000 employed persons in NSW. However, the figure for WA is slightly above that reported by QLD.



Roughly 28,000 Australian's worked in startups in 2018, before peaking at 155,000 in 2024.

FIGURE 3

Number and share of people employed by startups, by state, 2018 to 2024



Source: Bankwest Curtin Economics Centre | based on data from WA State Government Department of JTSI, Investment NSW, LaunchVIC, Advance Queensland, Government of South Australia, all in collaboration with Dealroom.Co, and ABS CAT 6202 Table 12.



The 'VC Winter' relates to a large decline in venture capital funding across the globe.

Funding

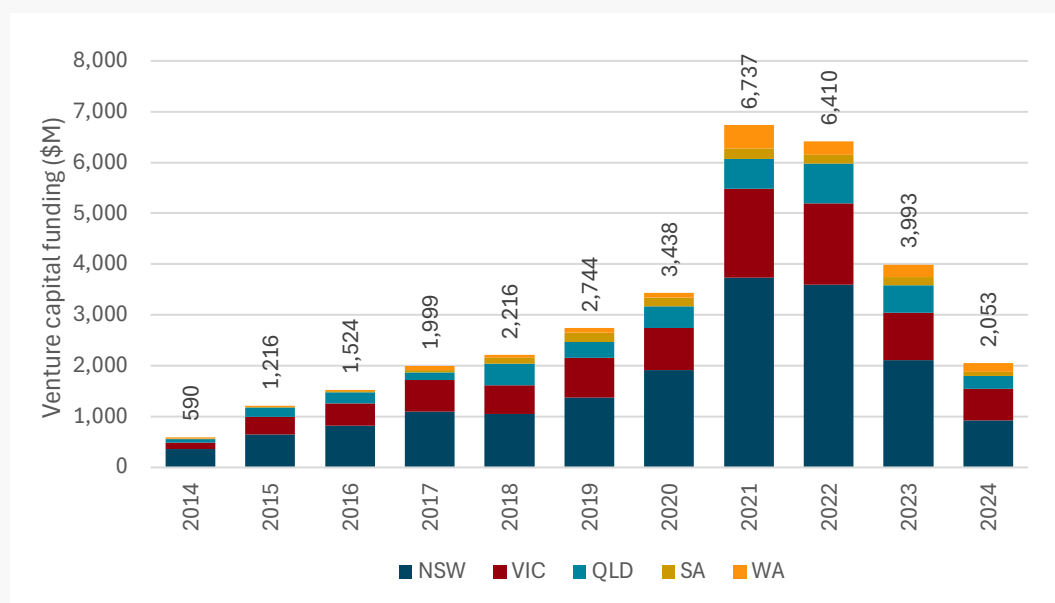
Across Australia, venture capital, grant and Special Purpose Acquisition Company (SPAC) funding targeted at startups trended upwards in the years to 2021, when it reached a peak of \$6.7 billion, before falling to roughly \$2.0 billion in 2024 (Figure 4).

This decline was driven primarily by venture capital funding, which comprised over

90 per cent of startup funding over the years reported in Figure 4. This decline is in line with international data. Due to inflationary pressures, increased interest rates and resulting business uncertainty and slower economic growth, there was low venture capital available globally compared to the heights observed in 2021. This decline is termed the 'VC Winter'.

FIGURE 4

Funding obtained by state, 2014 to 2024



Note: Includes VC, grants and SPAC funding. Excludes Mega and Mega+ funding rounds.

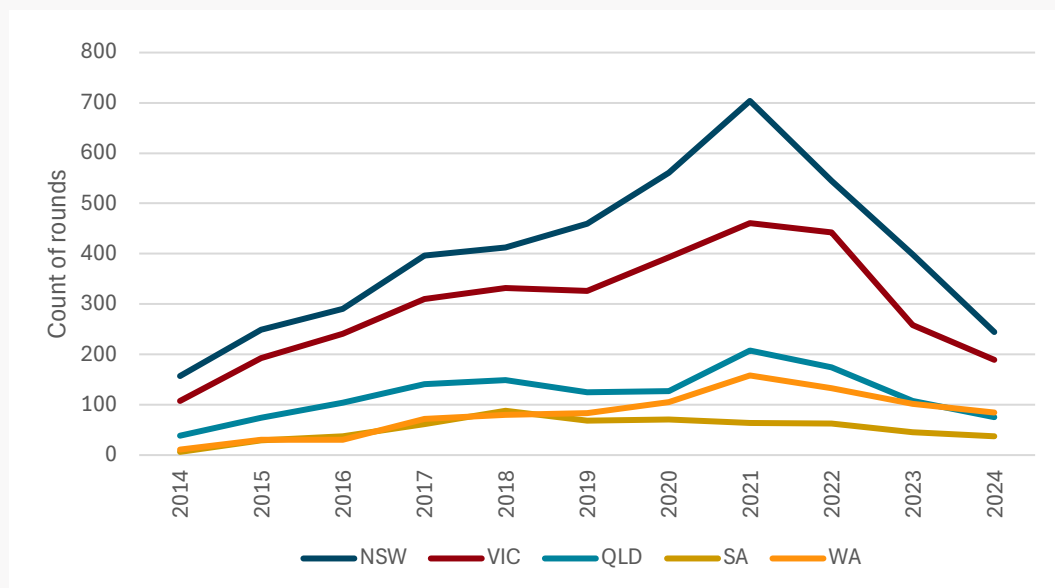
Source: Bankwest Curtin Economics Centre | based on data from the WA State Government Department of JTSI, Investment NSW, LaunchVIC, Advance Queensland, Government of South Australia, all in collaboration with Dealroom.Co.

Whilst WA has had a relatively small share of startup funding over time, even when accounting for a lower amount of funding

rounds in the state in general (as displayed in Figure 5), the state has moved above QLD in recent times.

FIGURE 5

Count of funding rounds by state, 2014 to 2024



Source: Bankwest Curtin Economics Centre | based on data from WA State Government Department of JTSI, Investment NSW, LaunchVIC, Advance Queensland, Government of South Australia, all in collaboration with Dealroom.Co.



In 2024, WA moved above QLD in the count of funding rounds.

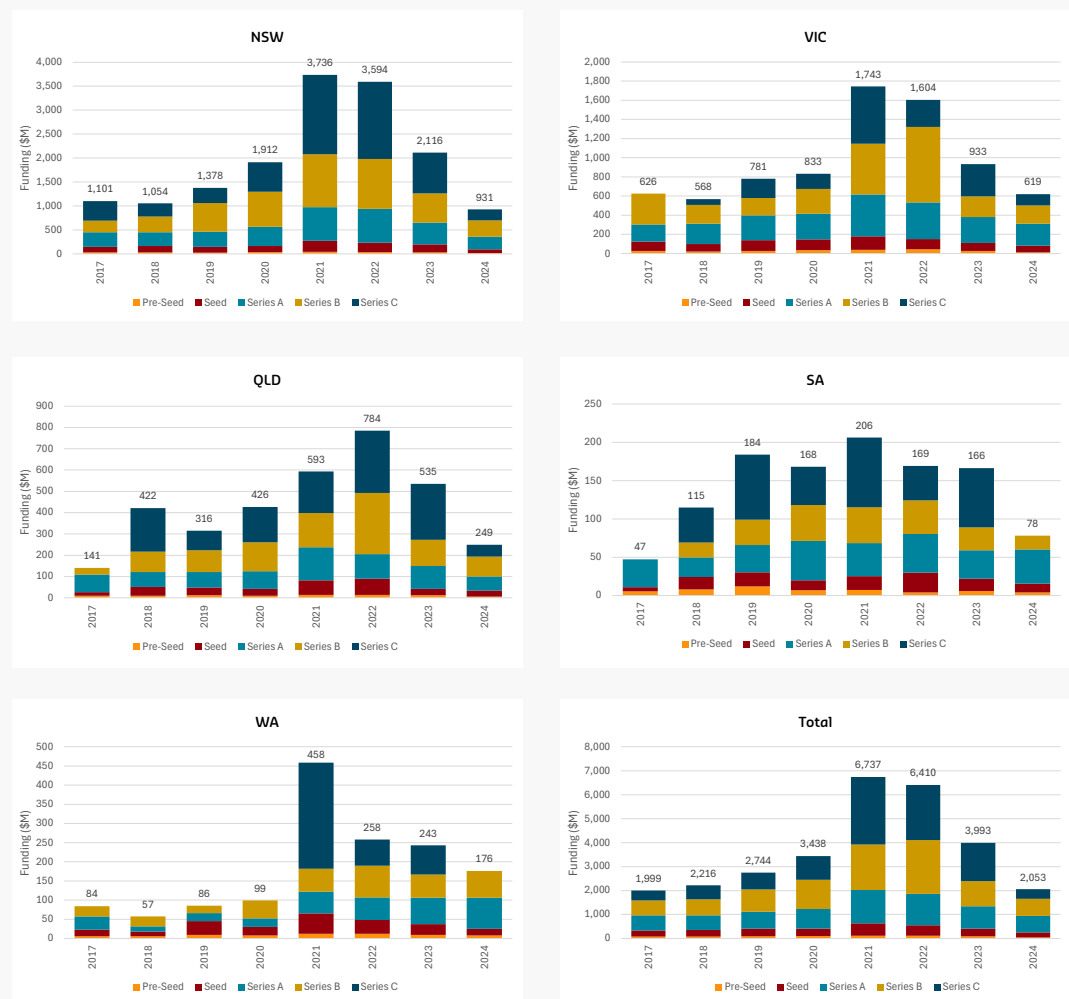
The 'VC Winter' was evident across all the major states as shown in Figure 6. This too shows the breakdown of funding across the stages of the startup cycle from pre-seed (investment in an idea) through to larger Series C funding as the startup business gains success.

Series B funding which takes a business beyond development stage comprises a large

share of investment across the states over time, with Series C funding is also sizeable in share terms over time. The Series C funding is for businesses that are already successful but are looking to develop new products, expand into new markets, or even acquire other companies.

FIGURE 6

Startup funding by state and by funding stage, 2017 to 2024



Notes: Includes VC, grants and SPAC funding. Excludes Mega and Mega+ funding rounds.

Source: Bankwest Curtin Economics Centre | based on data from WA State Government Department of JTSI, Investment NSW, LaunchVIC, Advance Queensland, Government of South Australia, all in collaboration with Dealroom.Co.

WA's overall allocation of funding is relatively varied over time, but in recent years, there has been a high concentration of funding geared towards the energy sector.

While not reported here, WA also received substantial Mega funding rounds in 2024. One such round was run by the EU Innovation Fund that invested roughly \$332 million into clean energy, and another run by the US Department of Energy that invested \$246 million into manganese extraction.

Previous BCEC research (Buckland *et al.*, 2023) showed that WA is well positioned to play a key role in the global decarbonisation agenda. Green shoots are emerging. It is important that WA keeps focus on the economic strengths of the state and looks to support startups in areas related to energy, mining, health and financial and real estate services.



WA is well positioned to play a key role in the global decarbonisation agenda.

FIGURE 7

Funding by industry, WA and Australia, 2017 to 2024



Notes: Includes VC, grants and SPAC funding. Industry funding totals on the Dealroom.Co platform contained double counts, as one startup could belong to multiple industries. Above figures contain reweighted counts by industry to reduce the impact of this. Excludes Mega and Mega+ funding rounds.

Source: Bankwest Curtin Economics Centre | Authors calculations based on data from the WA State Government Department of JTSI in collaboration with Dealroom.Co.



Investment from China to Australia comprised only 2% of overall investment into Australia in 2022-23.

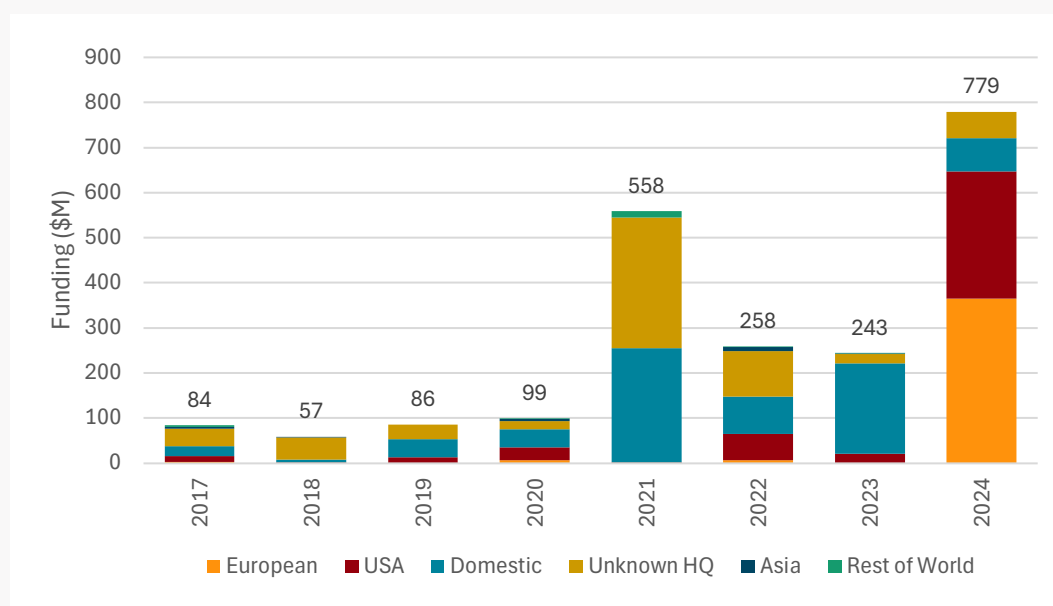
Recently received EU and USA Mega+ funding (included in Figure 8) highlights the importance of sourcing funding not just for startups but for innovation more generally, from large overseas investors.

Despite Australia having a very high level of trade with China (32.4% of exports and 26.3% of imports in 2022-23), investment from China to Australia comprised only 2.0 per cent of overall investment into Australia in 2022-23 (Buckland *et al.*, 2024).

Given the strength of the existing trade relationship between WA and China, there is potential to build this investment partnership particularly in areas that relate to emerging opportunities in energy, rare earths and decarbonisation, with a strong alignment to emerging startups across the state.

FIGURE 8

Geographical source of funding in WA, 2017 to 2024



Note: Includes VC, grants and SPAC funding. Includes Mega and Mega+ funding rounds.

Source: Bankwest Curtin Economics Centre | based on data from the WA State Government Department of JTSI in collaboration with Dealroom.Co.

Diversity

Gender

WA's startup sector is overwhelmingly male dominated. Most startup founders tend to be males, and in turn, most funding goes to startups founded by men.

While Dealroom data does not record the gender for each startup founder, a sample

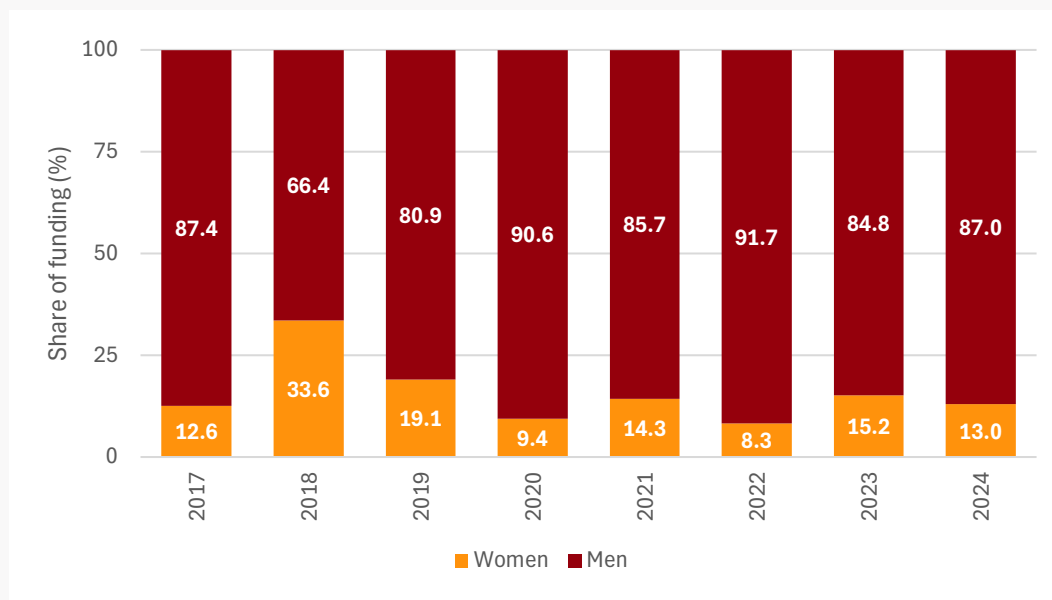
(23%) for which such data is available points to the fact that only 13 per cent of funding was allocated to startups founded by women, with a clear gender imbalance in the startup space both in terms of female entrants and in turn funding allocations. Understanding the gender dimension, and informing ways to close the gap, are returned to later in this report.



WA's startup sector is overwhelmingly male dominated.

FIGURE 9

Share of funding by gender of startup founder, WA, 2017 to 2024



Notes: Based on 231 startups. Not all startups have the founders' gender recorded in this data source. Funding includes VC, grants and SPAC funding.

Source: Bankwest Curtin Economics Centre | based on data from the WA State Government Department of JTSI in collaboration with Dealroom.Co.



The vast majority of WA's startups are founded in Perth.

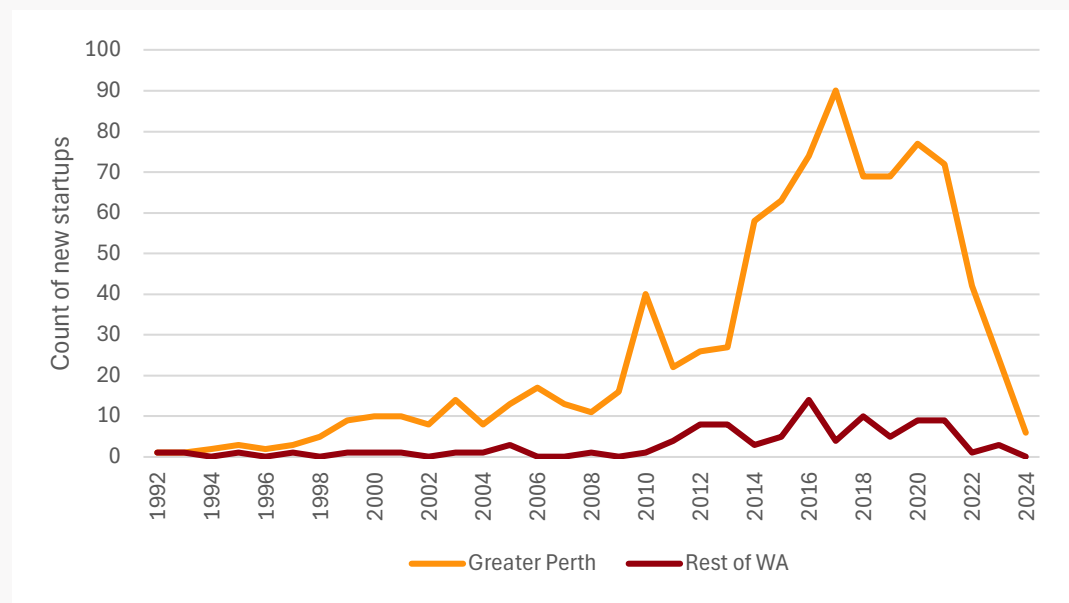
Regions

The vast majority of WA's startups are founded in Perth. This is not surprising with regional areas having deficits in many elements of the ecosystem such as market

size, networks, pool of talent, and access to digital and physical infrastructure relative to the metropolitan areas. Agglomeration effects are critical for startups to emerge and thrive.

FIGURE 10

Count of new startups, Perth and the rest of WA, 1992 to 2024



Source: Bankwest Curtin Economics Centre | based on data from the WA State Government Department of JTSI in collaboration with Dealroom.Co.

DENSITY OF STARTUPS BY SECTOR AND LOCATION

Density of startups by sector

Table 1 presents the density of startups per 100,000 people across key activities or sectors of the economy. A value of 100 denotes equivalence to the national average density. Any score above 100 denotes higher than the national average density with a score below 100 denoting a density below the national average.

The density of startups in WA with primary business activities related to natural resources, energy and manufacturing is high relative to the national average. These startups are emerging in sectors related to WA's existing economic strengths.

TABLE 1

Relative density of startups per 100,000 persons by sector, Australia

	NSW	VIC	QLD	SA	WA	TAS	ACT
Natural Resources	80.9	75.3	117.2	79.3	215.2	56.5	64.0
Energy	94.9	107.8	96.5	88.0	127.9	45.3	75.9
Navigation and Mapping	116.0	97.7	92.9	59.9	126.6	27.7	68.0
Manufacturing	99.5	119.2	96.4	62.4	107.1	59.4	59.7
Science and Engineering	112.3	113.2	85.2	64.8	101.1	22.7	115.8
Sustainability	108.2	115.7	87.7	77.8	89.0	55.5	118.1
Real Estate	112.4	118.0	92.2	59.6	86.4	52.1	48.0
Administrative Services	122.0	118.2	80.0	46.4	83.4	31.0	105.9
Professional Services	122.1	115.7	81.7	56.5	77.0	43.6	111.9
Transportation	105.7	120.9	97.0	72.3	76.8	48.9	70.1
Government and Military	98.2	110.7	100.4	73.2	75.7	51.4	290.6
Agriculture and Farming	115.8	103.3	93.5	74.5	74.3	144.5	88.8
Other	121.5	118.3	77.9	63.3	73.1	42.7	113.6
Events	128.0	121.8	68.7	53.7	72.3	61.5	82.5
Health Care	118.5	116.8	88.7	73.1	69.8	48.0	54.3
Privacy and Security	111.9	121.5	80.1	62.2	69.4	45.1	241.9
Design	119.2	122.3	81.7	66.3	68.1	56.4	66.2
Consumer Electronics	111.7	119.5	96.6	68.5	66.1	11.7	136.0
Data and Analytics	135.6	113.3	69.0	57.5	65.8	30.3	138.1
Hardware	117.3	123.8	87.2	57.6	65.6	30.7	88.0
Education	118.9	115.1	92.5	58.5	65.5	40.7	112.1
Social Impact	110.6	129.0	78.7	63.4	65.2	52.7	165.4
Music and Audio	104.4	152.7	75.7	47.8	64.0	38.6	63.3
Commerce and Shopping	120.1	124.7	84.5	62.8	62.7	46.0	50.4
Biotechnology	108.3	150.5	60.3	74.4	61.1	0.0	180.5
Internet Services	125.6	121.9	80.5	59.2	60.2	38.9	73.0
Information Technology	125.1	121.4	78.1	53.1	59.9	35.1	145.6
Advertising	129.3	114.3	85.1	63.3	59.6	46.4	44.1
Financial Services	139.9	110.4	79.0	49.2	59.3	40.8	49.1
Consumer Goods	119.6	131.9	81.7	54.6	59.0	44.1	39.4
Sales and Marketing	127.8	121.9	80.3	57.9	58.9	38.9	47.8
Food and Beverage	110.1	133.8	77.7	90.7	58.3	85.8	43.9
Community and Lifestyle	129.8	111.4	82.9	66.2	58.1	57.9	88.8
Travel and Tourism	118.5	117.9	92.2	43.0	57.8	69.5	116.4
Software	127.5	122.8	77.8	56.1	56.5	34.0	99.2
Apps	125.9	121.4	80.9	58.9	55.6	46.1	94.3
Messaging and Telecommunications	125.5	123.5	87.3	50.5	55.2	16.3	40.1
Sports	117.8	121.6	89.3	67.8	55.1	53.7	86.3
Media and Entertainment	130.2	123.6	72.4	56.1	54.2	49.5	96.4
Video	138.7	118.8	73.8	51.7	54.0	34.8	42.7
Content and Publishing	137.6	123.6	67.1	51.6	51.8	40.7	75.0
Mobile	121.7	130.8	80.6	59.4	51.7	36.0	73.7
Platforms	103.1	151.0	80.0	91.3	48.9	24.6	30.2
Clothing and Apparel	129.5	120.5	86.4	55.2	46.4	48.0	42.1
Lending and Investments	155.0	107.5	70.8	49.5	45.0	35.5	16.4
Gaming	105.4	137.9	85.3	60.5	44.9	15.0	240.3
Payments	137.2	120.0	76.6	59.7	43.4	0.0	92.8
Blockchain and Cryptocurrency	135.0	111.8	91.8	55.6	38.1	12.0	117.7
Artificial Intelligence (AI)	148.6	113.0	65.4	62.4	36.5	18.3	142.6

Note: A value of 100 equates to the Australian national average density of startups per 100,000 of the population. Sorted based on WA ranking.

Source: Bankwest Curtin Economics Centre | Authors' calculations from Crunchbase and ABS population data.



The density of startups in WA with primary business activities related to natural resources, energy and manufacturing is high relative to the national average.



If WA continues to rely on its traditional strengths, it risks falling further behind in industries that can further enhance economic growth, employment and prosperity.

But WA's reach of startup activity across other sectors is not deep. Beyond the five leading sectors for the state, the relative density of sectors across WA quickly drops to only 80 per cent of the national average.

NSW exhibits more balanced strength across multiple sectors, maintaining robust performance across a wider range of industries. In NSW, all but four of the 50 categories presented score above the national average, demonstrating a far more diversified economic base (Figure 11).

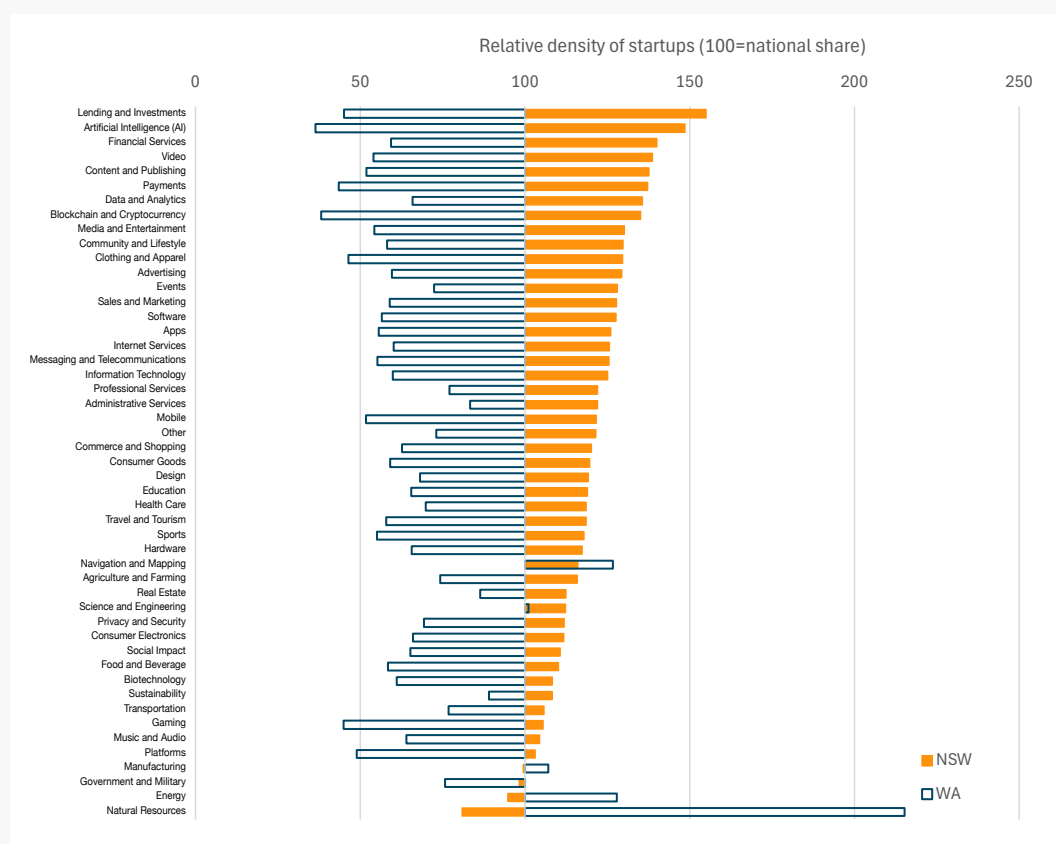
NSW has tapped into new growth industries, with startup activities linked to high-tech

fields such as artificial intelligence (AI), automation, and robotics. In contrast, WA is underrepresented in these fields, missing out on substantial growth opportunities, and in the development of sectors critical for diversification.

If WA continues to rely on its traditional strengths without also focusing on emerging sectors, it risks falling further behind in industries that can further enhance economic growth, employment and prosperity. WA needs to find ways to support startups in new and emerging industries and explore ways to support a more diversified and sustainable economy.

FIGURE 11

Relative density of startups per 100,000 persons by sector/activity, NSW and WA



Notes: A value of 100 equates to the Australian national average density of startups per 100,000 of the population. Sorted based on NSW ranking.

Source: Bankwest Curtin Economics Centre | Authors' calculations from Crunchbase and ABS population data.

Like NSW, Victoria presents balanced strength across multiple sectors (Figure 12). Victoria's startup density is highest in areas such as biotechnology, gaming, and music. The gap in WA's startup density in these industries is again clearly evident.

ACT shows a strong startup presence in sectors like government, AI, data analytics, and biotechnology (refer to appendix Figure 56). However, ACT and WA appear to perform similarly in startup concentration within consumer focused sectors.

QLD shares a similar startup profile with WA, particularly with strong activity in

the natural resources sector (refer to appendix Figure 57). However, QLD's startup landscape is also more diversified than that of WA, with significant startup concentration across a broader range of industries.

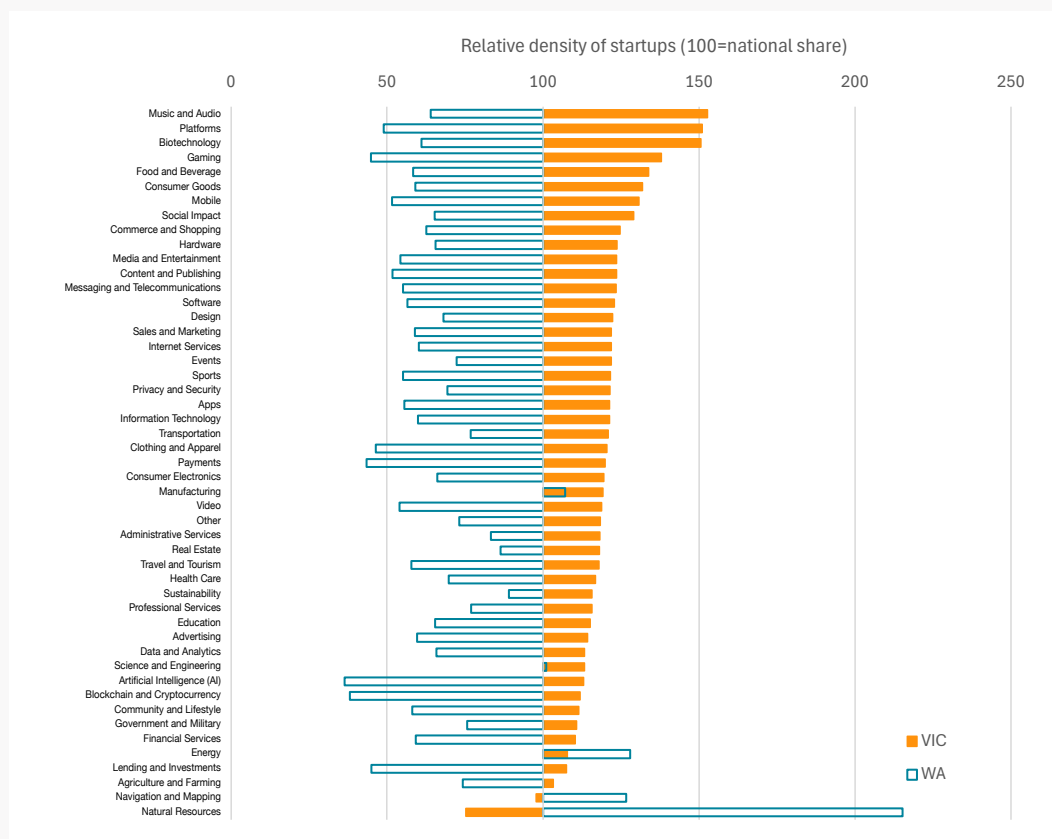
Overall, these trends indicate that WA's startup landscape could benefit from broader industry diversification, particularly to mitigate the risk of over-dependence on specific sectors, a condition sometimes referred to as 'Dutch Disease', where resource focused economies lag in other industries.



WA's startup landscape could benefit from broader industry diversification.

FIGURE 12

Relative density of startups per 100,000 persons by sector/activity, VIC and WA



Notes: A value of 100 equates to the Australian national average density of startups per 100,000 of the population. Sorted based on VIC ranking.

Source: Bankwest Curtin Economics Centre | Authors' calculations from Crunchbase and ABS population data.

Density of startups by regional distribution, Perth

Figure 13, Figure 14 and Figure 15 illustrate the geographical distribution of startups in Perth across key sector groupings. These have been categorised into somewhat related themes, and separated to emphasise the location of such sectors across the greater Perth region.

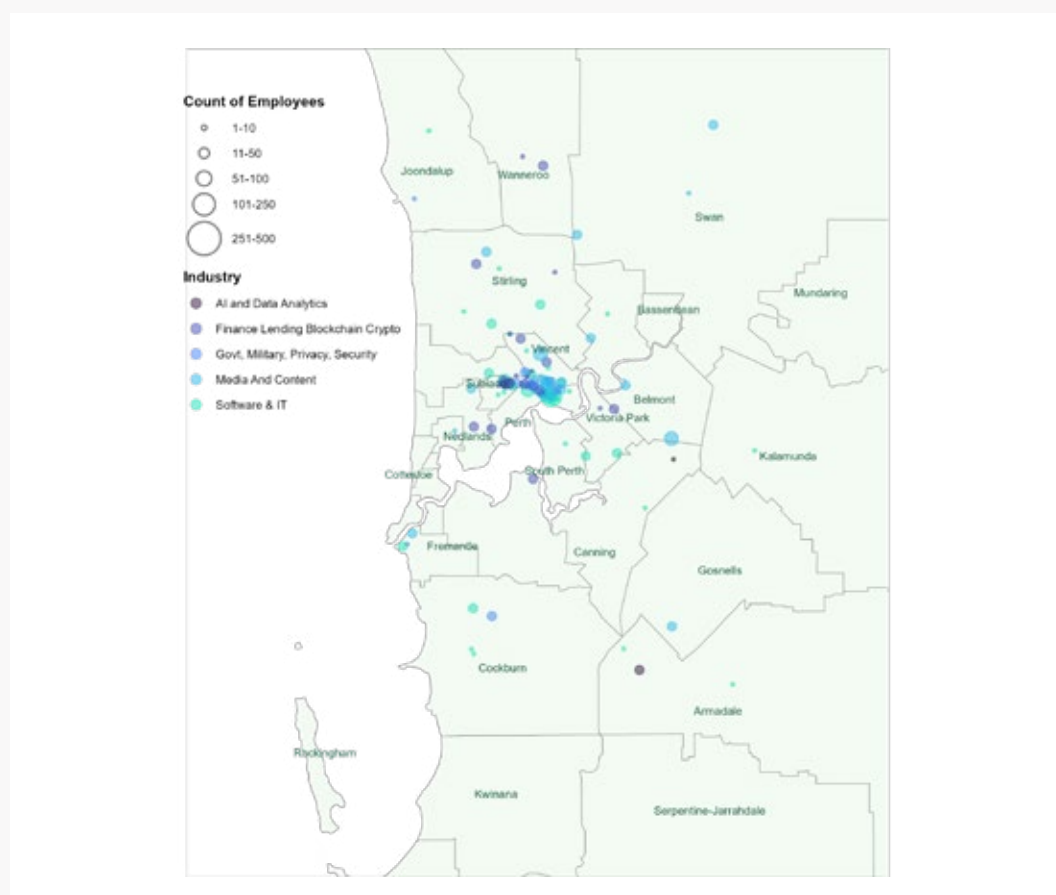
Figure 13 plots startups with primary activities related to government, military, privacy and security, media and content, AI and data analytics as well as finance and software.

The map displays a concentration of startups relating to software, media and government within Perth's inner city and nearby suburbs, including the City of Subiaco and City of Vincent. Startups in finance are also evident in Nedlands and further north in Wanneroo, as well as South Perth.

Additional clusters of startups are found in Fremantle, Victoria Park, and Stirling, indicating a central hub of startup activity in both core and surrounding areas for these sectors.

FIGURE 13

Location of startups in WA related to government, AI and data analytics, finance, media and content and software and IT



Source: Bankwest Curtin Economics Centre | Authors' calculations from Crunchbase and ABS population data.

When focusing on startups in manufacturing, natural resources, energy, and professional and scientific services, a similar pattern emerges, with a high number of startups situated in Perth's inner city, Subiaco and City of Vincent (Figure 14).

However, this map also shows clustering in centres beyond the central business district (CBD) and neighbouring local government areas (LGA).

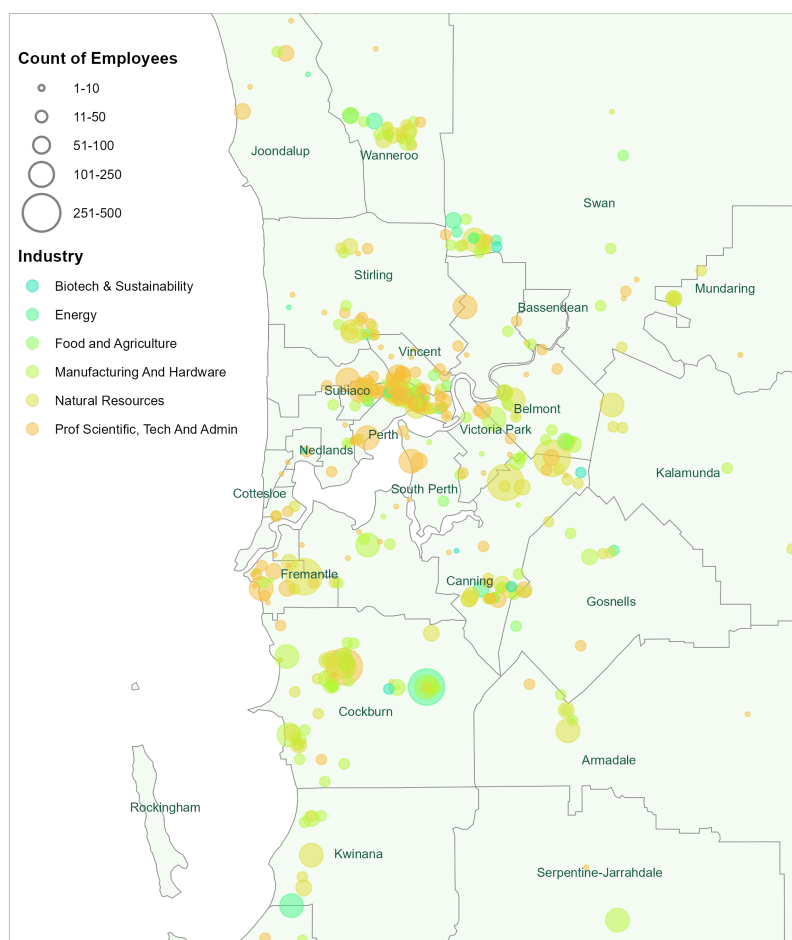
For example, the City of Wanneroo to the north, Cockburn and Kwinana to the south, as well as Canning, Victoria Park and Fremantle display notable startup clusters. These strengths relate particularly to the professional, scientific and administrative sector as well as natural resources and manufacturing. But there are also pockets related to energy and biotechnology.



There are a high number of startups situated in Perth's inner city, Subiaco and City of Vincent.

FIGURE 14

Location of startups in WA related to manufacturing, resources, energy and professional and scientific services



Source: Bankwest Curtin Economics Centre | Authors' calculations from Crunchbase and ABS population data.



Perth's CBD remains the primary hub for innovation and startup activity.

But surrounding suburbs display the ability to support startups and become significant secondary nodes.

The Perth city density pattern is also observed among startups in the consumption services sector, which includes education, health and medical services, travel and sports and social impact and lifestyle related startup activity (Figure 15).

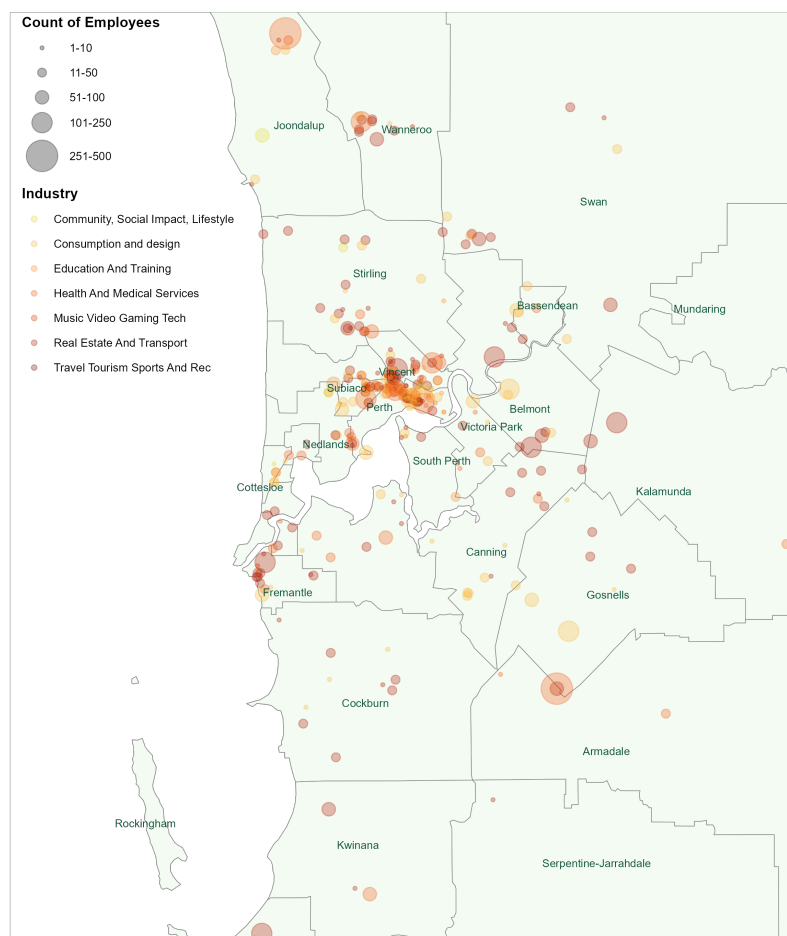
However, these activities are also present in suburban LGAs with clusters in Wanneroo again evident, as well as Nedlands, Victoria Park and Belmont and Fremantle. Scatterings to the south and west are also evident.

These findings suggest that while Perth's CBD remains the primary hub for innovation and startup activity, surrounding suburbs display the ability to support startups and become significant secondary nodes, reflecting an expanding ecosystem that can support local businesses and local jobs.

But startups do not emerge in a vacuum. This report now turns to understanding elements of WA's entrepreneurial ecosystem and how elements of the ecosystem compare to jurisdictions across the nation.

FIGURE 15

Location of startups in WA related to consumption services



Source: Bankwest Curtin Economics Centre | Authors' calculations from Crunchbase and ABS population data.



ELEMENTS OF THE ENTREPRENEURIAL ECOSYSTEM



The entrepreneurial ecosystem demonstrates the interdependent relationships between different actors.

ENTREPRENEURIAL ECOSYSTEM AND ORGANISING FRAMEWORK

The entrepreneurial ecosystem is a dynamic and self-organising network comprised of varied entities. These entities collectively facilitate the birth, development, and eventual exit of entrepreneurial ventures (Roundy *et al.*, 2018; Stam and Van de Ven, 2019).

The concept of an ecosystem, borrowed from ecological and biological sciences, explains the involved interactions between organisms and their environments. Similarly, in an entrepreneurial ecosystem, the focus is on the interdependent relationships between different actors, such as investors, government entities, support organisations,

and entrepreneurs themselves, and how these interactions nurture or hinder the growth of startups.

Understanding the complexity and health of the elements of the ecosystem goes a long way towards explaining the quality and innovation level of startups, providing insights into their potential for success and expansion in what is a globally competitive landscape.

Key indicators relating to the elements and of the ecosystem are displayed in Table 2 below and will be discussed in the sections that follow.

TABLE 2
Elements of the entrepreneurial ecosystem



Source: Bankwest Curtin Economics Centre | Adapted from Leendertse, Schrijvers and Stam (2022).

FORMAL INSTITUTIONS

Australia has a strong international reputation as a secure place to invest and do business. IMD (2024) ranked Australia's competitiveness as 13th out of 67 nations. Key metrics leading to this outcome relate to the stability of the economy, transparent legal and regulatory frameworks that support investment, and good infrastructure. Other factors include business efficiency, government efficiency and a skilled workforce.

Australia's strong institutions and public services should not be taken for granted.



Australia's strong institutions and public services should not be taken for granted.



Entrepreneurial culture reflects social attitudes towards entrepreneurship.

ENTREPRENEURIAL CULTURE, NETWORKS AND INNOVATION

The cultural framework within which startups operate plays a pivotal role in shaping entrepreneurial activities. This framework, regarded as an informal institution, significantly impacts the value placed on entrepreneurship and the extent to which it is encouraged within a society. An entrepreneurial culture reflects social attitudes towards entrepreneurship, influencing both the aspirations of prospective entrepreneurs and the likelihood of individuals embarking on entrepreneurial ventures (GEM, 2023).

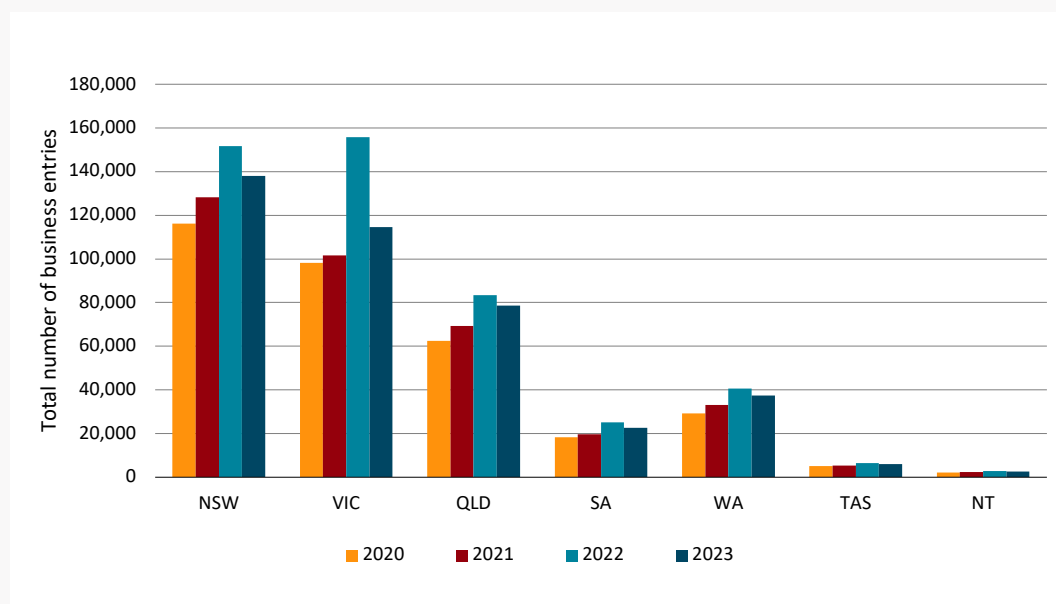
In environments where there is a high level of trust and support for innovation, entrepreneurs are more likely to succeed and contribute to the overall economic development.

Businesses entries

An indirect measure of entrepreneurial culture is the prevalence of new business entries. Overall business growth has been steady across Australia in recent years, although a slight drop was evident in 2023 (Figure 16). The 'VC winter' is likely to have had some impact, but general economic uncertainty, higher cost of borrowing through increased interest rates, and tight labour markets would have impacted this too. However, the overall trend remains upward and with inflation coming down and labour markets remaining strong, this trend is likely to continue for 2024 and beyond.

FIGURE 16

Total number of business entries by state, 2020 to 2023



Source: Bankwest Curtin Economics Centre | ABS Counts of Australian Businesses.

Innovation active businesses

Levels of innovation across all businesses is a key indicator of an innovative business community and innovative culture in the region.

The information, media and telecommunications industry had the highest share of businesses that recorded being innovation active (62.8%) when surveyed in 2022-23 (Figure 17). This is likely due to the high focus on information technology focused research and development in this industry sector, with many companies trying to compete in terms of new and innovative offerings to customers.

Information, media and telecommunications is closely followed by wholesale trade, manufacturing, the arts and retail trade.

Meanwhile, the agriculture, forestry, and fishing industry had the lowest share of businesses that claimed to be innovation active in 2022-23 (33.6%), closely followed by the construction and transport sectors.

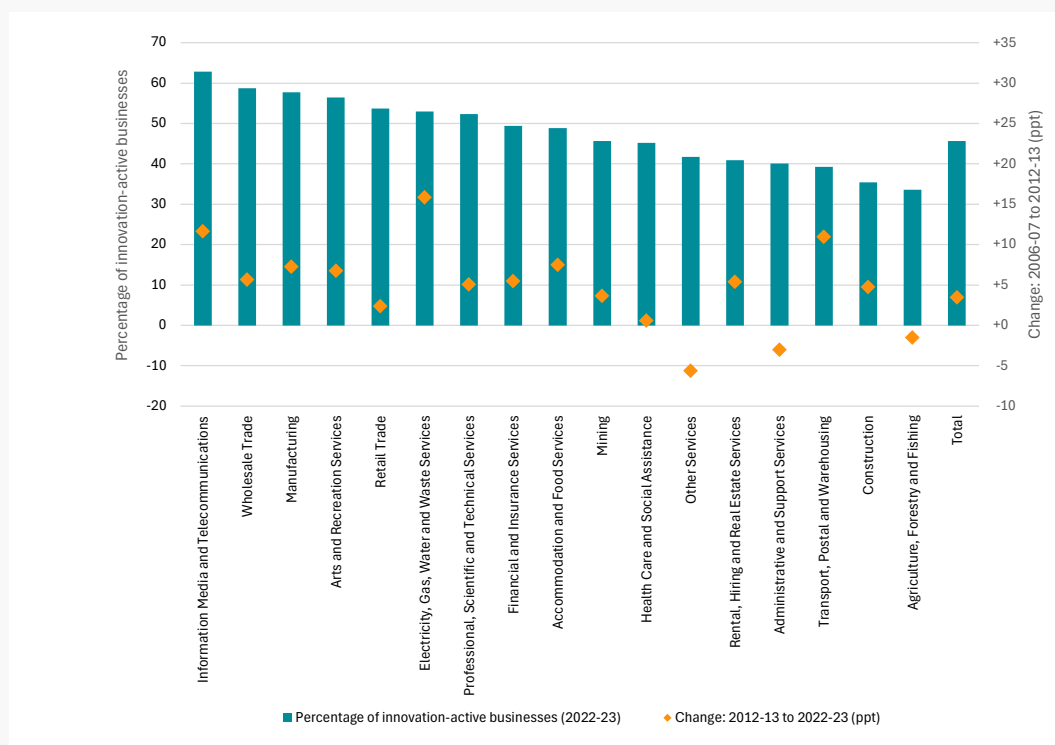
Interestingly, the electricity, gas, water, and waste services industry saw the highest percentage point growth in the share of businesses that reported being innovation active over the ten years between 2012-13 and 2022-23 (+15.9ppt), likely driven by growing demand for renewable energy sources.



The information, media and telecommunications industry had the highest share of businesses across Australia that recorded being innovation active in 2022-23.

FIGURE 17

Share of innovation active businesses in Australia, 2022-23 and change on 2012-13



Notes: Figures denote the proportion of businesses in each industry sector that report any innovative activity. Changes are expressed as percentage point differences between 2012-13 and 2022-23 for all industry sectors.

Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Innovation in Australian Business, 2022-23.



WA had the lowest share of innovation active businesses (41.8%) across the major Australian states.

By state, WA had the lowest share of innovation active businesses (41.8%) followed by SA (44.7%), with QLD (47.3%) coming out on top (Figure 18).

Australian businesses regarded as innovation active leaned more towards business processes innovation rather than offering new goods and services.

QLD had the highest share of businesses reporting business process (34.9%), whilst NSW and QLD were tied in terms of businesses with innovative goods and services (22.8%).

WA had the lowest overall share of innovative businesses across the two categories, with only 27.1 per cent of businesses engaging

in business innovation and 17.4 per cent offering innovative goods and services to customers.

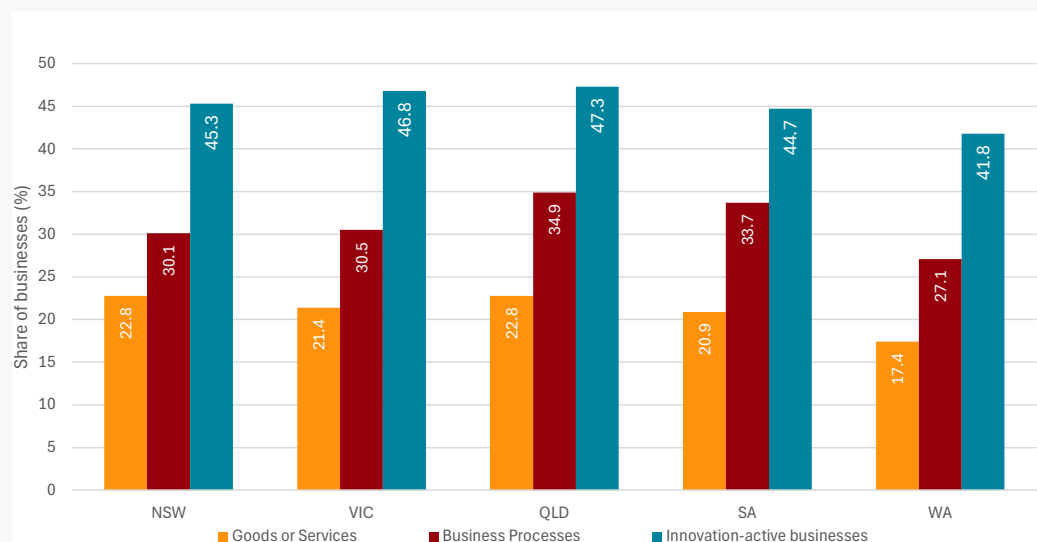
Australian businesses are primarily adopters, adapters, and incremental improvers. This, in and of itself, is not a bad thing.

But it does imply that a highly skilled workforce is needed to learn and take on new innovative practices and processes to ensure that Australian businesses remain efficient, innovative, and globally competitive.

And key Australian industries need to continue to strive for new points of difference, particularly as they relate to emerging opportunities in a decarbonisation world with a global green agenda.

FIGURE 18

Businesses that introduced any new or significantly improved goods or services and share of innovation active businesses by state, 2022-23



Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Innovation in Australian Business, 2022-23.

The strength of connections within networks plays a pivotal role in an innovative society by facilitating the flow of information, labour, and knowledge among firms. Networks help new market entrants accumulate social capital. This accumulation is crucial as it empowers firms to share various resources, information, and knowledge essential for their growth and establishment in the market.

A tangible measure of the robustness of these networks is seen through the collaborative efforts among firms, especially in terms of engaging in innovative projects.

Across all businesses, WA is the state with the highest share of businesses (33.5%) that took a proactive approach to market competition and ranks first for engaging in high risk/reward projects.

WA has the third highest share of firms that actively sought out new business partners (18.1%).

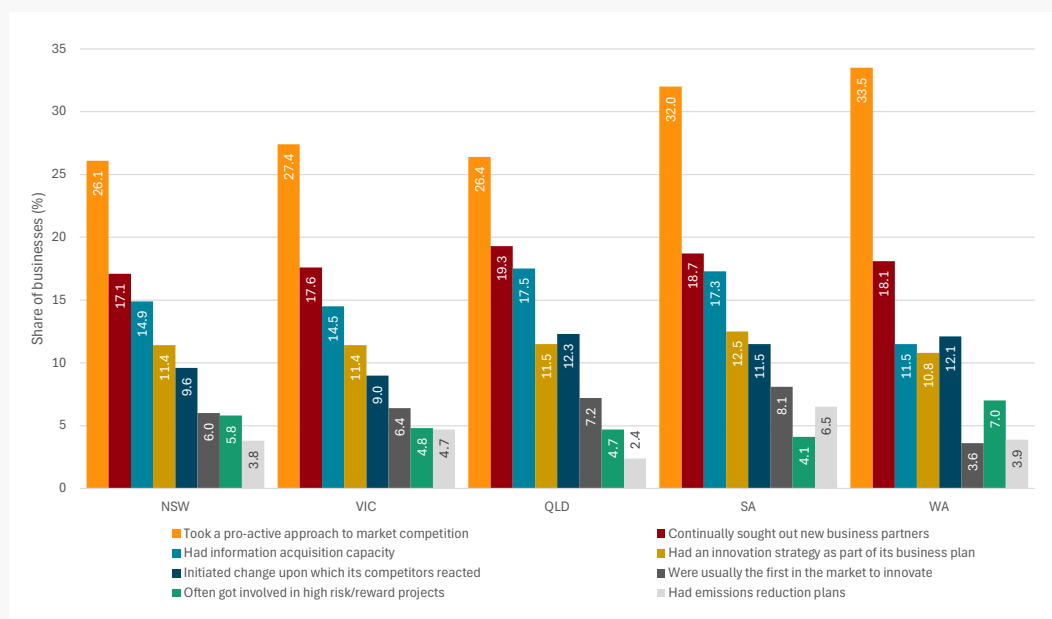
However, WA also had the lowest share of businesses that had information acquisition capacity and innovation strategies in their business plans and were the first in their markets to innovate.



Networks help new market entrants accumulate social capital.

FIGURE 19

Share of all businesses by entrepreneurial orientation, by state, 2022-23



Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Innovation in Australian Business, 2022-23.



Innovation leads to increased revenue, productivity gains and improved customer service.

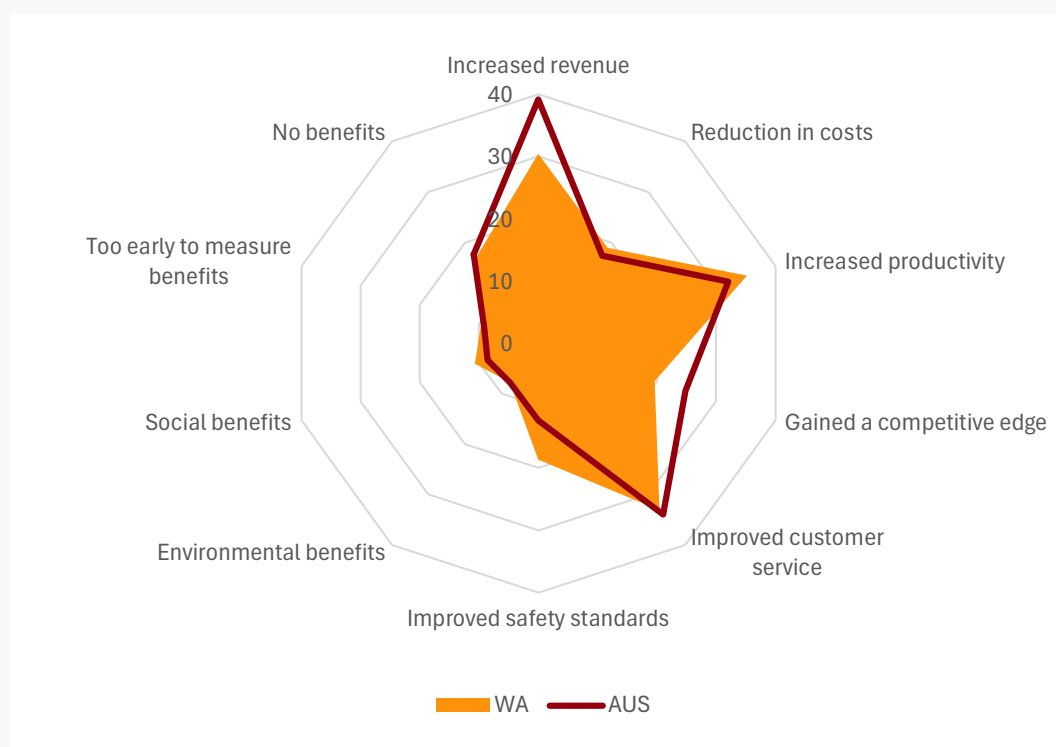
Benefits and barriers to innovation

Businesses engaging in innovation reported several benefits to such. The benefits reported by WA businesses align for the most part with those reported at the national level (Figure 20), such as reduction in costs, and improved customer services.

However, a higher share of businesses in WA reported productivity boosts from innovating, improved safety standards, and social and environmental benefits compared to the national average. And a lower share of WA businesses reported benefits relating to gaining a competitive edge, and increased revenue.

FIGURE 20

Benefits of introduced innovation, Australia and WA, 2022-23



Note: Share of respondents that reported innovation activity.

Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Innovation in Australian Business, 2022-23.

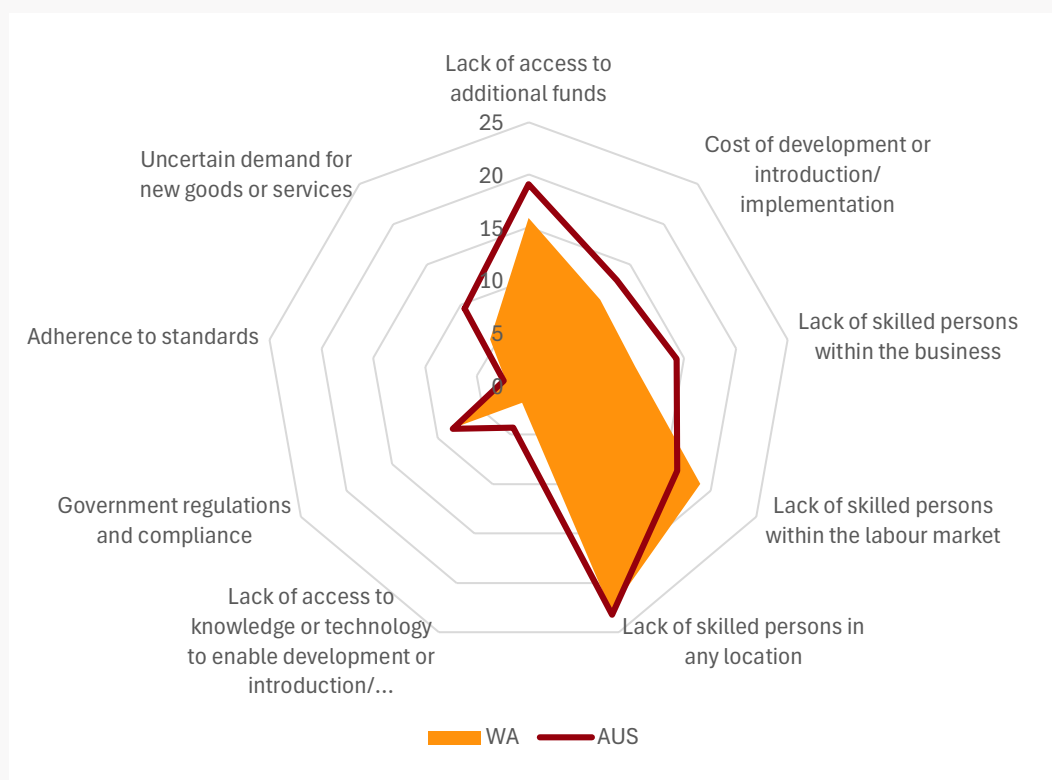
As for the share of innovation active businesses reporting barriers to innovation, key barriers relate to the access of labour and skills and access to funds, followed by adherence to standards.

Across most of the barriers to innovation reported in Figure 21, a lower share of innovation active businesses in WA in 2022-23 reported these factors as barriers relative to the Australian average.

The share of WA businesses reporting government regulations and compliance as a barrier to innovation was on a par with the national average. But having access to skilled persons within the labour market was seen as a greater barrier for businesses in WA compared to the national average.

FIGURE 21

Barriers to innovation, by employment size, Australia and WA, 2022-23



Note: Share of respondents that reported innovation activity.

Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Innovation in Australian Business, 2022-23.



Most ideas for innovation come from within the company, as well as from customers and from suppliers.

Source of ideas

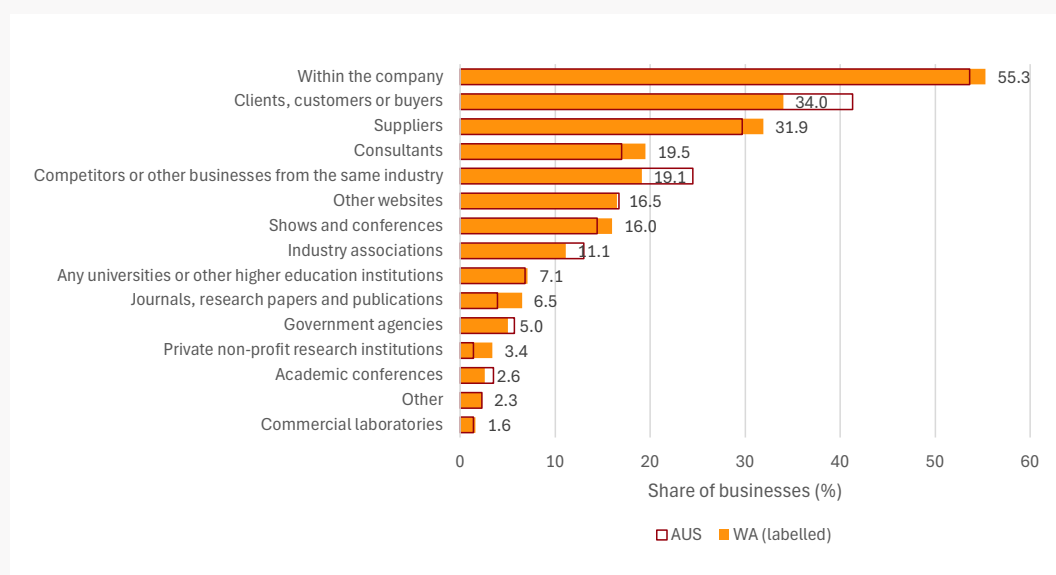
There are many different sources of inspiration that firms can look to for ideas on new ways to innovate. The most reported source of ideas, both in WA and nationally, was from within the company itself (55.3% of WA businesses), followed by customers and suppliers.

The least common source of ideas both nationally and in WA was commercial laboratories (just 1.6% of respondents from WA).

For some businesses, universities, government agencies and industry associations play a pivotal role as a source of ideas.

FIGURE 22

Sources of ideas or information for innovation, AUS and WA, share of businesses, 2022-23



Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Innovation in Australian Business, 2022-23.

INFRASTRUCTURE

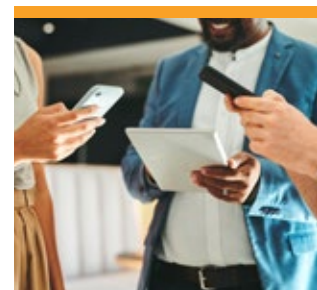
The foundation of physical infrastructure plays a critical role in facilitating economic exchanges and is, therefore, vital for fostering entrepreneurship (Audretsch *et al.*, 2015).

WA's Transperth rail network connects Perth city to the outer suburbs, going as far south as Mandurah and north to Yanchep. Factors such as the COVID-19 pandemic have put significant delays on plans to expand and overhaul the rail network, with renovations to the Armadale line still underway. The state also has a functional cargo-rail system in place, which is primarily used to haul agricultural and resource products from regional areas to ports for exporting and distribution. This important infrastructure can support new and emerging markets and product and service delivery. However, as will be pointed out later in this report, more can be done to ensure WA's infrastructure is comparable to eastern states to strengthen the innovation ecosystem.

In today's digitally driven environment, the importance of digital infrastructure is also critical. It expands the scope of interactions, networks and markets, allowing connections regardless of geographical distance.

Digital connectivity for WA is the highest of the five main states, with 88.4 per cent of households reporting access to the internet in 2016-17. This compares to 85.2 per cent for NSW, 86.8 per cent for VIC, 86.3 per cent for QLD and 82.5 per cent for SA.

While overall connectivity rates have improved over time, a digital divide does exist for many, particularly those in remote and regional areas (Bond-Smith *et al.*, 2019). This critical issue needs to be addressed to ensure that regional communities can fully engage in the digital economy and seize the opportunities presented.

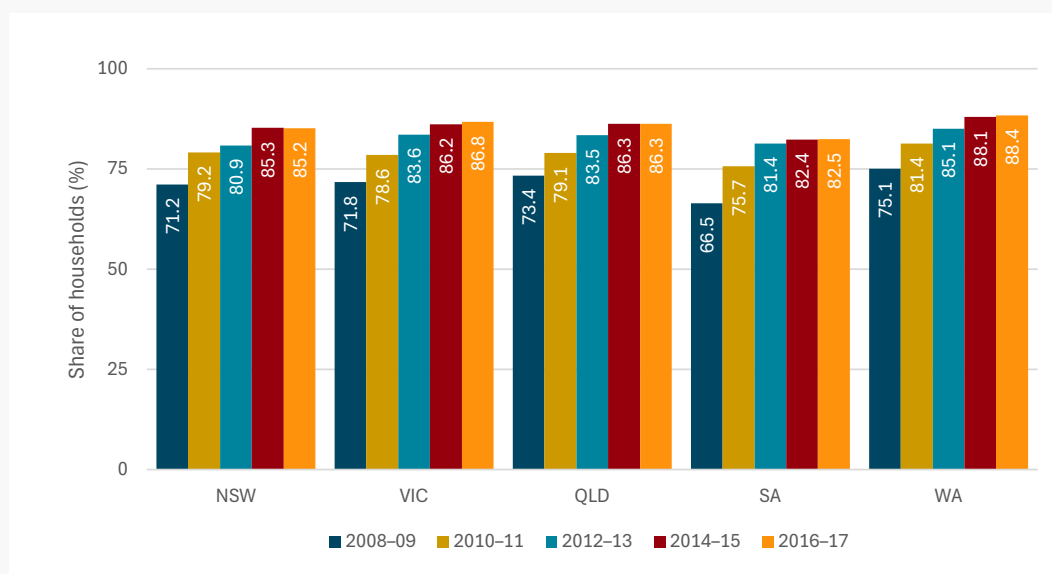


Digital infrastructure expands the scope of interactions, networks and markets.

A digital divide does exist for many, particularly those in remote and regional areas.

FIGURE 23

Share of households with internet access, 2008-09 to 2016-17



Notes: The ABS discontinued collection of this data, with 2016-17 the most recent available.

Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Household Use of Information Technology, Australia, 2016-17.



By state, WA had the lowest share of businesses reporting a lack of access to funds as a barrier to innovation.

FINANCE

Funding is a critical component of the startup ecosystem, crucial for both launching new businesses and scaling existing ones. In Australia, the venture capital funding sector is notably smaller than the average in the Organization for Economic Cooperation and Development (OECD).

Venture capital funding plays a vital role not just in providing financial resources and expertise to startups, but also in facilitating the spread of knowledge and innovation. The importance of venture capital funding is underscored by the fact that major corporations like Apple, Alphabet (Google), and Microsoft were principally funded by venture capital funding in their early stages.

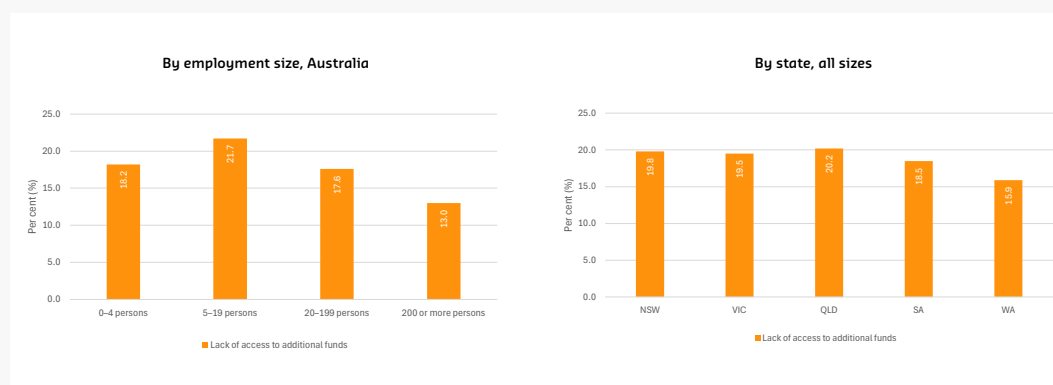
Venture capital funding obtained by startups in WA was discussed earlier in this

report. But other funding also exists such as self-funding, government grants and loans, amongst others. Small businesses (employing between 0-19 employees) represent the highest share of businesses reporting a lack of additional funds as a barrier to innovation. This is not surprising, with large businesses (200+ employees) having scale and ability to secure funds more easily than smaller businesses.

By state, across all business sizes, WA represent the lowest share of businesses reporting a lack of access to funds as a barrier to innovation. That said, the share reporting funding as a barrier still sat at almost 16 per cent and points to more work needing to be done to support innovative activities.

FIGURE 24

Share of businesses with lack of access to additional funds as a barrier to innovation, by employment size and by state, 2022-23



Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Innovation in Australian Business, 2022-23.

9.4 per cent of businesses in Victoria reported receiving financial assistance from government to support innovative activities. Western Australia and Queensland reported the lowest shares (7% each).

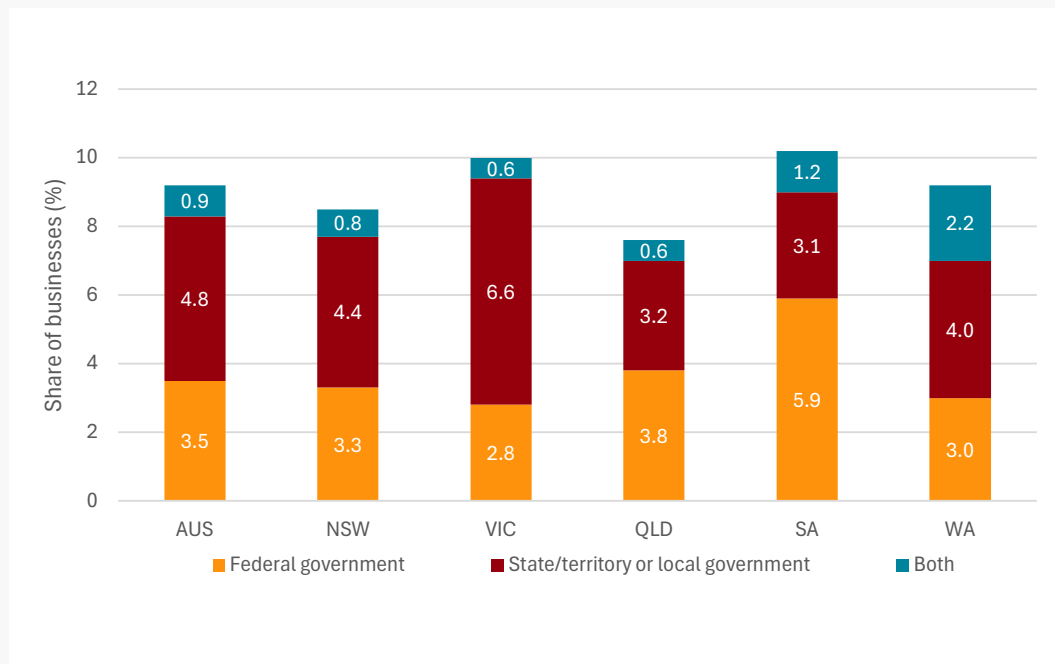
South Australia had the largest share of businesses (5.9%) that reported receiving financial assistance from the federal

government, whilst Victoria had the largest share of businesses that reported receiving state government financial assistance (6.6 per cent) in 2022-23.

WA had the largest share of businesses that accessed funding to support innovation from 'both the state and federal governments' (2.2%).

FIGURE 25

Share of businesses that reported receiving government financial assistance for innovative activities, by source of assistance, 2022-23



Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Innovation in Australian Business, 2022-23.



WA has had a relatively low rate of individuals leaving their jobs to launch a new business.

TALENT AND LEADERSHIP

Human capital, representing the collective knowledge, experience, and abilities of individuals, plays a pivotal role in driving entrepreneurship and fostering the establishment of new businesses (Stam and Van de Ven, 2021). Recognising its vast scope, human capital can be dissected into two main categories: general human capital, which covers universal skills and education, and entrepreneurship-specific human capital, focusing on skills directly influencing startup success.

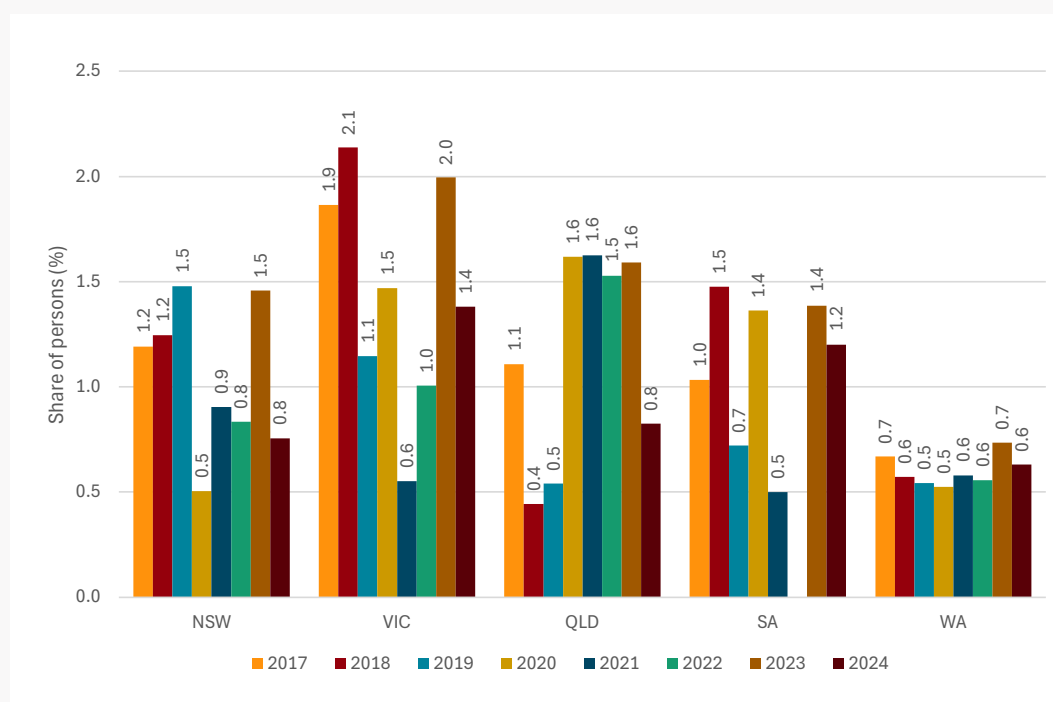
Before discussing general human capital, it is interesting to look at the share of persons leaving their previous job to start a new business. This is seen as one

measure of talent and leadership, but also a signal of innovation culture in the region. Not surprisingly, these numbers are low nationally. WA has had a relatively low rate of individuals leaving their jobs to launch a new business, sitting at 0.6 per cent of persons in 2024.

Victoria reported the highest share in recent years sitting at 1.4 per cent of persons in 2024 and 2.0 per cent in 2023. The lowest rates reported in WA need to be better understood. Factors such as highly paid work in existing businesses, cultural appetite for risk, access to funding and human capital skills, new ideas and capability may all be factors at play.

FIGURE 26

Share of individuals who left previous job to start a new business, by state, 2017 to 2024



Notes: Share of individuals who left their previous job primarily to start their own or a new business

Source: Bankwest Curtin Economics Centre | Authors' calculations from Participation, Job Search and Mobility, 2015 to 2024, Main reason for ceasing last job. TableBuilder.

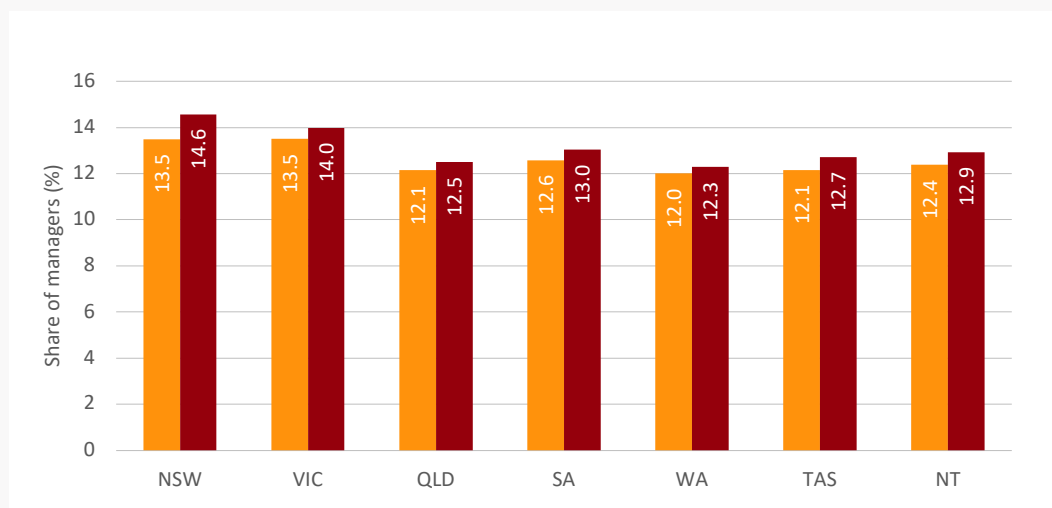
The share of persons employed as managers in an economy is another measure of skills available to support startups on their life course journey. Over the last two census periods, WA had the lowest share of managers across the states and territories. 12.3 per cent of the WA labour force were in a managerial role in 2021, compared to 14.6

per cent in NSW, the state with the largest share of managers across Australia.

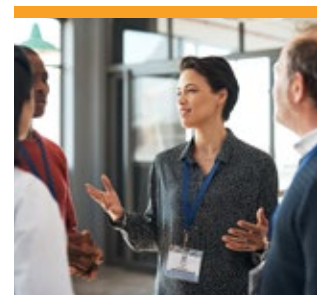
Furthermore, growth in managers in WA between 2016 and 2021 was also the slowest out of every state and territory, with just a 0.3 percentage point increase, compared to a 1.1 percentage point jump in NSW.

FIGURE 27

Share of managers in employed population by state, 2016 and 2021



Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Census of Population and Housing, 2016 and 2021, TableBuilder.



12.3% of the WA labour force were in a managerial role in 2021, compared to 14.6% in NSW.

WA also reported the lowest share of businesses using specialist skills to innovate across many of the skills categories reported in Figure 28.

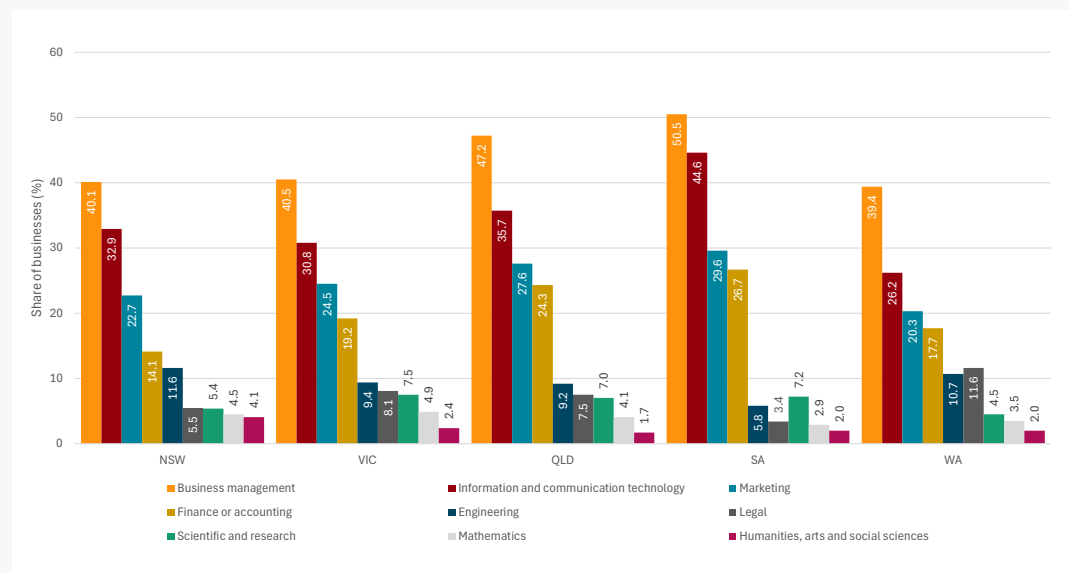
This includes a lower share of specialist skills used to innovate in areas such as business management, IT, and marketing as well as

finance and accounting skills and scientific and research skills.

WA was better positioned in engineering and legal skills. The level of engineering specialist skills in WA is not a surprising finding given the level of engineering expertise employed in the resources sector.

FIGURE 28

Specialist skills used to innovate by state, 2022-23



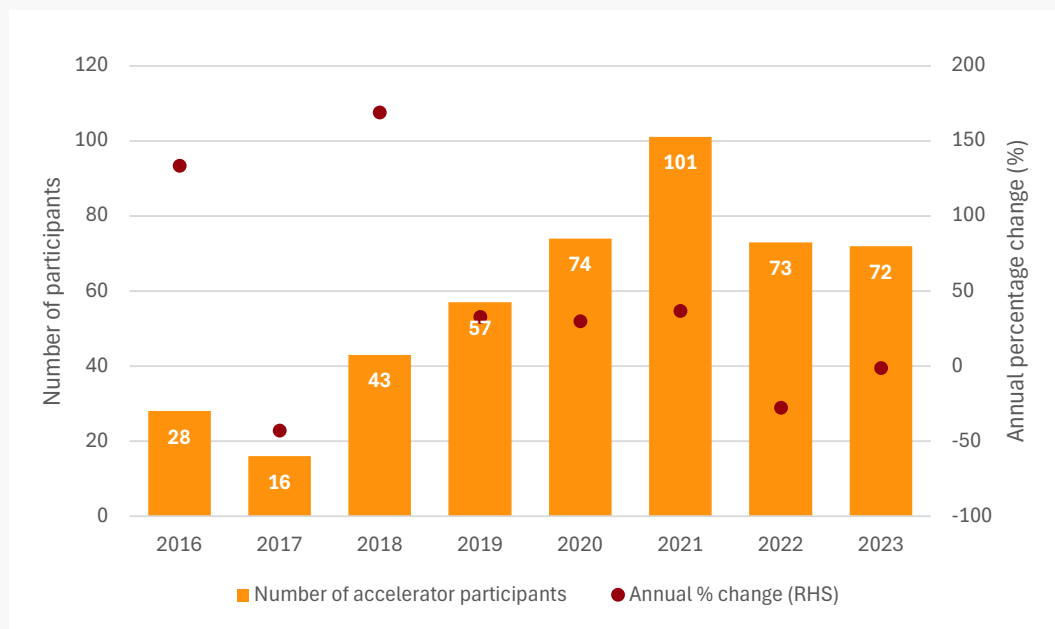
Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Innovation in Australian Business, 2022-23.

The number of accelerator participants in WA, as reported on the WA Innovation Ecosystem Index, grew at a steady pace between 2017 (from a low of 16 participants) and 2021 (to a high of 101 participants), before declining to 73 participants in 2022.

Such programs are critical to building the skillsets of entrepreneurs, supporting the acceleration of good ideas and developing supportive business models.

FIGURE 29

Number of accelerator participants in WA, 2016 to 2023



Notes: Based only on data reported on the WA Innovation Ecosystem Index, September 2024.

Source: Bankwest Curtin Economics Centre | as reported on the WA Innovation Ecosystem (Meshpoints).



Just 33% of working-age adults in WA hold a bachelor-level degree or above, compared to 41% in VIC.

Key indicators for general human capital related to innovation include the proportion of the population with tertiary education and the engagement of the working age population in ongoing learning or training initiatives.

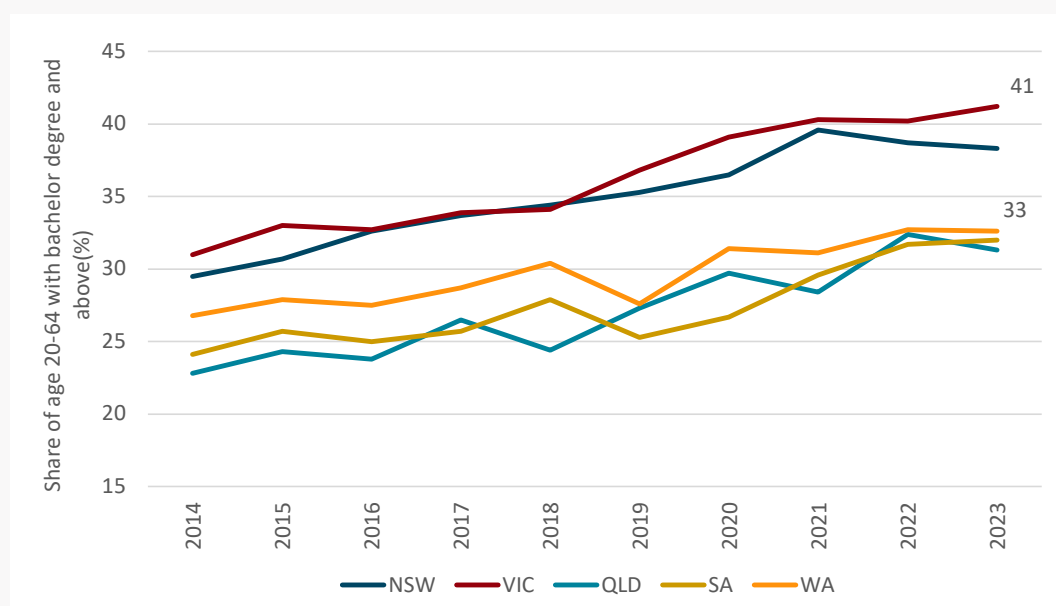
Victoria has the highest share of bachelor-level degree holders at 41 per cent of working-age adults. This compares to just 33 per cent of working-age adults in WA

(Figure 30). WA sits slightly above QLD and SA on this metric.

There is no doubt that these lower rates of tertiary education align with the relatively large number of businesses that reported struggling to find skilled workers as a barrier to innovation, both in WA and in other jurisdictions. WA's industry composition, with a heavy mining and construction focus is also a factor at play.

FIGURE 30

Proportion of persons with a bachelors-level degree or above, aged 20 to 64 years: 2014 to 2023



Source: Bankwest Curtin Economics Centre | Using data from ABS, Education and Work.

Migration system – pathways for entrepreneurs

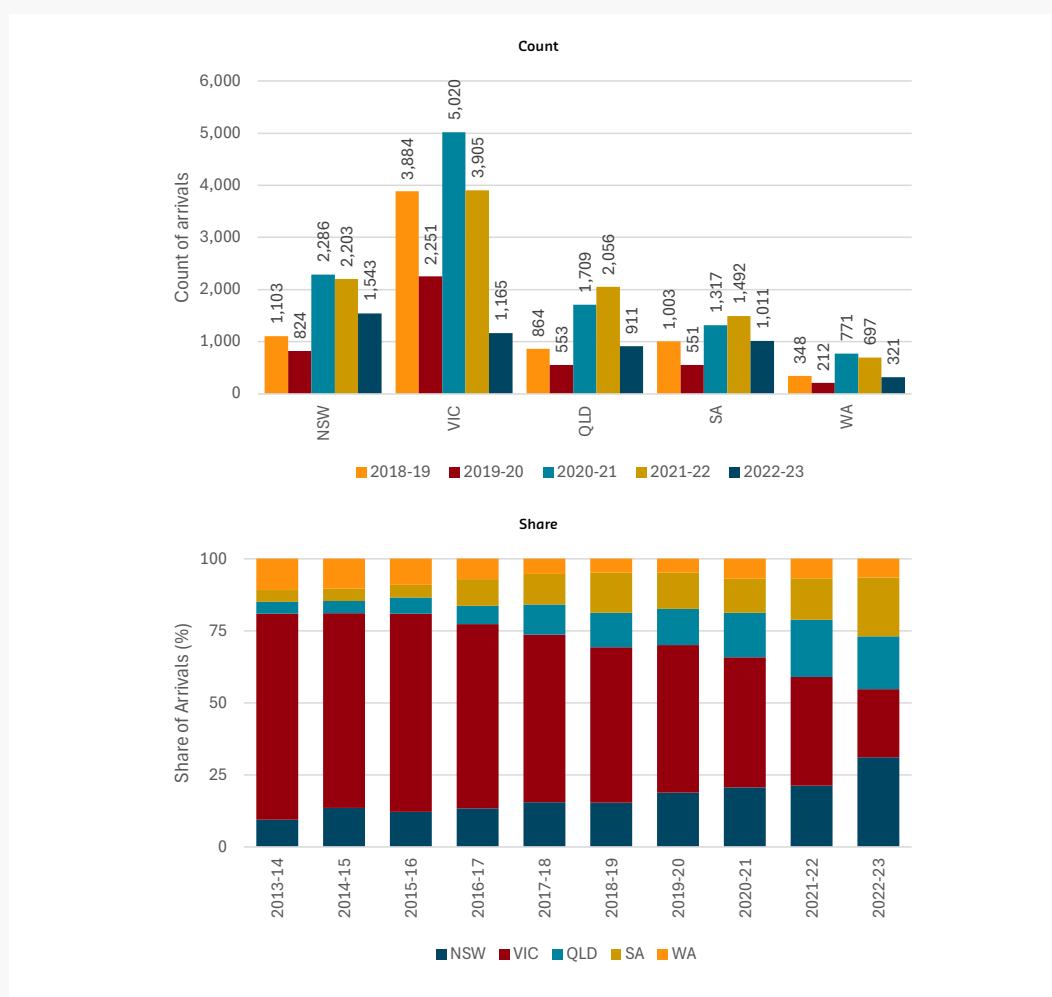
While the Business Innovation and Investment Program (BIIP) closed permanently to new applications in July 2024, it is interesting to look at the trends and distribution of this visa by state. This visa pathway was offered to prospective entrepreneurs arriving from overseas enabling them to conduct business and investment activity in Australia.

Relative to other states, WA obtained 5.2 per cent of such visa recipients between 2018-19 and 2022-23. This compares to WA's share of the national population sitting at 10.9 per cent.

And, WA had the lowest count of arrivals on the entrepreneurial visa out of the five major states in 2022-23, with just 252 arrivals. Overall, 2022-23 saw less arrivals on the visa than in previous years across all states and territories, compared to the peak recorded in 2021-22.

FIGURE 31

Business innovation and investment visas, by state, 2013-2023



Source: Bankwest Curtin Economics Centre | Authors' calculations from Department of Home Affairs, Migration Program, Expert Panel (Family) and Child Outcomes since 2013-14 pivot table.



Growing the number of people in knowledge intensive sectors will further support innovation.

INTERMEDIATE SERVICES

Intermediate services help reduce entry barriers for new ventures and shorten the time it takes to bring innovations to market. These services enhance startup success by offering critical resources, mentorship, and guidance. One measure of intermediate services is the share of persons working in knowledge intensive service industries – those seen to support startups.

Until very recently, WA had the lowest share of persons working in knowledge intensive service industries out of the five major

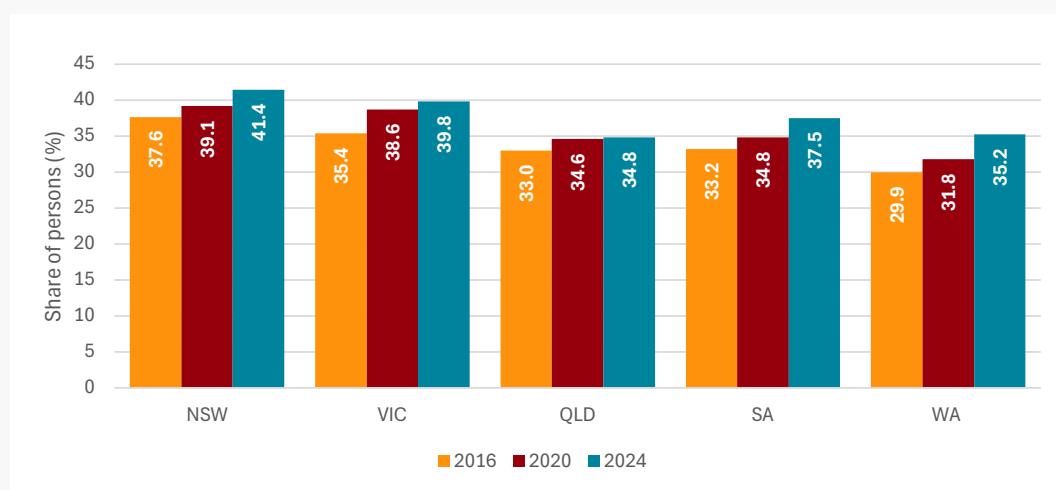
states. However, in 2024 this share (35.2%) rose slightly above QLD (34.8%).

The share of persons in these industries across Australia has consistently risen over time for each state, with NSW sitting on top with 41.4 per cent followed by VIC (39.8%).

Growing the number of people in knowledge intensive sectors will further support innovation and provide the supports startups require across WA, with more effort needed to catch up with the eastern states.

FIGURE 32

Share of people employed in knowledge intensive service industries, 2016 to 2024



Note: Knowledge intensive service industries: Information media and telecommunications, financial and insurance services, professional, scientific and technical Services, education and training, health care and social assistance.

Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS 6291.0.55.001 Labour Force, Australia, Detailed Table 05.

NEW KNOWLEDGE

The generation of new knowledge through private or public sector research and development (R&D) emerges as a vital driver of entrepreneurship. By analysing the R&D expenditure relative to the total Gross Regional Product (GRP), a clear link can be established between investment in knowledge creation and the creation of new business opportunities.

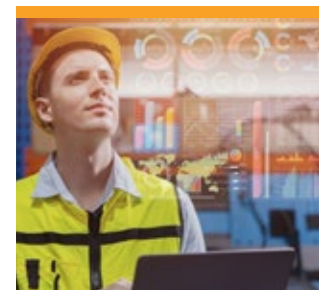
Business expenditure on Research and Development

Dedicating resources towards R&D is a critical strategy for many businesses, allowing them to develop new and innovative technologies to get ahead of the competition. R&D expenditure across Australia has varied over time between 2017-18 and 2021-22.

NSW is the largest state in terms of R&D expenditure (\$7.2 billion), even on a per capita basis (\$886 per capita), though VIC (\$847 per capita) and WA (\$807 per capita) are not far behind (Figure 33).

R&D spending across Australia is generally diversified, with no single industry having a monopoly over funding. In NSW, professional and scientific services are the largest industries in terms of funding (\$2.6 billion) whilst in VIC manufacturing has a larger share (\$1.8 billion).

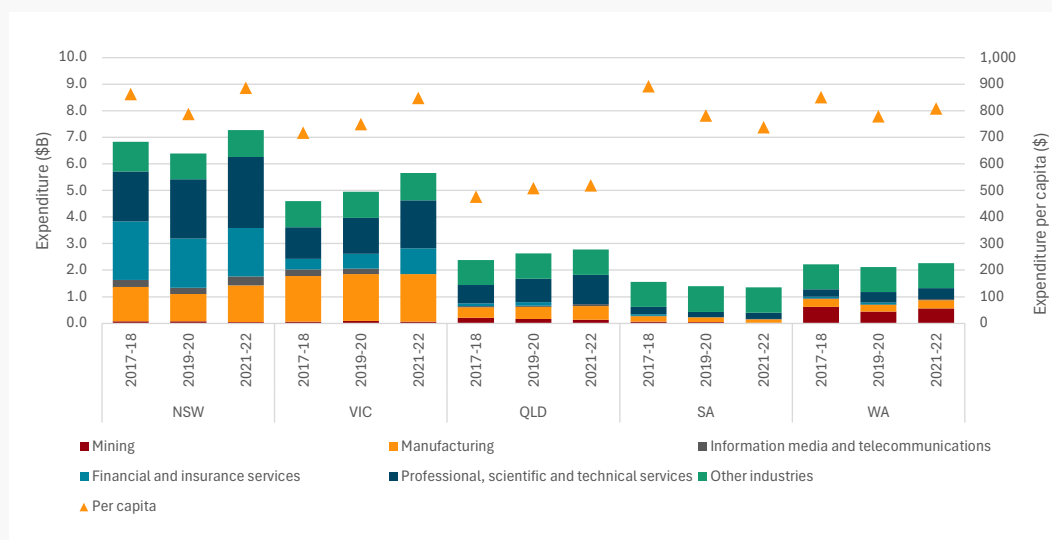
25 per cent of R&D expenditure by businesses in WA is in the mining industry, sitting at \$565.5 million of the overall \$2.27 billion spent in 2021-22.



25% of R&D expenditure by businesses in WA is in the mining industry.

FIGURE 33

Business expenditure on R&D, by industry and state, selection of years



Notes: Includes funding from joint business/government, higher education and private non-profit organisations.

Source: Bankwest Curtin Economics Centre | Authors' calculations ABS Research and Experimental Development, Businesses, Australia, 2017-18, 2019-20 and 2021-22.



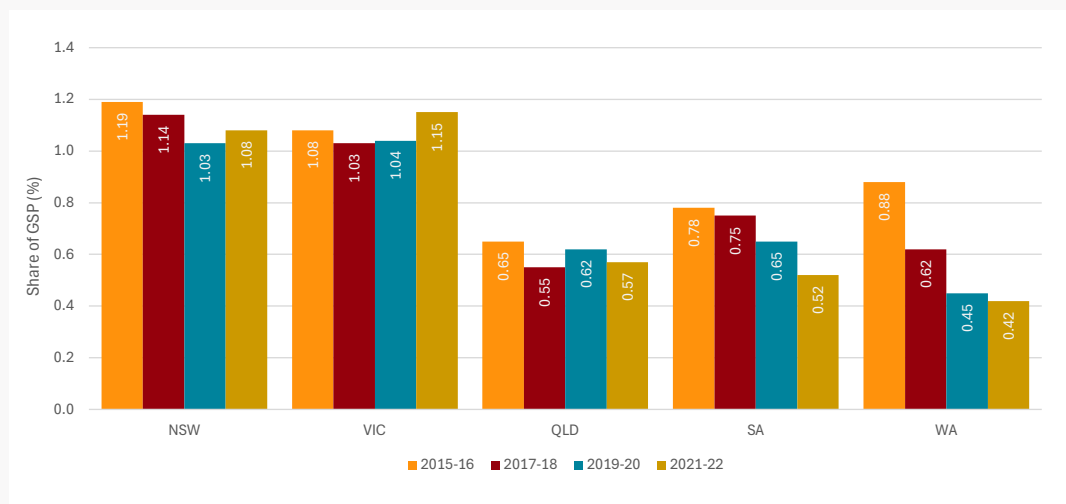
In WA, business R&D spend as a share of GSP sat at 0.42% in 2021-22, the lowest across the states.

Whilst business R&D expenditure on a per-capita basis has remained relatively stable over time, when looking at this expenditure as a share of Gross State Product (GSP), it has declined in most states between 2015-16 and 2021-22. Victoria is the exception, where business R&D spend as a share of GSP rose from 1.08 per cent to 1.15 per cent.

In WA, business R&D spend as a share of GSP declined from 0.88 per cent in 2015-16 to 0.42 per cent in 2021-22, the lowest across the states reported.

FIGURE 34

Business expenditure on R&D as a share of GSP, by state, 2015-16 to 2021-22



Notes: Includes funding from joint business/government, higher education and private non-profit organisations.

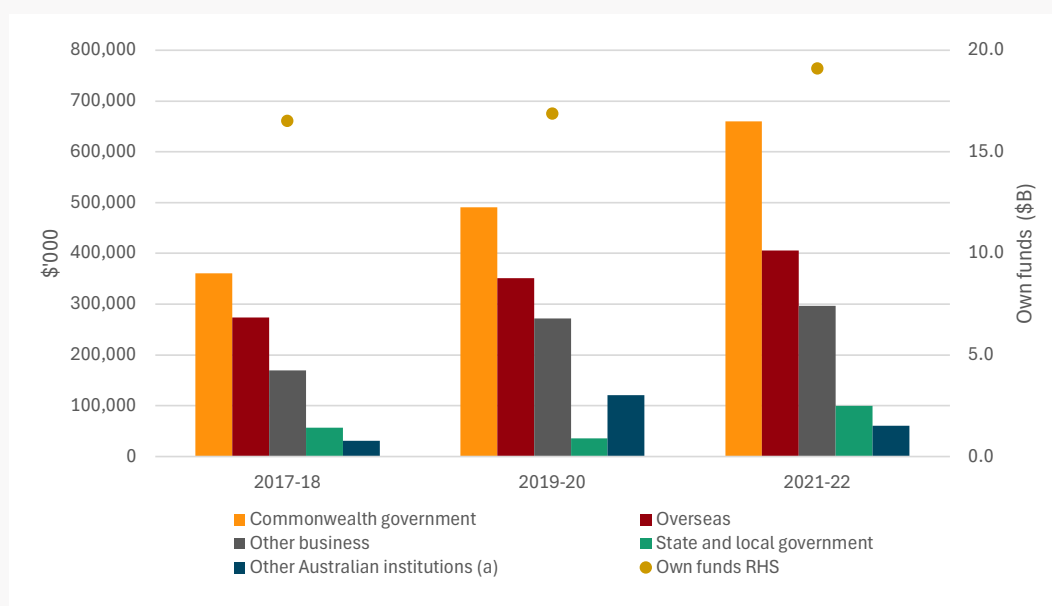
Source: Bankwest Curtin Economics Centre | Authors' calculations ABS Research and Experimental Development, Businesses, Australia 2021-22 financial year.

Overall, the primary source of funding for business R&D expenditure is from the researching businesses themselves. Outside of that, the federal government is the most prolific investor in business R&D, followed

by overseas investors and other businesses. State and local governments, as well as other Australian institutions, do not invest much in R&D activity.

FIGURE 35

Business expenditure on R&D, by source of funds, Australia, 2017-18 to 2021-22



Notes: Includes funding from joint business/government, higher education and private non-profit organisations.

Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Research and Experimental Development, Businesses, Australia. Table 1 Business expenditure on R&D.



Universities are a critical source of R&D expenditure.

Higher education resources devoted to R&D

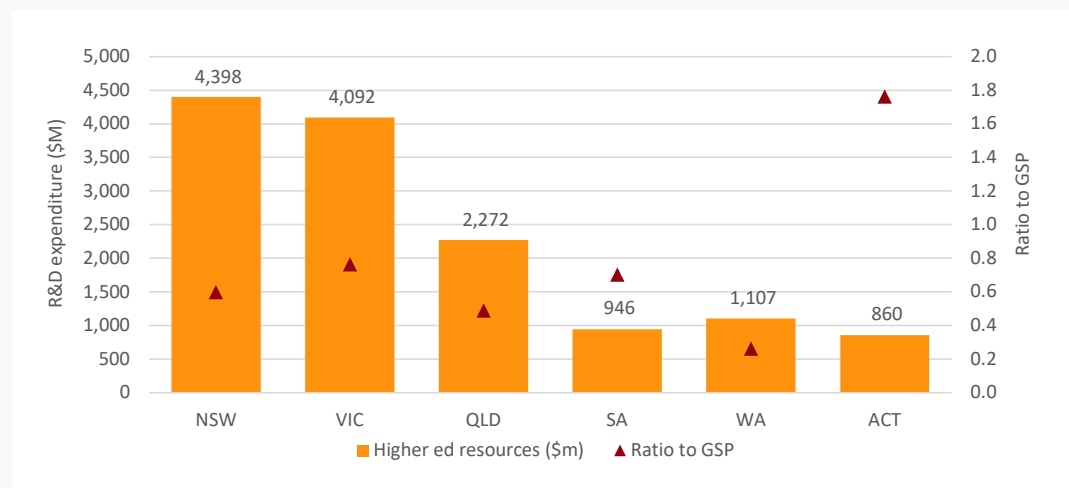
Outside of private businesses, universities are a critical source of R&D expenditure into new and innovative technologies and processes. Total R&D funding in higher education organisations was just under \$14 billion nationally in 2022. NSW and VIC are relatively close in the amount of university raw R&D investment, but when compared to GSP, VIC slightly outpaces NSW.

In dollar terms, WA university investment compares favourably to SA and ACT, but in terms of the expenditure as a share of GSP, it is lowest across the states. The sheer scale of WA's GSP relative to the number of universities is of course a factor at play.

ACT, whilst outside of the five major states, is known to be a major tertiary education hub for Australia, with the share of R&D spending relative to GSP in the territory greatly outpacing that of other states and territories.

FIGURE 36

Higher education resources devoted to R&D by state, 2022



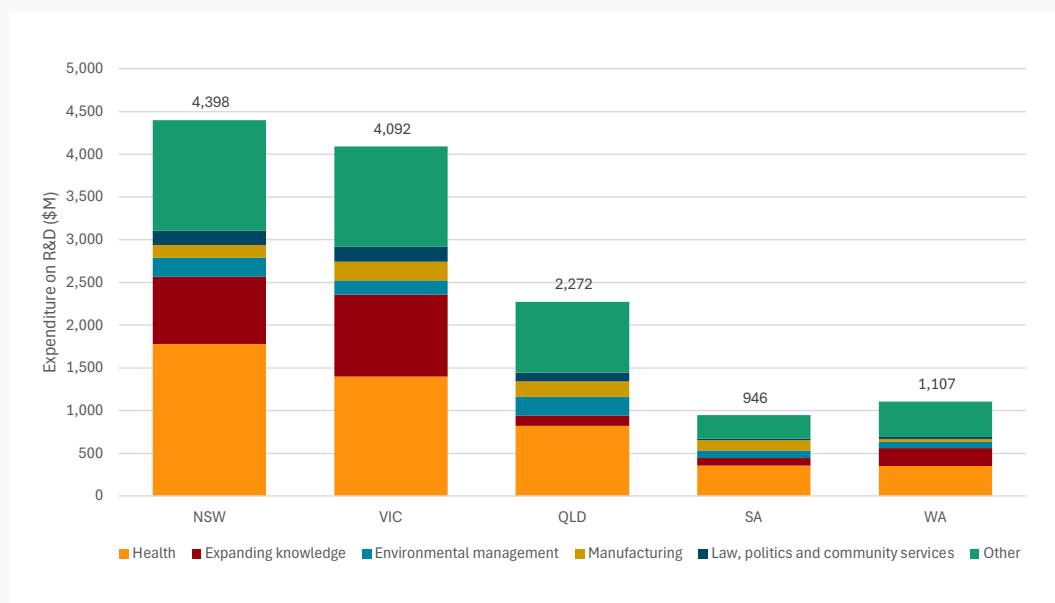
Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Research and Experimental Development, Higher Education Organisations, Australia, 2022.

It is of interest to see how higher education R&D investment is spent by major socioeconomic objective. The top five socioeconomic objectives – health, expanding knowledge, environmental management, manufacturing and law – make up over 68 per cent of the total R&D expenditure by higher education institutions. Of these,

R&D spend on health-related areas is the most prevalent across the five major states (Figure 37). NSW, VIC, and WA also invest a significant amount into general knowledge expansion, whilst QLD, NSW and VIC invest sizeable amounts into environmental research and manufacturing.

FIGURE 37

Higher education resources devoted to R&D by top five socioeconomic objectives, by state, 2022



Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Research and Experimental Development, Higher Education Organisations, Australia, 2022.



National expenditure on R&D as a share of GDP is at 1.8% in Australia, while the OECD average is 2.6%.

Higher education spending on R&D in WA displays the same top three socioeconomic objectives as those reported nationally, but energy and mineral resources come in ranked fourth and fifth respectively. This speaks to WA's heavy focus on the resources industry, and comparative advantages in this area. These are critical growth areas for the economy and will become even more important with the opportunities presented through global decarbonisation and the state's capabilities and natural resources to feed into such agendas.

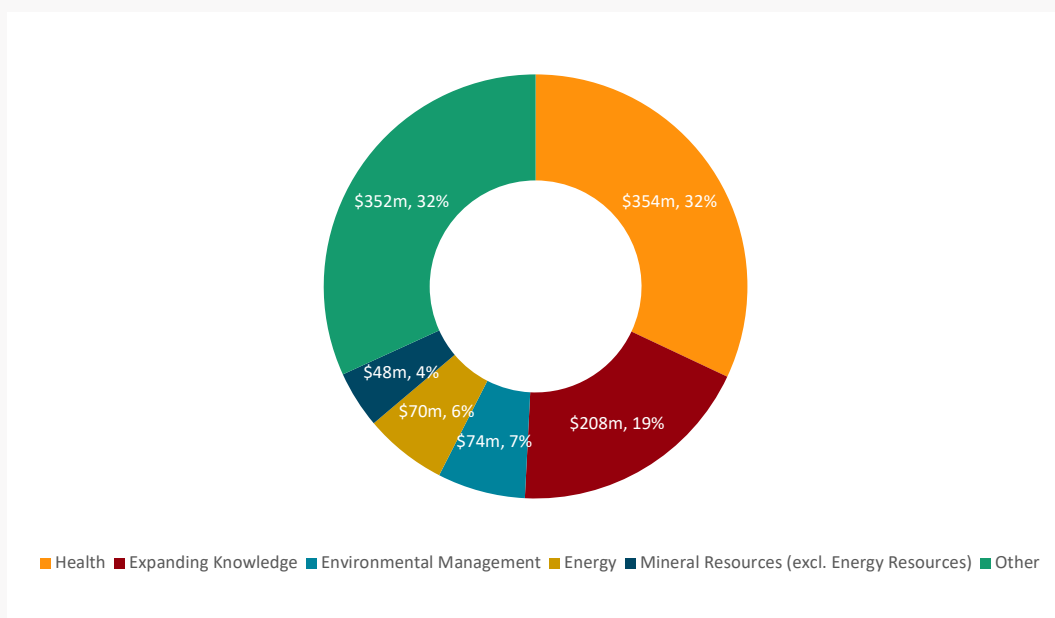
Regardless, further investment in R&D will be essential to enhance global competitiveness. Australia invests less in R&D compared to other developed countries. National expenditure on R&D as a share of gross domestic product is at 1.8 per cent in Australia, while the OECD average is 2.6 per

cent. This figure is as high as 5.6 per cent in Israel, 3.5 per cent in the USA and 3.1 per cent in Germany.

Representative bodies from Australia, such as the Group of Eight Universities, have argued that a more integrated approach to research between universities and industry is required. In the 2024 budget, the federal government announced that it will undertake a strategic examination of Australia's R&D system. This is welcome but government cannot provide all the solutions - industry also needs to be included in such examinations. A better understanding of the barriers and required incentives for industry to engage in further R&D, including fostering collaborations with research institutions, is needed. R&D is a critical piece of the jigsaw to ensure the success of the new and emerging industries in Australia.

FIGURE 38

Higher education resources devoted to R&D by top five socioeconomic objectives, WA, 2022



Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Research and Experimental Development, Higher Education Organisations, Australia, 2022.

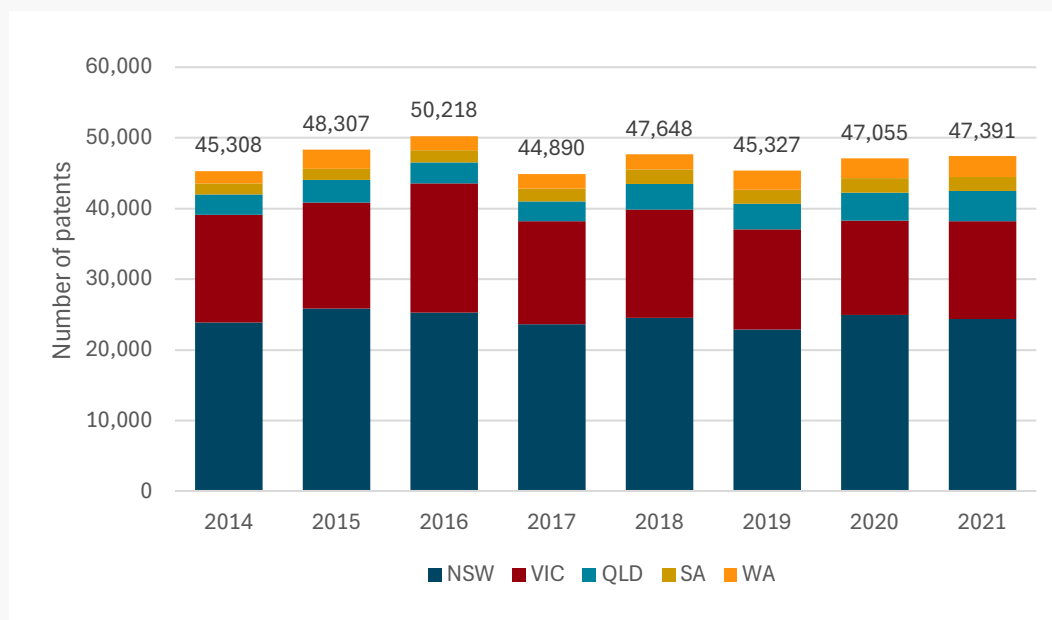
Patents

Patent applications and acquisitions are an important measure of innovation activity. The number of annual patent applications in Australia has remained fairly consistent over time, with some minor swings on a state-by-state basis.

NSW, with 24,346 patent applications in 2021, is consistently Australia's leading state in terms of patent applications, followed by VIC (13,869), QLD (4,293), and WA (2,971). SA (1,912) reported the lowest count of patent applications in 2021.

FIGURE 39

Total patent applications in Australia by state, 2014 to 2021



Notes: Total patent applications (direct and PCT national phase entries). Data as of December 2023.

Source: Bankwest Curtin Economics Centre | Authors' calculations from WIPO IP Statistics Data Centre.



NSW is consistently Australia's leading state in terms of patent applications.



About 5.7% of innovation active businesses in WA report activity related to the acquisition of patents.

Commercialisation

Commercialisation is the process of bringing new products and services to market. It involves various activities from production, distribution, marketing, and sales, as well as IP rights and customer supports.

In terms of innovating businesses, SA enterprises lead in the share engaged in market research activities related to commercialisation (35.7%), while reporting the smallest share of marketing skills training activities. Contrastingly, businesses in WA hold the lowest proportion

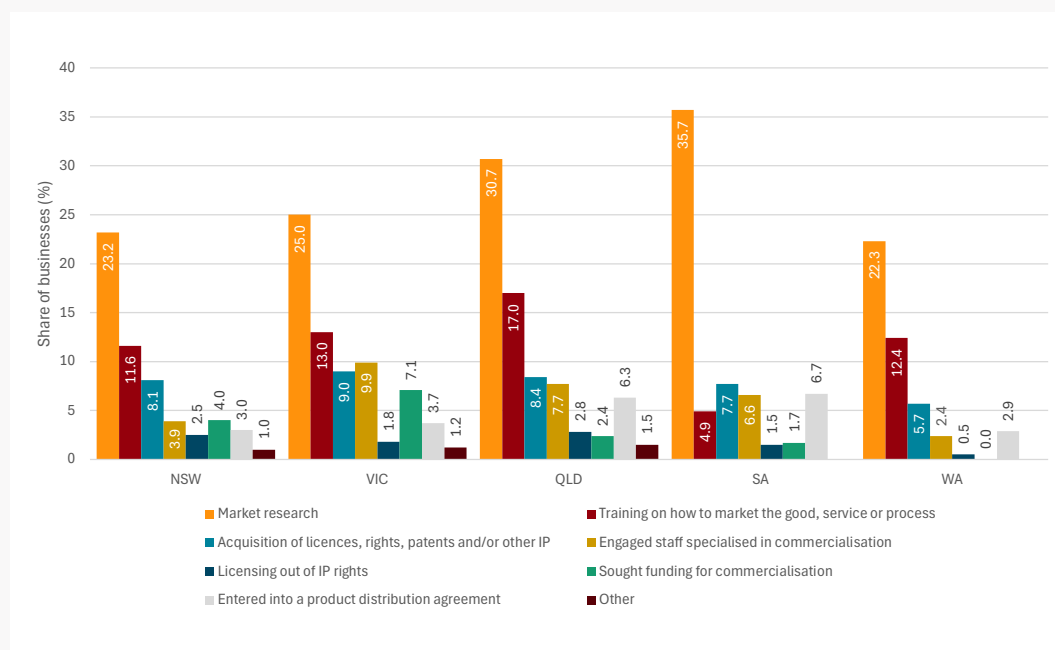
of market research activities related to commercialisation but demonstrate a relatively significant commitment towards training.

In terms of acquisition of licenses, rights and patents, engaging specialised staff, and securing funding for commercialisation, VIC ranks on top, outperforming NSW, QLD, SA and WA.

About 5.7 per cent of innovation active businesses in WA report activity related to the acquisition of patents.

FIGURE 40

Commercialisation activities by state, share of businesses reporting by activity type, 2022-23

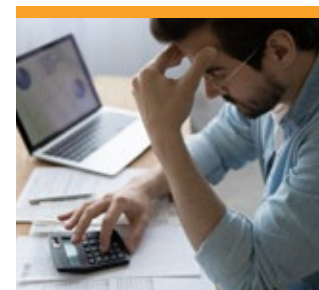


Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Innovation in Australian Business, 2022-23.

Insufficient funding is the most significant barrier for commercialisation of research across all states, but with varying magnitudes. Accessing and securing finance is reported as the largest barrier by QLD, followed by NSW, VIC, SA, and WA. It should be noted that while WA faces challenges in securing funding, other states report much higher levels of limited funding.

The Australian government is looking to encourage further commercialisation activities, focusing on supply-side policies such as providing businesses with an R&D tax rebate through the National Reconstruction Fund to promote innovation.

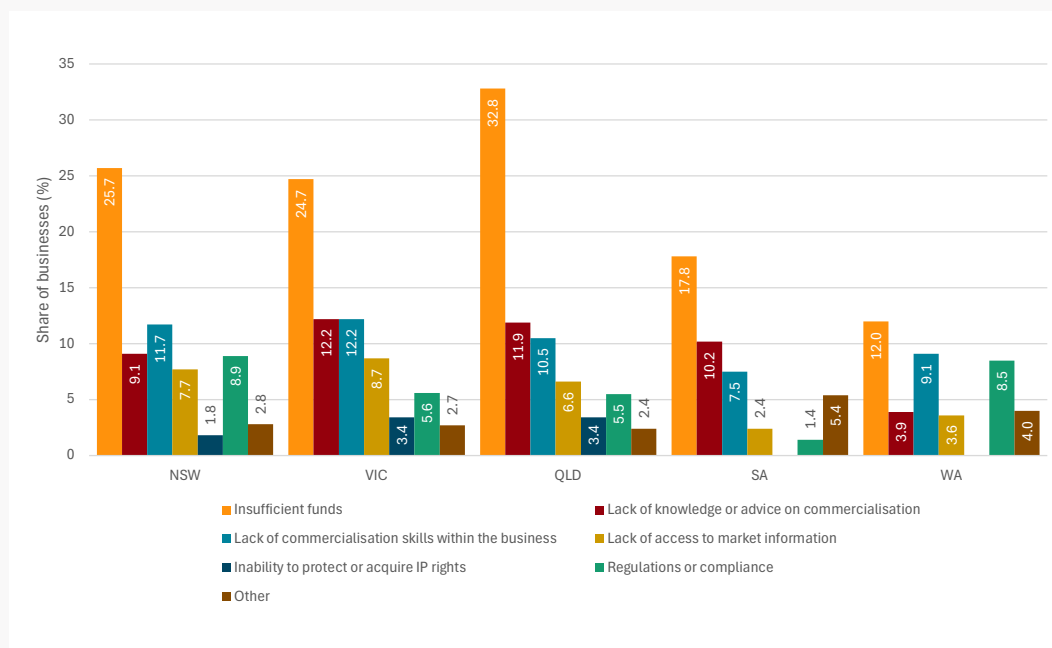
Businesses in WA identify lack of skills within the business and legal regulations as the other two major challenges to commercialisation. Notably, only 3.9 per cent of the businesses state limited understanding of commercialisation as a constraint to commercialisation in WA. In contrast, a significantly larger number of businesses in other states report lack of advice on commercialisation as an obstacle. These findings highlight the need for support in terms of finance and training.



Businesses in WA identify lack of skills within the business and legal regulations as the other two major challenges to commercialisation.

FIGURE 41

Barriers to commercialisation by state, share of businesses reporting, by type, 2022-23



Notes: No data available for 'inability to protect or acquire IP rights' for SA and WA.

Source: Bankwest Curtin Economics Centre | Authors' calculations from ABS Innovation in Australian Business, 2022-23.

"IN AN
**ENTREPRENEURIAL
ECOSYSTEM**, THE
FOCUS IS ON THE
INTERDEPENDENT
RELATIONSHIPS
BETWEEN DIFFERENT
ACTORS, AND HOW
THESE INTERACTIONS
NURTURE OR HINDER
THE GROWTH OF
STARTUPS."



QUANTIFYING THE ENTREPRENEURIAL ECOSYSTEM



New venture creation heavily depends on the resources and conditions available to entrepreneurs in specific locations.

ELEMENTS OF THE ENTREPRENEURIAL ECOSYSTEM

Startup and new venture creation is receiving increasing attention with many experts characterising it as a vital element of a well-functioning modern economy. New firms do not emerge in a vacuum. Their creation heavily depends on the resources and conditions available to entrepreneurs in specific locations.

This study quantifies the entrepreneurial ecosystem by examining the various interdependent factors that drive and sustain entrepreneurial activity. Building on previous research (Stam and Van de Ven, 2021; Leendertse *et al.*, 2022), this report identifies ten critical components essential for fostering new venture creation and innovation.

These ten elements are formal institutions, entrepreneurship culture, networks, physical infrastructure, finance, leadership, talent, new knowledge, demand and intermediate services. Each of these factors plays a unique role in creating a supportive environment where startups and new businesses can develop and thrive. Some variables related to these elements were discussed in detail in the previous chapter of this report. This approach is also in line with the WA government Innovation Strategy targeting key priority action areas that are directly linked to these key elements.

In order to capture the complexity and multifaceted nature of these elements of the ecosystem, this study compiles a comprehensive dataset at the Statistical Area Level 2 (SA2) across Australia¹, providing a detailed representation of the ecosystem's elements.

A descriptive analysis of these indicators reveals a great deal of variation across these

elements (refer to appendix Table 9). While SA2 areas, on average, have strong business networks (at around 60%), most businesses in these areas face significant challenges in securing funding, as the average score for finance is only at 2 per cent.

This variation in the availability and quality of ecosystem elements highlights disparities in how conducive different regions are for entrepreneurial activity. Regions strong in one element but weak in others might still face challenges in fostering a vibrant startup ecosystem, as all factors play interconnected roles in success.

The interdependence of the ecosystem's elements

Since all these factors are crucial for new venture creation and innovative activities, it is expected that the elements of the ecosystem are closely interrelated. To explore whether such interdependence exists, two specific analyses are conducted.

First, a correlation matrix investigates the interconnectedness between the elements of the ecosystem (refer to appendix Table 11). This shows strong, positive, and significant correlations among all the elements of the ecosystem. Specifically, 8 out of the 10 elements show high correlations, scoring above 0.2, with at least 7 of the other elements. These findings suggest that entrepreneurial ecosystems are interconnected and work as a system.

Second, principal component analysis (PCA) further explores these interdependencies. An advantage of this method is that it does not assume that all elements are of equal importance to the entrepreneurial

¹ There are 2,473 SA2s covering the whole of Australia. See <https://www.abs.gov.au/statistics/standards/australian-statistical-geography-standard-asgs-edition-3/jul2021-jun2026/main-structure-and-greater-capital-city-statistical-areas/statistical-area-level-2> for more information.

ecosystem as each element is assigned a different loading. PCA analysis reveals that all elements are of great importance, as they receive high loadings (Figure 42).²

Elements are also grouped based on their loadings and fall into three main clusters. The first cluster includes intermediate services and talent. The second cluster brings together knowledge, physical infrastructure, leadership, and finance. The third cluster consists of formal institutions, demand, networks, and entrepreneurship culture. This clustering technique reinforces

the results obtained from the correlation matrix, which indicate that the various components of the entrepreneurial ecosystem are closely interconnected.

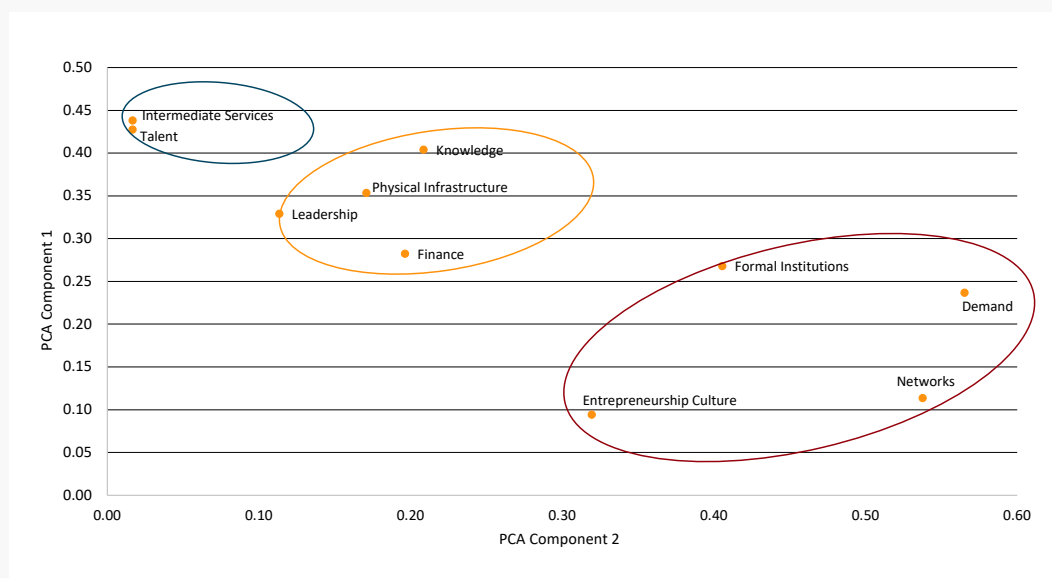
Furthermore, results indicate that certain elements, such as knowledge, physical infrastructure, and finance, are particularly pivotal in driving the overall effectiveness of the ecosystem in Australia.³ This suggests that these central factors significantly contribute to a more robust environment for entrepreneurial activities.



Entrepreneurial ecosystems are interconnected and operate as a system.

FIGURE 42

Principal component analysis, elements of the entrepreneurial ecosystem index



Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

² A detailed description of the PCA analysis is provided in the appendix, refer to Table 12.

³ These results are derived from the first and second components of the PCA analysis.



Greater Perth
ranks 5th in the
entrepreneurial
ecosystem index.

ENTREPRENEURIAL ECOSYSTEM INDEX

Through aggregation of the key indicators for the ten key elements this report creates an overall *entrepreneurial ecosystem index* which assesses the overall quality of the ecosystem in each SA2 area across Australia. A detailed description of the entrepreneurial ecosystem index construction is provided in the appendix.

First, this study ranks Australia's greater city areas using the entrepreneurial ecosystem index. Sydney tops the list, followed by Melbourne in second place, with Brisbane coming in third. Adelaide ranks fourth, while Perth takes fifth place

(Table 3). These rankings align with findings from other studies that have similarly ranked Australian cities based on their entrepreneurial ecosystems.⁴

The BCEC's estimates of the entrepreneurial ecosystem index are generated at a highly granular level, specifically at the small SA2 area scale, offering detailed insights into small regions across Australia. Thus, this report provides valuable information for local governments and city councils, helping to shape targeted strategies to support entrepreneurial and startup activities in each area.

TABLE 3

Greater city areas ranking based on the entrepreneurial ecosystem index scores

Ranking	Greater City Areas
1	Sydney
2	Melbourne
3	Brisbane
4	Adelaide
5	Perth

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

⁴ See, for example, the Global Startup Ecosystem Report (2024) at <https://startupgenome.com/reports/gser2024>.

In order to develop WA's entrepreneurial ecosystem, it is important to identify overall index rankings as well as the contribution of elements of the ecosystem.

To do this, Perth's performance across the ten elements of the ecosystem is compared

with the average scores for other major Australian cities. Analysis reveals that while Greater Perth performs well in terms of demand, it lags in all the other elements (Figure 43).

FIGURE 43

Elements of the entrepreneurial ecosystem, Australia and Greater Perth



Notes: All indicators are normalised to range between a minimum of zero and a maximum of one. The scores for Australia are equal to the average across all greater city areas.

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.



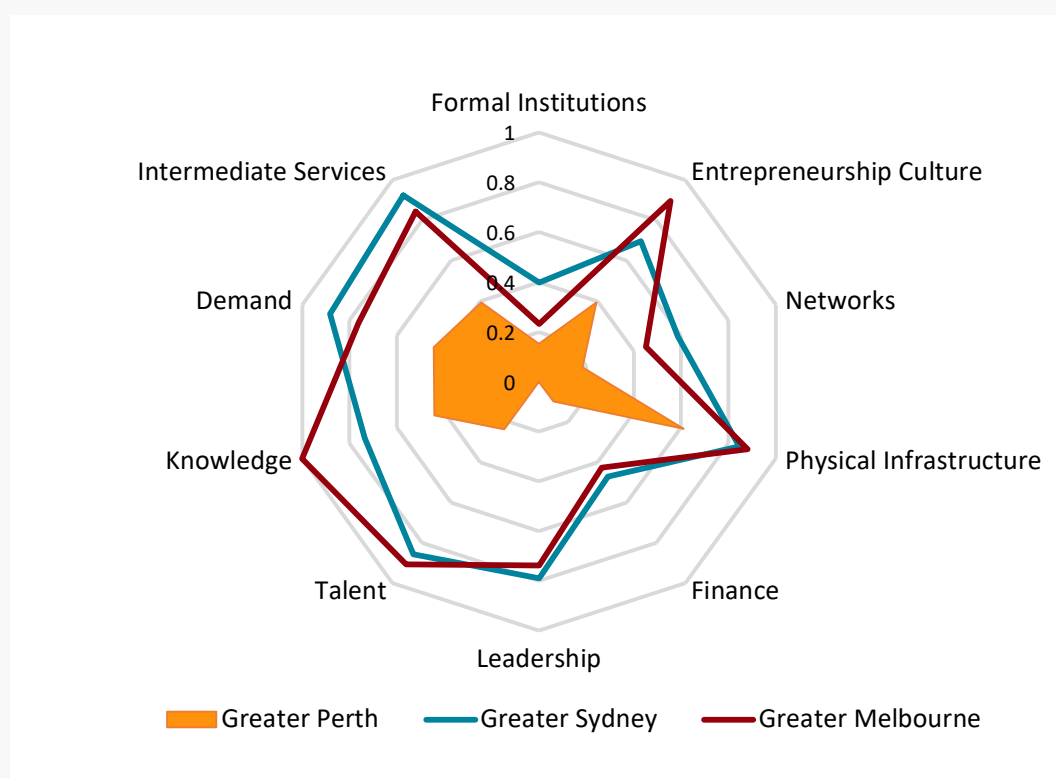
Greater Perth lags behind both Greater Sydney and Greater Melbourne across all ecosystem elements.

Perth's entrepreneurial ecosystem is also compared with Australia's top two cities, Sydney and Melbourne. Figure 44 shows that Greater Perth lags behind both Greater Sydney and Greater Melbourne across

all ecosystem elements. While the gap is smaller for elements like formal institutions, it is notably larger for leadership, talent, and knowledge, highlighting areas where Greater Perth falls significantly short.

FIGURE 44

Elements of the entrepreneurial ecosystem, Greater city areas, Sydney, Melbourne and Perth



Notes: All indicators are normalised to range between a minimum of zero and a maximum of one. The scores for Australia are equal to the average across all greater city areas.

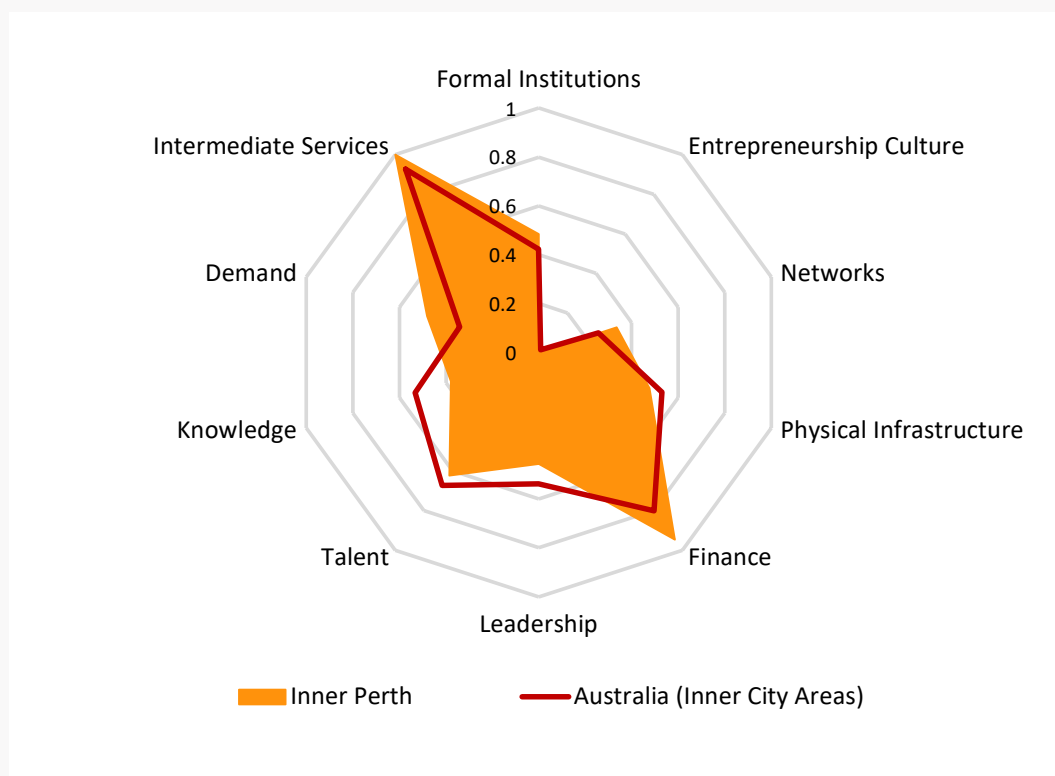
Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

However, when the comparison is narrowed down to just the Perth inner city and other inner cities across Australia, results reveal a more positive outcome. Inner Perth matches or surpasses the average scores in 7 out of the 10 elements (Figure 45). Despite this,

Perth inner city still lags in key areas like knowledge, talent, and leadership, indicating specific areas where further development is needed to strengthen the entrepreneurial ecosystem.

FIGURE 45

Elements of the entrepreneurial ecosystem, Australia and inner Perth



Notes: All indicators are normalised to range between a minimum of zero and a maximum of one. The scores for Australia are equal to the average across all inner city areas.

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.



Perth's inner city area surpasses the average scores for other inner city areas nationally.



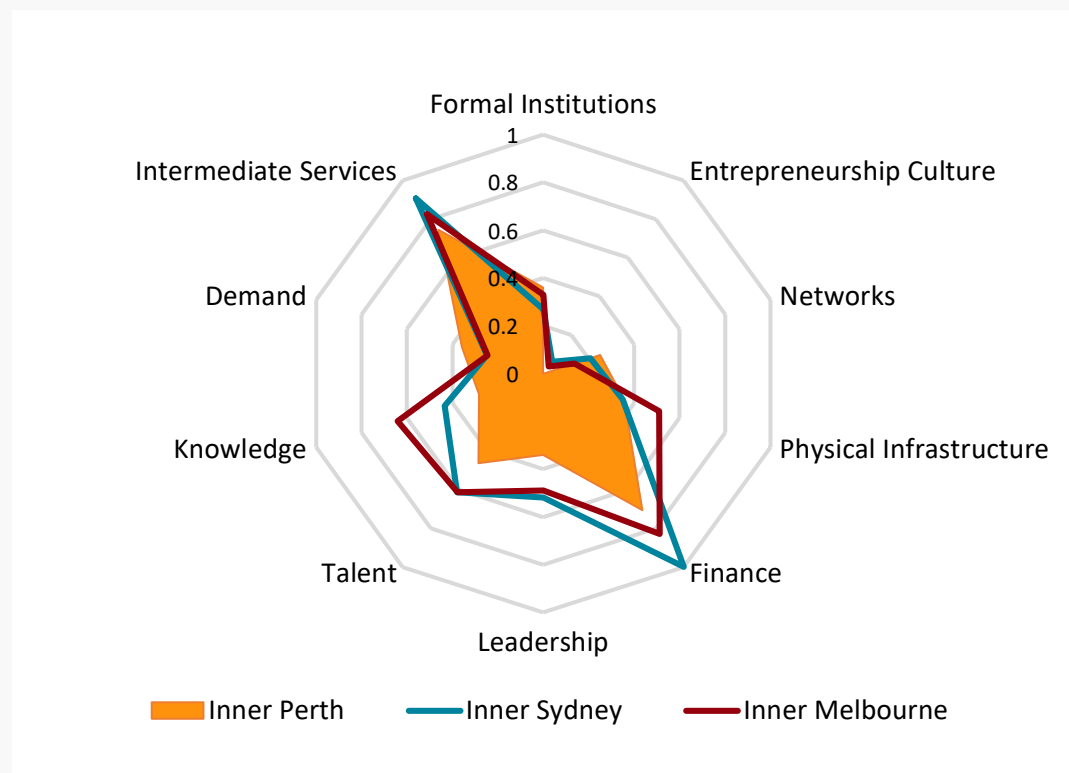
Perth inner city compares well with Sydney and Melbourne inner cities in several areas but still lags in new knowledge, talent, and leadership.

Perth inner city does well even in comparison to the inner city areas of Melbourne and Sydney. Perth inner city is comparable to the inner cities of Sydney and Melbourne in formal institutions, intermediate services, entrepreneurship culture, and networks (Figure 46). In fact,

Perth surpasses both cities in terms of demand with a strong GSP per capita and high household disposable income. However, Perth inner city still lags in new knowledge, talent, and leadership, pointing to key areas where further development is needed.

FIGURE 46

Elements of the entrepreneurial ecosystem, inner city areas, Sydney, Melbourne and Perth



Notes: All indicators are normalised to range between a minimum of zero and a maximum of one. The scores for Australia are equal to the average across all inner city areas.

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

When ranking Statistical Areas Level 4 (SA4)⁵ based on the entrepreneurial ecosystem index, Sydney City and inner South regions ranks first, followed by inner Melbourne, with inner Perth securing third place. SA4s in Brisbane and Adelaide

are also among the top 20, the former not surprising given the policies to build Brisbane's knowledge corridor and precincts. That said, most of the top 20 SA4 areas are occupied by areas in Sydney and Melbourne.

TABLE 4

Top 20 SA4 areas with the highest entrepreneurial ecosystem index scores in Australia

State	SA4	Entrepreneurial Ecosystem Index
NSW	Sydney - City and Inner South	14.3
VIC	Melbourne - Inner	13.0
WA	Perth - Inner	10.3
NSW	Sydney - North Sydney and Hornsby	10.0
QLD	Brisbane Inner City	8.9
NSW	Sydney - Eastern Suburbs	8.6
NSW	Sydney - Ryde	7.4
QLD	Brisbane - West	7.2
NSW	Sydney - Inner West	6.9
VIC	Melbourne - Inner East	6.5
SA	Adelaide - Central and Hills	5.5
QLD	Brisbane - South	5.5
VIC	Melbourne - Inner South	5.1
NSW	Sydney - Northern Beaches	4.6
QLD	Brisbane - North	4.4
NSW	Sydney - Baulkham Hills and Hawkesbury	3.4
NSW	Sydney - Sutherland	3.2
NSW	Sydney - Parramatta	2.9
VIC	Melbourne - West	1.9
NSW	Sydney - Inner South West	1.9

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.



Inner Perth (SA4) ranks 3rd in the entrepreneurial ecosystem index relative to similar sized regions nationally.

⁵ See for more information on SA4 areas <https://www.abs.gov.au/statistics/standards/australian-statistical-geography-standard-asgs-edition-3/jul2021-jun2026/main-structure-and-greater-capital-city-statistical-areas/statistical-area-level-4>.



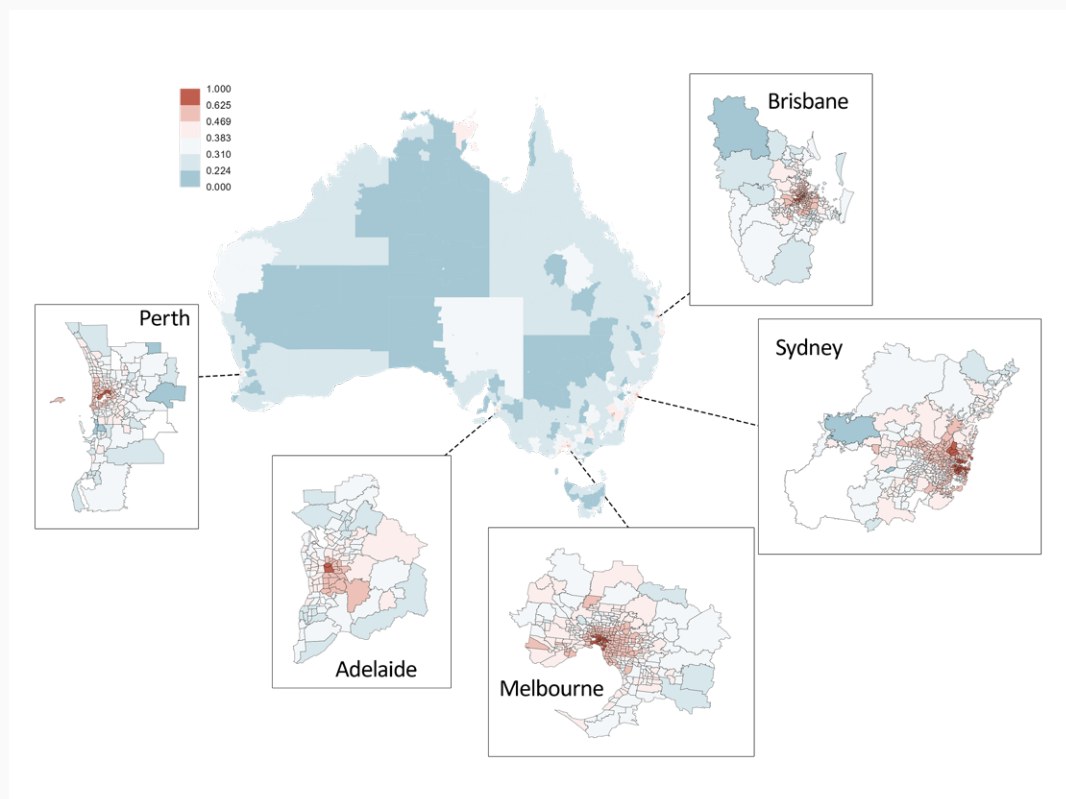
Higher index scores are evident in areas close to city centres.

Figure 47 shows that higher entrepreneurial ecosystem index scores are predominantly concentrated in areas close to city centres. This trend is particularly noticeable in cities like Perth and Adelaide, where the highest scores are almost exclusively found in the metro areas. In contrast, cities such as Sydney and Brisbane show a more diverse distribution, with some high scoring areas located outside the immediate city centres.

These findings highlight the importance of expanding support for entrepreneurial activities beyond metropolitan hubs and fostering growth in regional areas, where such ecosystems are less developed. Of course, enhancing the elements of the regional ecosystem would require significant population growth, investment, and time.

FIGURE 47

Entrepreneurial ecosystem index scores by SA2 areas



Notes: Index is normalised to range between a minimum of zero and a maximum of one.

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

Next, we rank areas based on their entrepreneurial ecosystem index scores at the smaller SA2 area level. Table 5 showcases the top SA2 regions in Australia. The highest ranking areas are all located within Melbourne, specifically Melbourne CBD – North, East Melbourne, and Docklands, which occupy the top three spots. This aligns with the Victorian

government’s innovation strategy and recent investments.

Adelaide’s SA2 area comes in fourth, followed by two additional Melbourne SA2 areas, Southbank – East and South Yarra – West. SA2 areas in Inner Sydney also occupy some spots in that list. East Perth makes the top 20 list, currently positioned at 18th place.

TABLE 5

Top 20 SA2 areas with the highest entrepreneurial ecosystem index scores in Australia

State	SA3	SA2	Entrepreneurial Ecosystem Index
VIC	Melbourne City	Melbourne CBD - North	27.7
VIC	Melbourne City	East Melbourne	27.4
VIC	Melbourne City	Docklands	26.7
SA	Adelaide City	Adelaide	26.6
VIC	Melbourne City	Southbank - East	26.3
VIC	Melbourne City	South Yarra - West	26.1
NSW	Sydney Inner City	Sydney (South) - Haymarket	26.0
SA	Adelaide City	North Adelaide	24.8
VIC	Melbourne City	Carlton	24.6
VIC	Melbourne City	Melbourne CBD - East	24.0
NSW	Sydney Inner City	Darlinghurst	23.2
VIC	Melbourne City	Parkville	23.0
VIC	Melbourne City	Melbourne CBD - West	23.0
NSW	Sydney Inner City	Surry Hills	22.7
NSW	Sydney Inner City	Sydney (North) - Millers Point	22.7
VIC	Melbourne City	North Melbourne	22.5
NSW	Sydney Inner City	Ersleville - Alexandria	21.8
WA	Perth City	East Perth	21.5
VIC	Melbourne City	Southbank (West) - South Wharf	21.3
NSW	Sydney Inner City	Potts Point - Woolloomooloo	20.4

Source: Bankwest Curtin Economics Centre | Authors’ calculations based on various data sources.



East Perth ranks among the top 20 SA2 areas in Australia.



Melbourne's central areas outperform Sydney with a stronger entrepreneurial ecosystem at the SA2 level.

Despite Sydney holding the top rank in the country when comparing SA4 areas, detailed analysis reveals that Melbourne city exhibits a stronger entrepreneurial ecosystem at the SA2 level. This suggests that while Melbourne's central areas are particularly vibrant for entrepreneurship, Sydney has a more evenly distributed ecosystem, with several areas performing at a similar level, allowing it to surpass Melbourne in the overall ranking.

The top 20 SA2 areas are also ranked within each state. In New South Wales, the highest ranking areas are mostly concentrated in Sydney's inner city, as well as in North Sydney, Mosman, and the eastern suburbs (refer to appendix Figure 61 and Table 13).

In Victoria, the top SA2 areas are predominantly located in Melbourne's central city, with additional high ranking areas in Yarra, Port Phillip, and Stonnington making the top 20 (refer to appendix Figure 62 and Table 14).

In Queensland, the top 20 SA2 areas are largely found in Brisbane's inner city and surrounding suburbs, including Kenmore, Brookfield, Moggill, Sherwood, and Indooroopilly (refer to appendix Figure 63 and Table 15).

For South Australia, most of the top 20 SA2 areas are in or near Adelaide's inner city. While the top 7 SA2 areas score highly and fall within the top 10 per cent of the national distribution⁶ of the index, the remainder fall below that threshold (refer to appendix Figure 64 and Table 16).

A more detailed assessment for WA's SA2 areas will now be discussed.

⁶ Refer to appendix Table 10 for detailed information on the top and bottom 5 and 10 per cent values of the entrepreneurial ecosystem indices.

Western Australia's entrepreneurial ecosystem

This report explores Western Australia's entrepreneurial ecosystem by ranking the top 20 SA2 areas based on the index scores (Table 6). The BCEC analysis shows that SA2 areas in inner Perth receive the highest scores, with the top five ranking within the

top 10 per cent of the national distribution. In addition to the city of Perth, areas such as Cottesloe, Claremont, South Perth, Belmont, Victoria Park, Stirling, Melville, and Fremantle also rank among the top 20 SA2 areas in the state. It is also worth noting that each of these areas ranks within the top quarter of the national distribution.

TABLE 6

Top 20 SA2 areas with the highest entrepreneurial ecosystem index scores in WA

SA3	SA2	Entrepreneurial Ecosystem Index
Perth City	East Perth	21.5
Perth City	Perth (North) - Highgate	19.4
Cottesloe - Claremont	Nedlands - Dalkeith - Crawley	17.0
Perth City	Perth (West) - Northbridge	16.7
Perth City	Subiaco - Shenton Park	9.7
Cottesloe - Claremont	Swanbourne - Mount Claremont	7.3
Perth City	Mount Hawthorn - Leederville	6.6
Cottesloe - Claremont	Floreat	6.6
Cottesloe - Claremont	City Beach	6.5
South Perth	Como	6.3
Belmont - Victoria Park	Victoria Park - Lathlain - Burswood	6.3
Cottesloe - Claremont	Cottesloe	6.1
Perth City	Wembley - West Leederville - Glendalough	5.8
Belmont - Victoria Park	East Victoria Park - Carlisle	5.8
Cottesloe - Claremont	Mosman Park - Peppermint Grove	5.7
Stirling	Scarborough	5.6
Melville	Applecross - Ardross	5.5
South Perth	South Perth - Kensington	5.5
Fremantle	Fremantle	5.3
Melville	Booragoon	5.3

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.



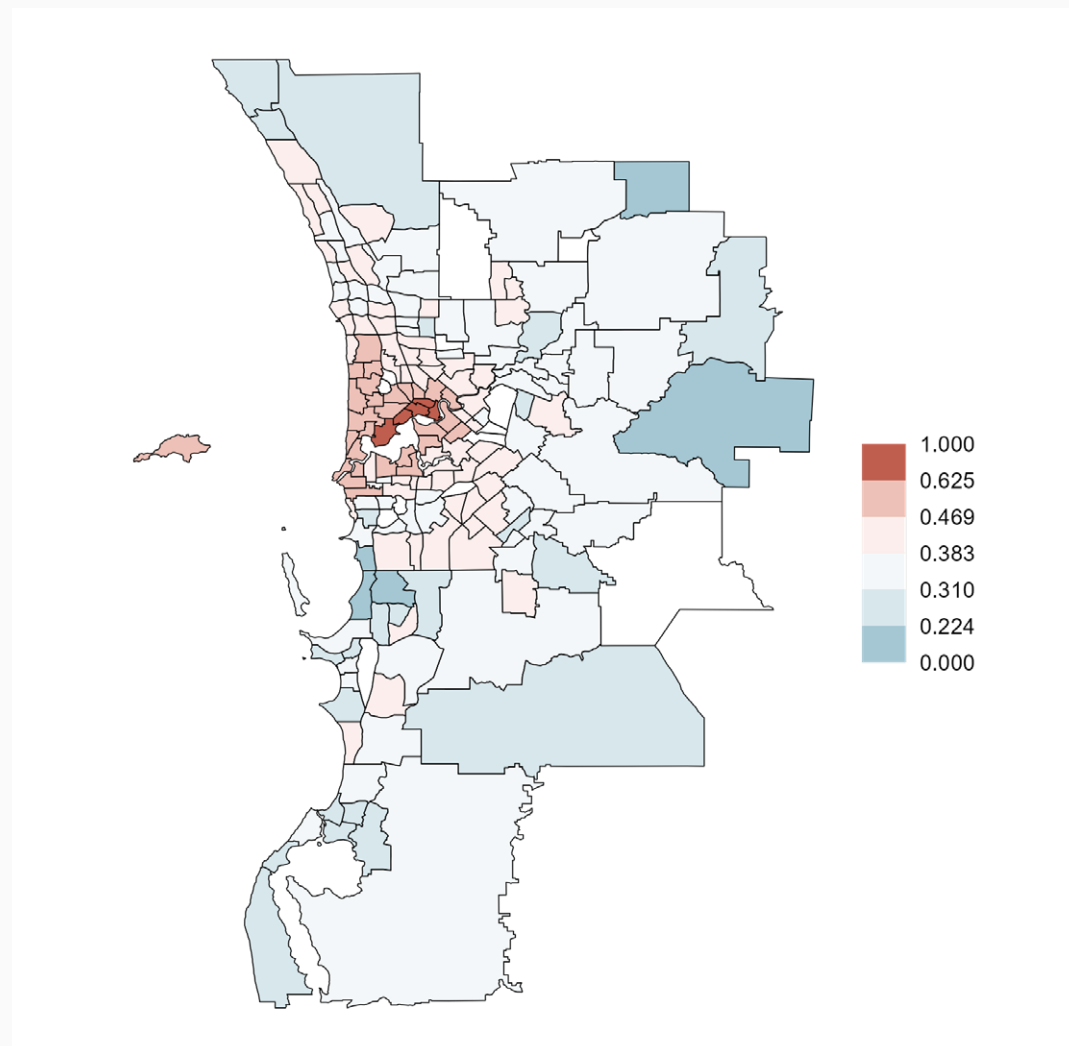
Perth's five highest ranked SA2 regions sit within the top 10% of SA2 regions nationally.

Analysis further reveals that areas closer to Perth's city centre score significantly higher on the entrepreneurial ecosystem index, but these scores drop sharply further from the city (Figure 48). This suggests that regional areas have much weaker startup ecosystems, emphasising the need to expand entrepreneurial support beyond the metropolitan centre to foster growth in less developed areas.

It is also worth noting that certain areas where universities or innovation hubs are located seem to have a strong entrepreneurial ecosystem. While we do not analyse the cause of this in detail, it is likely that a key contributor is positive knowledge spillover effects stemming from universities and innovation hubs to local businesses.

FIGURE 48

Entrepreneurial ecosystem index scores by SA2 areas, Greater Perth



Notes: Index is normalised to range between a minimum of zero and a maximum of one.

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

Table 7 presents the top 20 SA2 areas in Western Australia, excluding inner Perth, to highlight regional areas that perform well on the entrepreneurial ecosystem index.

When inner Perth is removed from the sample, Bayswater, Bassendean, and Canning emerge as top-performing areas within the state, securing places among the top 20.⁷

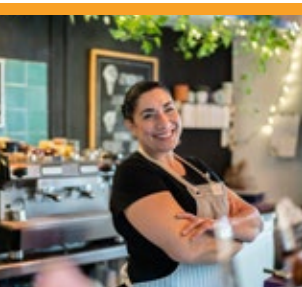
TABLE 7

Top 20 SA2 areas with the highest entrepreneurial ecosystem index scores in WA, excluding inner Perth

SA3	SA2	Entrepreneurial Ecosystem Index
South Perth	Como	6.3
Belmont - Victoria Park	Victoria Park - Lathlain - Burswood	6.3
Belmont - Victoria Park	East Victoria Park - Carlisle	5.8
Stirling	Scarborough	5.6
Melville	Applecross - Ardross	5.5
South Perth	South Perth - Kensington	5.5
Fremantle	Fremantle	5.3
Melville	Booragoon	5.3
Fremantle	Fremantle - South	5.1
Stirling	Karrinyup - Gwelup - Carine	4.9
Stirling	Wembley Downs - Churchlands - Woodlands	4.5
Stirling	Innaloo - Doubleview	4.4
Fremantle	East Fremantle	4.0
Bayswater - Bassendean	Maylands	3.8
Melville	Melville	3.7
Bayswater - Bassendean	Bayswater - Embleton - Bedford	3.4
Canning	Bentley - Wilson - St James	3.3
Canning	Willetton	3.3
South Perth	Manning - Waterford	3.3
Melville	Bicton - Palmyra	3.2

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

⁷ See appendix Table 17 for a list of the top 50 SA2s in WA. These are rankings are derived out of 250 SA2 areas with non-missing information on the entrepreneurial ecosystem index in WA.



350 additional new startups in WA could be created if WA's entrepreneurial ecosystem index aligned with the national average.

SCENARIO ANALYSIS

This report has provided a detailed assessment of the entrepreneurial ecosystem in Australia, with nuanced findings at the SA2 level. While Western Australia and Greater Perth still trail behind the eastern states overall, inner Perth ranks 3rd nationally, performing on par with the inner city areas of the eastern states in most aspects. However, inner Perth still lags behind in key elements such as new knowledge, talent, and leadership (see Figure 45).

The BCEC conducted a scenario analysis to estimate how improvements in those elements of the ecosystem where Perth falls below the national average, specifically in new knowledge, talent, and leadership, would impact the number of startups in Western Australia.

The BCEC modelling reveals that a 1 per cent increase in the proportion of individuals with leadership skills, such as managers, a 1.2 per cent rise in the number of tertiary educated people, and a 15.7 per cent

increase in expenditure in R&D could boost Perth's entrepreneurial ecosystem to equal average scores across all inner cities in Australia.

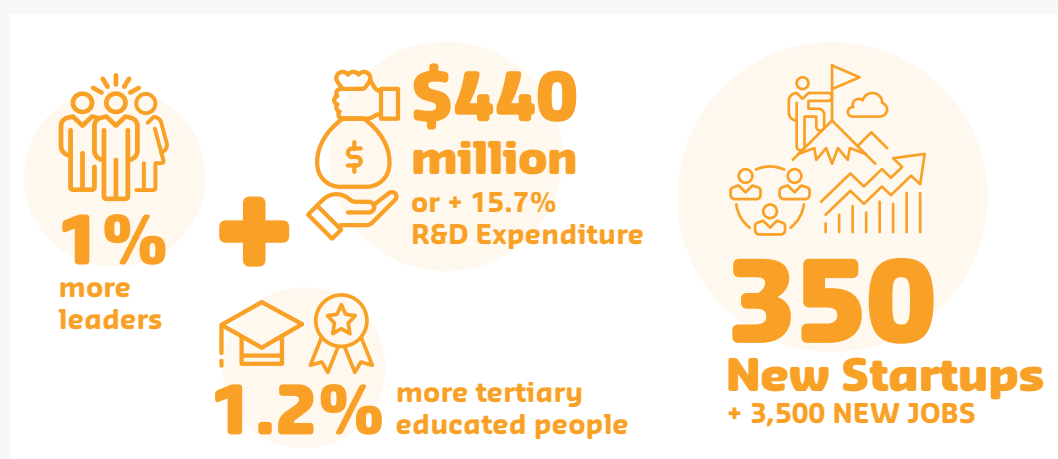
These numbers translate to an additional 8,000 individuals pursuing tertiary qualification⁸, 1,600 additional individuals with leadership qualities and a \$440 million increase in R&D expenditure. While the latter is a big number, it is worth noting that in VIC, R&D expenditure by businesses alone increased by 23 per cent between 2017-18 and 2021-22.

Strengthening Perth's entrepreneurial ecosystem is projected to significantly boost startup growth, with an estimated increase of 350 new startups.⁹

As of 2024, 1,020 startups located in Perth employed around 9,652 workers (see Figure 3 for reference). Analysis suggests that these additional startups would further expand employment opportunities resulting in around 3,500 new jobs.

FIGURE 49

Scenario analysis: Shifting the entrepreneurial ecosystem dial



Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

⁸ This is in line with the government's target of increasing the share of prime age individuals holding a bachelor degree or above to 55 per cent by 2050 (see Australian Universities Accord, 2024).

⁹ Refer to appendix Table 18 for the modelling on the relationship between entrepreneurial ecosystem index and number of startups.



DRIVERS OF SUCCESS

INTRODUCTION

This chapter investigates the critical success factors for startups in Australia and explores any gender disparities present. While there is no universally agreed definition for startup success, the most common and widely adopted measure in the literature is an exit through a successful acquisition and merger or initial public offering (IPO) (see for example Arora *et al.*, 2021; Howell, 2017).

A successful acquisition or IPO indicates that a startup company is well-founded in the market and is likely to survive and generate returns to investors and founders. For this reason, a startup's exit via IPO or acquisition is considered an indicator of success.

Understanding the critical factors for startup success is crucial for entrepreneurs, investors and policymakers responsible

for developing strategies for a thriving and high growth potential system of startups. To uncover the potential success factors for startups, this study utilises an econometric model for predicting startup success where the outcome variable is captured as a successful exit through acquisitions or IPO separately. The startup data for Australian states used in this modelling exercise is obtained from Crunchbase for the period from 2006 to 2023.

After cleaning the data, the final sample for the study constitutes over 2,900 observations nationally. About 30 per cent of the sample companies exited via acquisitions and 21 per cent via IPO. Some 50 per cent of startups in the sample closed and are deemed here as unsuccessful.

WHAT DRIVES AND IMPEDES SUCCESS?

Exit through acquisition

Figure 50 presents the critical factors influencing the probability of successful exit through acquisition. The model includes a range of variables including various fundraising activities, the number of funding rounds, the access to talent and the startup founders previous experience, as well as the age of the startup business from foundation to exit.

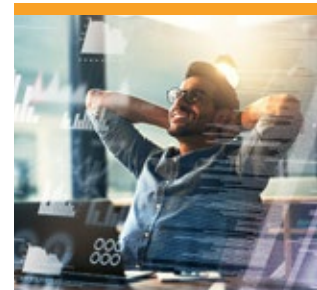
All the factors included in the model have a positive impact on the likelihood of startup success.

Startups that succeed in obtaining multiple funding rounds have a significantly higher chance of successful acquisition compared to the baseline single funding round (Figure 50). The significant, positive and large magnitude of the estimate on the effect of the number of funding rounds underscores the importance of sustainable rounds of funding. In fact, moving from one successful funding round to four or more successful funding rounds increases the chances of success by over 12 percentage points.

Startups where founders have previous entrepreneurial experience also have a higher chance of success compared to startups where the founder did not have previous entrepreneurial experience, with the chance of success increasing 6 percentage points to 36 per cent.

The age of the startup business predicts a positive probability of successful acquisition too. An additional year of the age of a startup is associated with an increase in the chances of success by 8 percentage points. Access to talent in the local area of the startup also improves the probability of startup acquisition (by 4ppts).

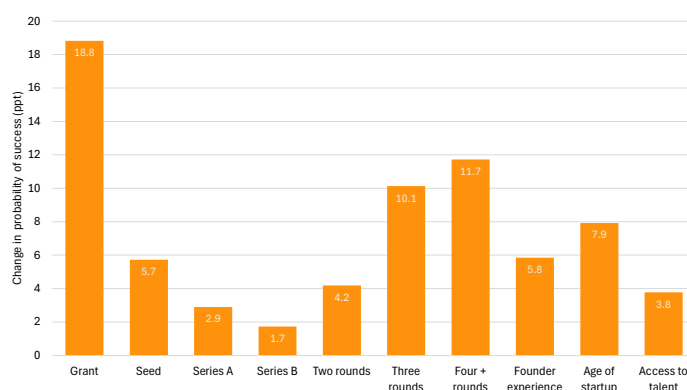
Grants also increase the probability of successful acquisition, but to a lesser extent. The results indicated that an \$100,000 increase in grants obtained increases the probability of acquisition by 1.9 percentage points (ppts) from 30 per cent to almost 32 per cent.



Startups that succeed in obtaining multiple funding rounds have a significantly higher chance of successful acquisition.

FIGURE 50

Changes in the probability of successful exit through acquisitions



Notes: Grant, seed, Series A and Series B fundings are in \$millions of AUD per year of startup age. Age of startup is in years, with an additional year increasing the probability of success by 8ppts. Funding rounds show the stages of investment that the startup companies go through from early stage to maturity. Obtaining one funding round is used as a reference category for the number of funding rounds. The estimates are marginal effects following a multinomial logit model estimation.

Source: Bankwest Curtin Economics Centre | Authors' estimates from Crunchbase data.



The majority of acquired Australian startups are bought by USA based organisations.

The choice of exit strategies has important implications from the perspective of policy. While exits via acquisition are commonly interpreted as an indicator of success, some commentators have raised concern that incumbent large firms acquire emerging startups to reduce competition (e.g., Cunningham *et al.*, 2021).

Many startups migrate to locations where the ecosystem is well developed and concentrated. This includes moving to where there is greater market demand, greater availability of talent to grow the business and a larger scale of complementary intermediate services to support growth.

Table 8 shows that of those startups acquired, about 20 per cent that were founded in WA are acquired by other WA

companies. The remaining 80 per cent were acquired by companies outside of the state. Almost 15 per cent of acquired WA startups have acquirers based in NSW, 16.2 per cent by companies based in the USA and 13.6 per cent acquired by companies based in the UK.

Compared to VIC (14.6%) and QLD (7.4%), WA has a larger share of acquired startups that are acquired by WA based companies. About 30 per cent of acquired startups in NSW have an acquirer within the state itself, the largest reported across the states.

Across all states, the USA has acquired largest shares of startups from each Australian state (ranging from 16.2% for WA to 25.5% for NSW).

TABLE 8

Distributions of acquired startups by acquirer and acquiree locations (%)

Acquirer's location	Startup's location of origin			
	NSW	VIC	QLD	WA
NSW	29.9	19.9	20.5	14.6
VIC	8.5	14.6	6.4	6.5
QLD	2.4	2.5	7.4	3.6
WA	2.3	1.4	3.0	19.5
USA	25.5	28.2	28.2	16.2
UK	11.0	10.5	9.9	13.6
CAN	2.6	3.2	5.2	5.8
Others	17.8	19.7	19.5	20.1

Source: Bankwest Curtin Economics Centre | Authors' estimates from Crunchbase data.

Exit through IPO

Figure 51 presents the results for exits through IPO. Grants and success in multiple funding rounds are crucial to a successful IPO exit.

A key difference from the results for the acquisition exit outcome is that access to seed funding tends to reduce the chances of exit via IPO. While sample size may be a factor at play, this may also imply an intentional strategy from the outset

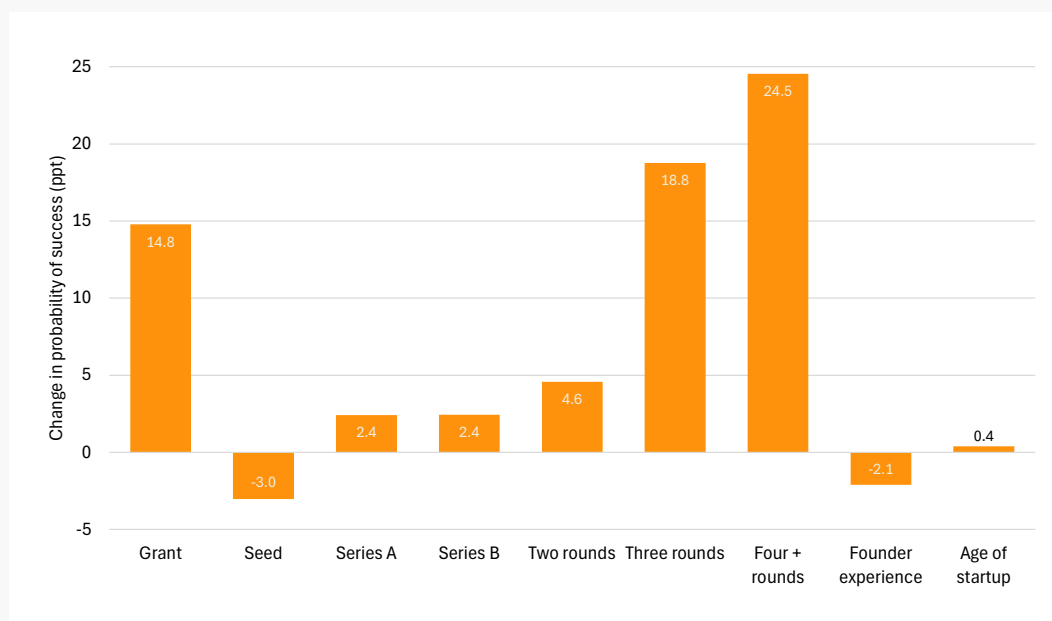
or a change in preference to exit through acquisitions.

But, overall, early funding does matter. Startups that secure four or more funding rounds have a 25 percentage points higher chance of IPO exit compared to those with one round of funding.

And a \$100,000 increase in grants improves the probability of IPO by 1.5 percentage points from 21 per cent to 32.5 per cent.

FIGURE 51

Changes in the probability of successful exit through IPO



Notes: Grant, seed, Series A and Series B fundings are in \$millions of AUD per year of startup age. Age of startup is in years, with an additional year increasing the probability of success by 8ppts. Funding rounds show the stages of investment that the startup companies go through from early stage to maturity. Obtaining one funding round is used as a reference category for the number of funding rounds. The estimates are marginal effects following a multinomial logit model estimation.

Source: Bankwest Curtin Economics Centre | Authors' estimates from Crunchbase data.



It is well documented that female founded startups are underrepresented in the startup ecosystem.

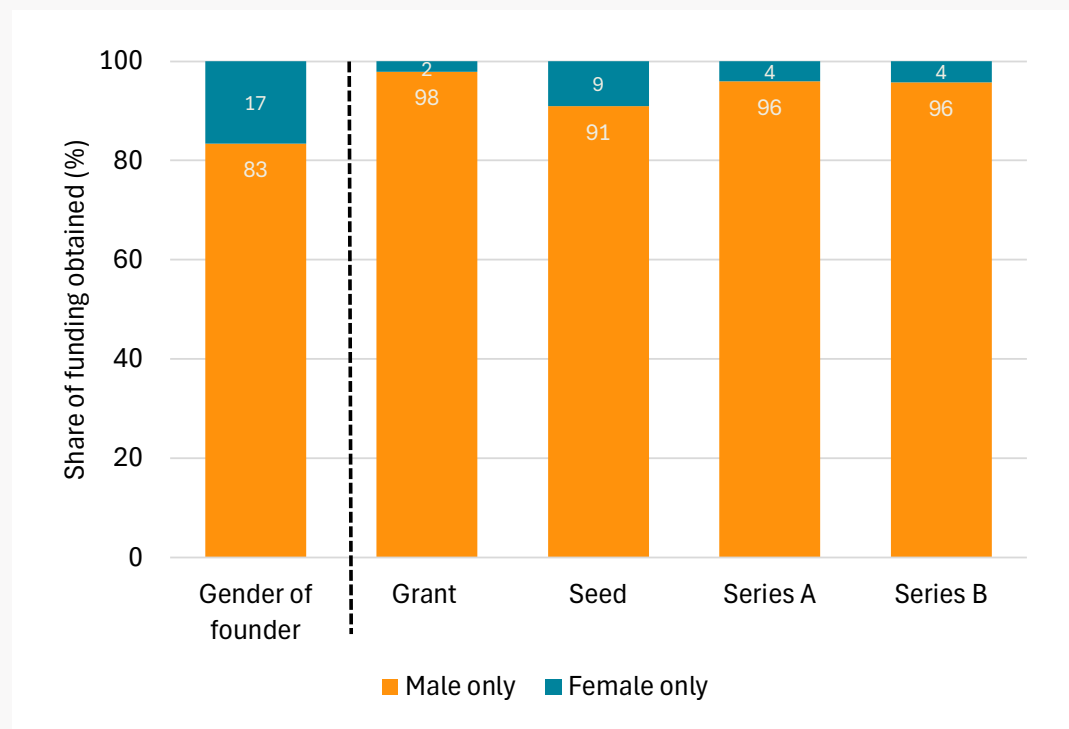
GENDER DISPARITY IN STARTUP SUCCESS: BARRIERS AND MITIGATION STRATEGIES

It is well documented that female founded startups are underrepresented in the startup ecosystem, both in Australia and internationally (Guzman and Kacperczyk, 2019; Kanze *et al.*, 2018). Based on the Crunchbase sample used in the modelling here, 83 per cent of Australian startups are founded by males while 17 per cent are founded by women as displayed in the first column in Figure 52.

The gender disparity becomes even more pronounced when one looks at the proportion of funding obtained. Male founders obtained more than 90 per cent of total funding in all funding activities, with this share as high as 98 per cent for grants and 96 per cent for Series A and Series B funding.

FIGURE 52

Differences in startup funding activities by gender of the founder, Australia, 2006-2023



Source: Bankwest Curtin Economics Centre | Authors' estimates from Crunchbase data.

The industry distribution by gender (Figure 53) shows that female founders are underrepresented across industry categories except for the clothing and apparel industry (58%).

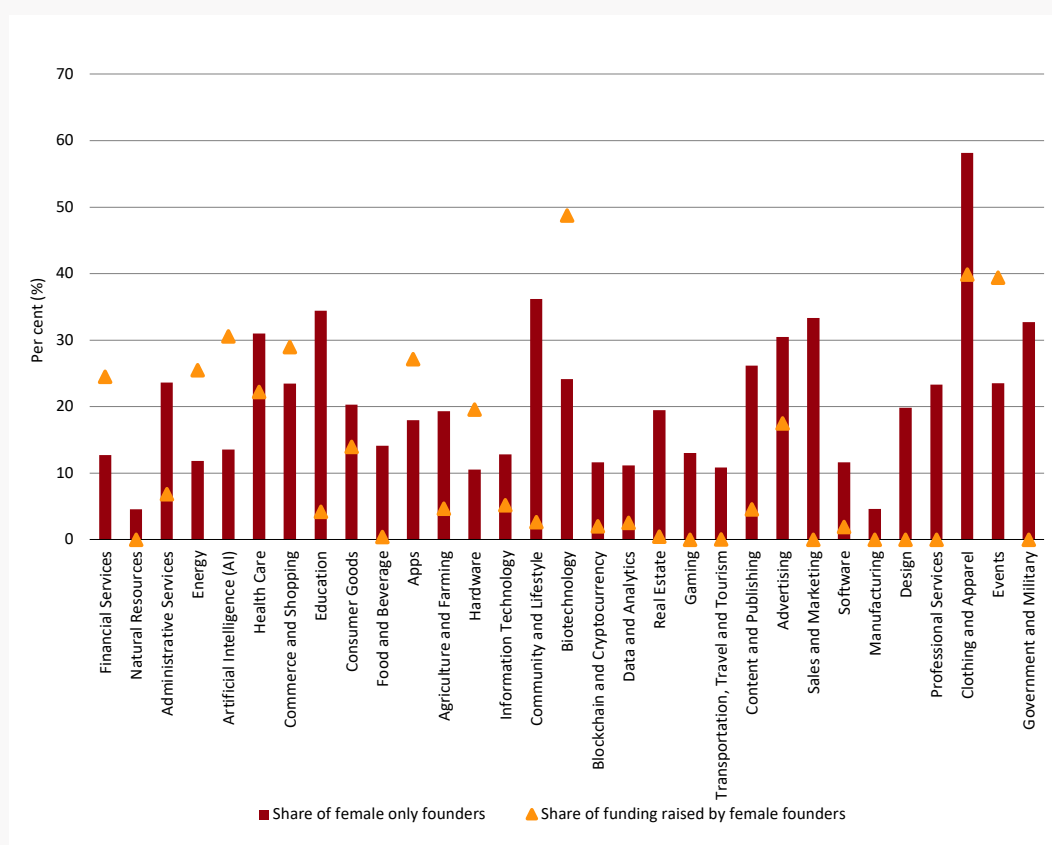
For most of the industry categories, the share of funding raised by female founders is lower than their representation in share terms. For example, for startups in the healthcare sector, women make up 31 per

cent of founders but obtain only 22 per cent of funding. This is more pronounced in some sectors such as community and lifestyle, and software.

In some categories, such as biotechnology, AI, events and financial services, female founders raised a greater share of funding relative to their representation in those sectors.

FIGURE 53

Share of female founders and share of funding raised by broad industry category (%), Australia



Notes: The shares are calculated based on data for operating startup companies founded from 2013.

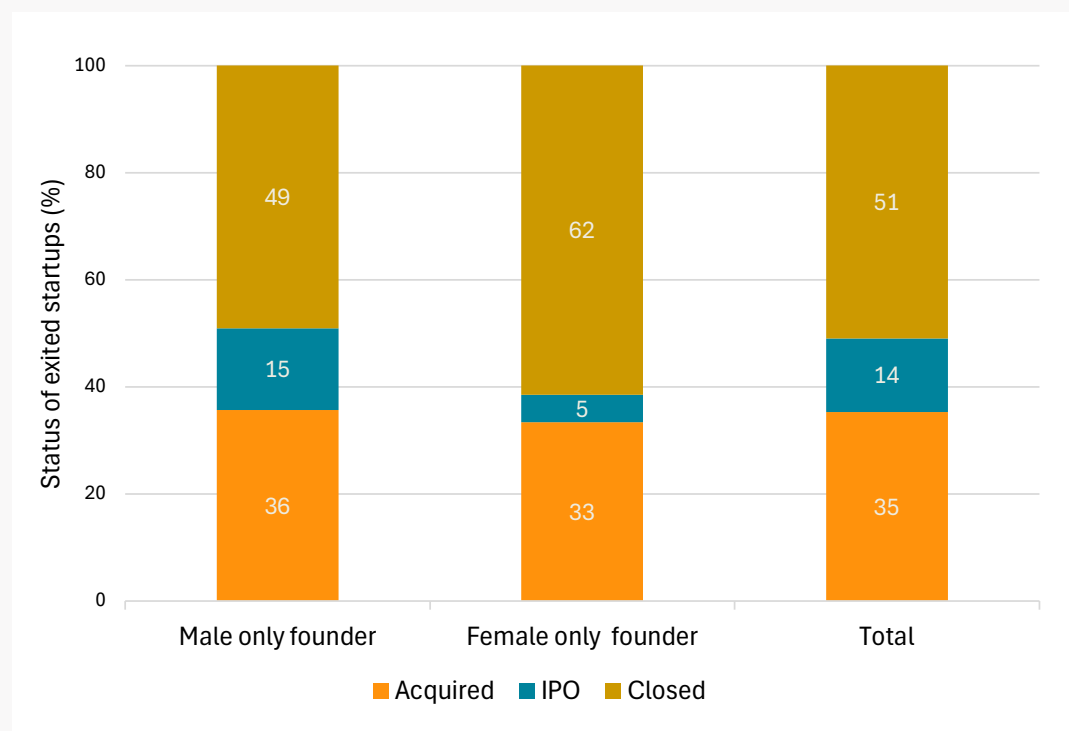
Source: Bankwest Curtin Economics Centre | Authors' estimates from Crunchbase data.

How does this translate into the share of companies that transition to IPO or being acquired? The share of male founded companies that were acquired (36%) is only slightly higher than that for female founded companies (33%) between 2006 and 2023.

However, for IPO outcome, this share is three times higher for male founded companies (15%) compared to female founded companies (5%) (Figure 54).

FIGURE 54

Differences in exit outcomes by gender of founder, Australia, 2006-2023



Source: Bankwest Curtin Economics Centre | Authors' estimates from Crunchbase data.

DECOMPOSING THE GENDER GAP

Building on the modelling analysis reported earlier on drivers of success, this study examines whether the observed gender gap in startup success (defined as transition to IPO or acquisition) can be explained by observable characteristics, such as obtaining grants, fundings, entrepreneur experience and age of startup. The overall decomposition shows that startups with male founders tend to have 10ppts higher chance of successful exit via acquisition or IPO compared to that of female founded startups.

Accounting for industry characteristics, a decomposition analysis shows that 55 per cent the gender gap in the success rate (via IPO or acquisition) of startups can be explained by startup characteristics.

The differences in access to grants contribute to 10 per cent of the observed gender disparity in startup success through IPO or acquisition. Put differently, increasing female founders' access to grants to the level of male founders bridges the gender gap by 10 per cent.

Seed, Series A and Series B funding together account for a further 10 per cent of the gender gap.

And being successful in obtaining multiple funding rounds has a sizeable effect. Compared to receiving only one funding round, successfully obtaining four or more funding rounds closes the gender gap by 20 per cent.

Initiatives to bridge the gender gap in entrepreneurship and access to grants are occurring, with various announcements from both state and federal governments in recent years. Supports to increase the skillsets of female entrepreneurs and the information required in applying for grants are taking place.

The private sector too is taking steps. There are a growing number of female venture capital fund managers which is likely to help shift the dial.

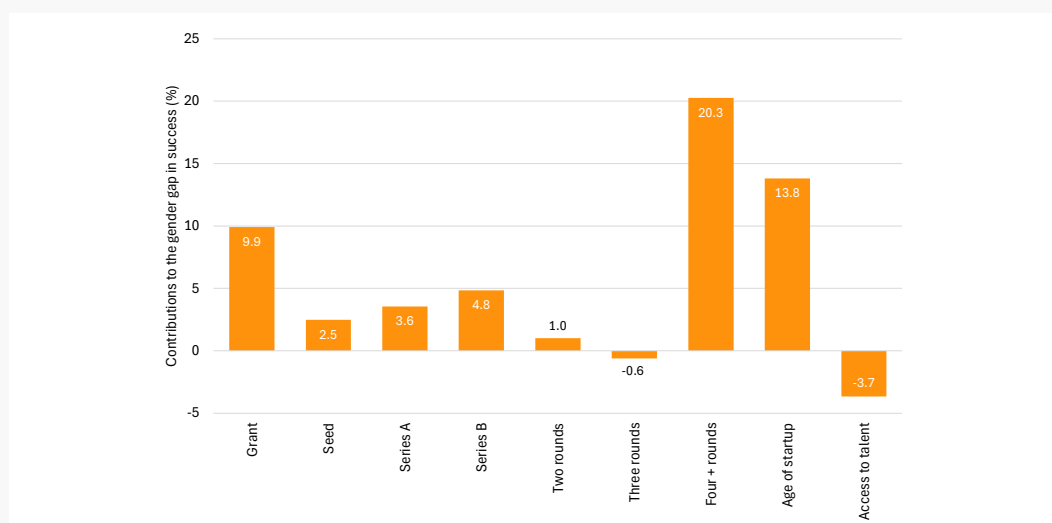
But more is required. And existing programs and initiatives need to be consistent over time and of a scale that makes a real impact. It will take time before the fruits of current initiatives take full effect from an IPO or acquisition perspective, but it is important to track these outcomes in the years ahead to ensure progress is being made.



55% of the gender gap in the success rate (via IPO or acquisition) of startups can be explained by startup characteristics.

FIGURE 55

Driver of gender differences in startup success



Notes: The estimate for founder experience is not reported because it is close to zero.

Source: Bankwest Curtin Economics Centre | Authors' estimates from Crunchbase data.

"MORE WORK
IS REQUIRED
TO ADDRESS
THE **UNDER
REPRESENTATION
OF FEMALES** IN THE
ENTREPRENEURIAL
ECOSYSTEM."



SUMMARY AND POLICY DISCUSSION

SUMMARY AND POLICY DISCUSSION

This report adds to a growing body of work and interest on the innovation ecosystem in WA and the contribution and understanding of the startup landscape and entrepreneurial ecosystem in the Australian and WA economies.

The startup sector has relevance to numerous Western Australian government strategies that speak to innovation, industry diversification, STEM skills, regional economic development and population growth.

This report seeks to add to existing analysis to better understand the startup and innovation ecosystem in WA, towards informing policies that help to support entrepreneurship, thus curating an innovation ecosystem within which startups can thrive.

Existing strengths, but a need to diversify

This research report highlights the geographical location of startups in WA and the sectoral concentration of startups relative to other states and territories across Australia.

The density of startups in WA with primary business activities related to natural resources, energy and manufacturing is high relative to the national average. These startups are emerging in sectors related to WA's existing industry strengths.

Beyond the five leading sectors for the state, the relative density of sectors across WA quickly drops to only 80 per cent of the national average. WA is missing out on growth opportunities in rapidly evolving sectors, particularly in artificial intelligence, data analytics, IT, and biotechnology.

Foundations for growth: An interconnected and interdependent ecosystem

Startups do not emerge in a vacuum. They evolve within a broader ecosystem. To better understand this ecosystem the BCEC has developed an entrepreneurial ecosystem index to measure ten key elements driving startup growth and innovation at a small geographic area level (SA2) across Australia.

Greater Perth ranks fifth in Australia's entrepreneurial ecosystem index, following Sydney, Melbourne, Brisbane, and Adelaide. But at the smaller geographical level, inner Perth performs more competitively, ranking third nationally, with six out of ten elements on par with or surpassing those of inner Sydney and Melbourne. However, inner Perth still falls short in new knowledge, talent, and leadership.

Scenario analysis reveals that if inner Perth's entrepreneurial ecosystem index matched the national average, it could lead to the creation of an additional 350 startups in Western Australia, representing a 35 per cent increase on current levels.

One set of factors required to achieve this index equivalence include 8,000 more individuals obtaining tertiary qualifications, 1,600 individuals with business and managerial skills, and a \$440 million increase in R&D expenditure over time.

Skills and talent

Human capital is crucial for fostering entrepreneurship and the creation of new businesses. WA falls behind other states in several human capital metrics related to entrepreneurship drawing further attention to the need to improve education levels and STEM skills towards supporting

innovation intensive sectors. For instance, targeted programs to increase tertiary and vocational education in high-growth fields like technology and business management could address talent shortages (Australian Universities Accord, 2024).

Further emphasis on business-university collaborations and supporting ongoing training initiatives in emerging sectors would further support a diversified, highly skilled workforce prepared to drive future innovation. More programs like the recent initiative of resource technology and minerals Trailblazer program in other sectors would be crucial to foster the development of the startup ecosystem. Further supports for incubator and accelerator programs are required to develop entrepreneurial skill sets based on state, national and international best practices.

Expenditure on research and development

Australia's R&D expenditure sits at 1.8 per cent of GDP behind the OECD average of 2.6 per cent, with Israel (5.6%) and the USA (3.5%) setting much higher benchmarks.

This report highlights the need for Australia to align its R&D spending closer to OECD averages if the nation wants to compete globally. This can be achieved by introducing tax incentives or grants for both private sector and academic research, targeting emerging areas such as AI, biotech, and green technology. While there is already progress in this area¹⁰, further targeted approaches should be considered.

In WA, R&D investment should expand beyond mining, with further incentives directed to less represented areas such

as health, digital tech, and renewable energy to help diversify and strengthen the economy.

Programs such as the Future Health Research and Innovation Fund are key, as well as funding such as the Innovation Booster Grant (IBG) that support the commercialisation of research are important to position the state as a leader in emerging health and technology sectors as well as those sectors related to decarbonisation, an area where WA has huge growth potential (Buckland *et al.*, 2023).

Access to funding

Funding plays an essential role in the startup ecosystem, fuelling both the creation of new businesses and the growth of existing ones. Work to develop the Australian and WA venture capital sector is occurring with the emergence of new venture capital funds in recent years.

Government grants and supports play a key role too in both building the ecosystem and supporting startups. WA government programs such as the New Industries Fund (\$25m), and the Investment Attraction Fund (\$148.4m) are important for supporting new startups as they transition through the business lifecycle.

Such supports have longer term benefits for startups too. The BCEC modelling shows that an additional \$100,000 grant during the startup stage increases the likelihood of a successful exit through acquisition by 1.9 percentage points and the likelihood of an IPO exit by 1.5 percentage points. And being successful in obtaining multiple funding rounds (such as Seed, Series A, Series B and other VC funding) also

¹⁰ See for example, <https://business.gov.au/grants-and-programs/research-and-development-tax-incentive> and <https://www.wa.gov.au/organisation/department-of-jobs-tourism-science-and-innovation/grants-assistance-and-programs-register-wa-industry>.

matters, as does the founders' experience and their ability to access talent.

Certainty around the provision of such grants sends an important signal for the importance of the ecosystem. And the scale of such grants is important too to sufficiently impact the chance of success.

Bridging gender disparity

Female founded startups are underrepresented in the startup ecosystem. This report shows a disparity in terms of entry, access to funding and successful exit at the end of the lifecycle of the startup enterprise. But modelling here also shows that the gap can be closed.

Indeed action is taking place. The WA Innovation Strategy identified diversity and inclusion as one of the seven target priority areas. Initiatives such as the X-Tend WA grant are designed to equip Western Australian women, First Nations' entrepreneurs and people in the regions with the knowledge, skills, and confidence to develop their entrepreneurial talents.

The private sector is taking steps too, with for example, a growing number of female venture capital fund managers.

It will take time before the fruits of such initiatives take full effect. Programs and initiatives need to be consistent over time and of a scale that can make a real impact in bridging the gap.

Brand WA - raise international awareness / build networks internationally

To support the growth of WA's entrepreneurial ecosystem, attracting investment and skilled workers is essential. To do so, the state needs to strengthen international relationships and global networks.

WA is already taking steps. For example, a recent WA delegation participated in the Vietnam Innovation Summit 2024, showcasing the state's commitment to fostering global connections and attracting foreign investment. These efforts are essential to position WA as a competitive and attractive hub for innovation and talent, and strengthen supply chains.

Data development strategy

To support effective measurement of startup activity and innovation ecosystems, it is important to establish a consistent, agreed-upon definition of what is being measured. A unified approach to tracking outcomes ensures that economists and policymakers are aligned in assessing ecosystem performance.

Continuing to monitor elements of the ecosystem over time can help identify emerging trends and the areas needing support. This way, policymakers can provide timely assistance to underperforming areas and evaluate the impact of specific policy and program interventions. Achieving this goal will require dedicated resources.

Startups and the ecosystem in which they operate are critical elements to WA's diversification agenda. There are some positive signs and activities occurring in the WA entrepreneurial ecosystem. But more work is required to curate an ecosystem within which startups can thrive.

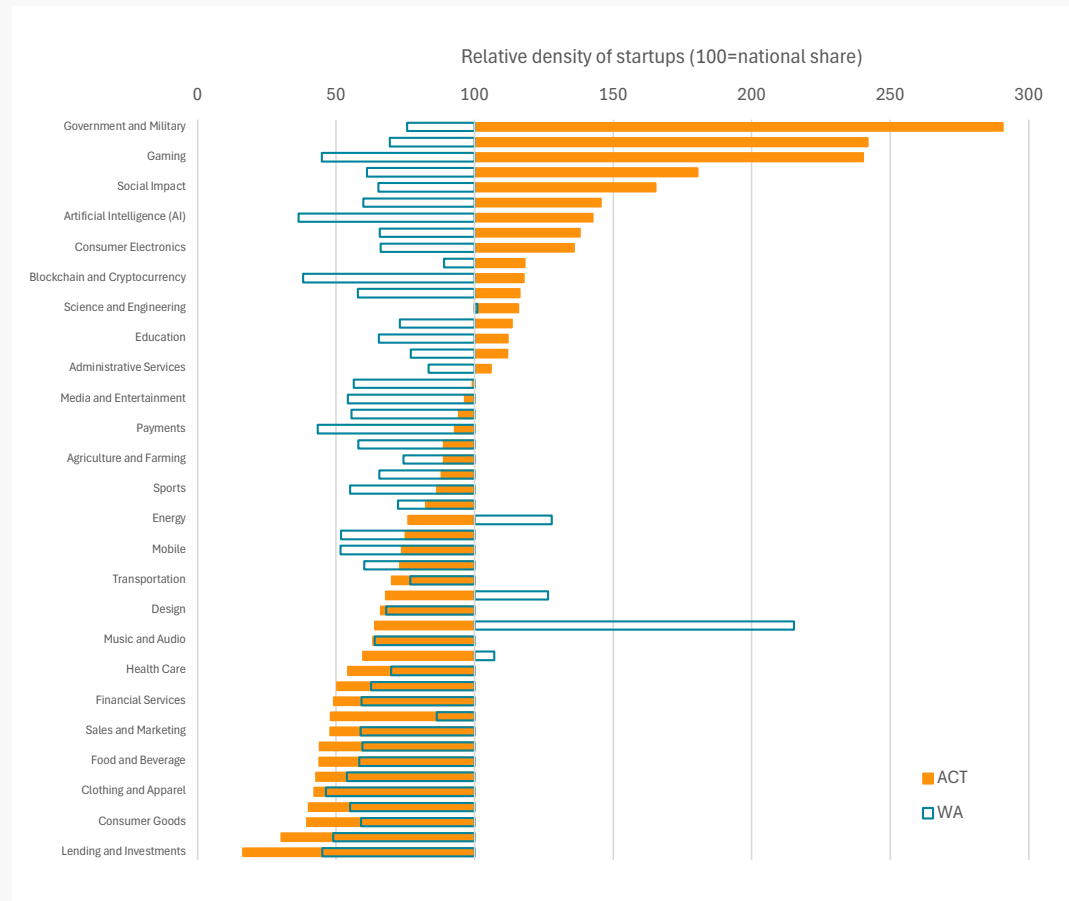


APPENDIX

APPENDIX A: DENSITY OF STARTUPS

FIGURE 56

Relative density of startups per 100,000 persons by sector/activity, ACT and WA

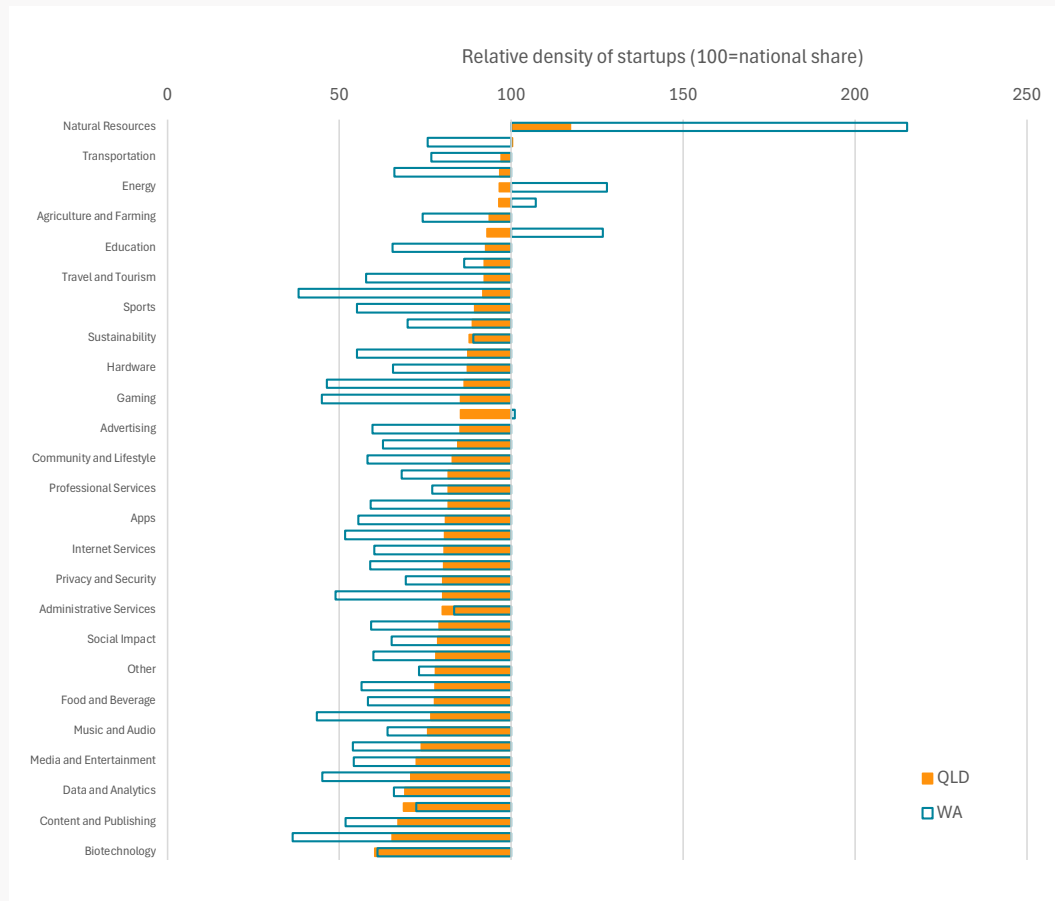


Note: A value of 100 equates to the Australian national average density of startups per 100,000 of the population. Sorted based on ACT ranking.

Source: Bankwest Curtin Economics Centre | Authors' calculations from Crunchbase and ABS population data.

FIGURE 57

Relative density of startups per 100,000 persons by sector/activity, QLD and WA

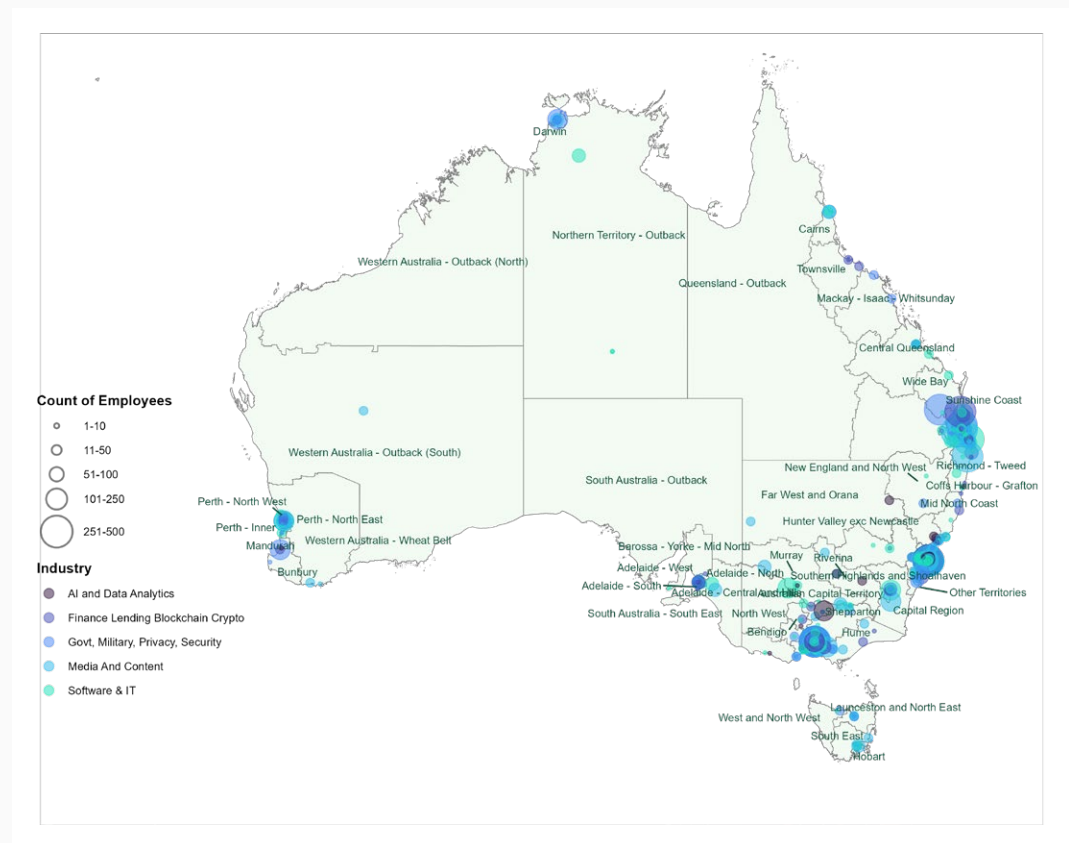


Note: A value of 100 equates to the Australian national average density of startups per 100,000 of the population. Sorted based on QLD ranking.

Source: Bankwest Curtin Economics Centre | Authors' calculations from Crunchbase and ABS population data.

FIGURE 58

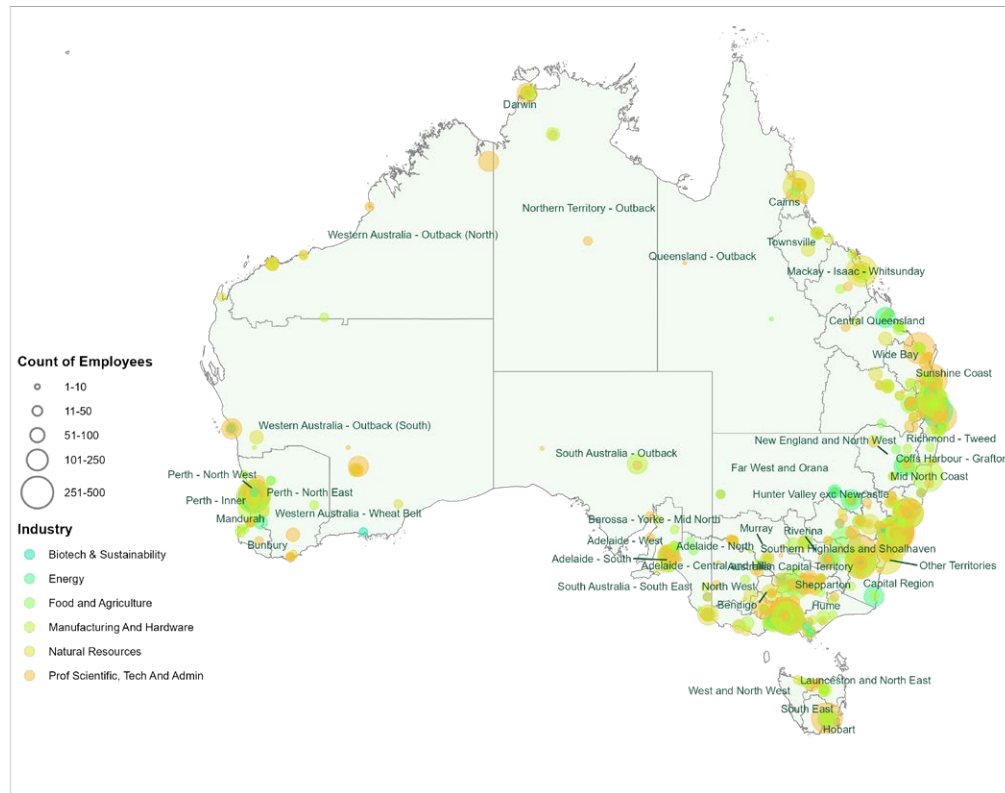
Location of startups in Australia related to government, AI and data analytics, finance, media and content and software and IT



Source: Bankwest Curtin Economics Centre | Authors' calculations from Crunchbase and ABS population data.

FIGURE 59

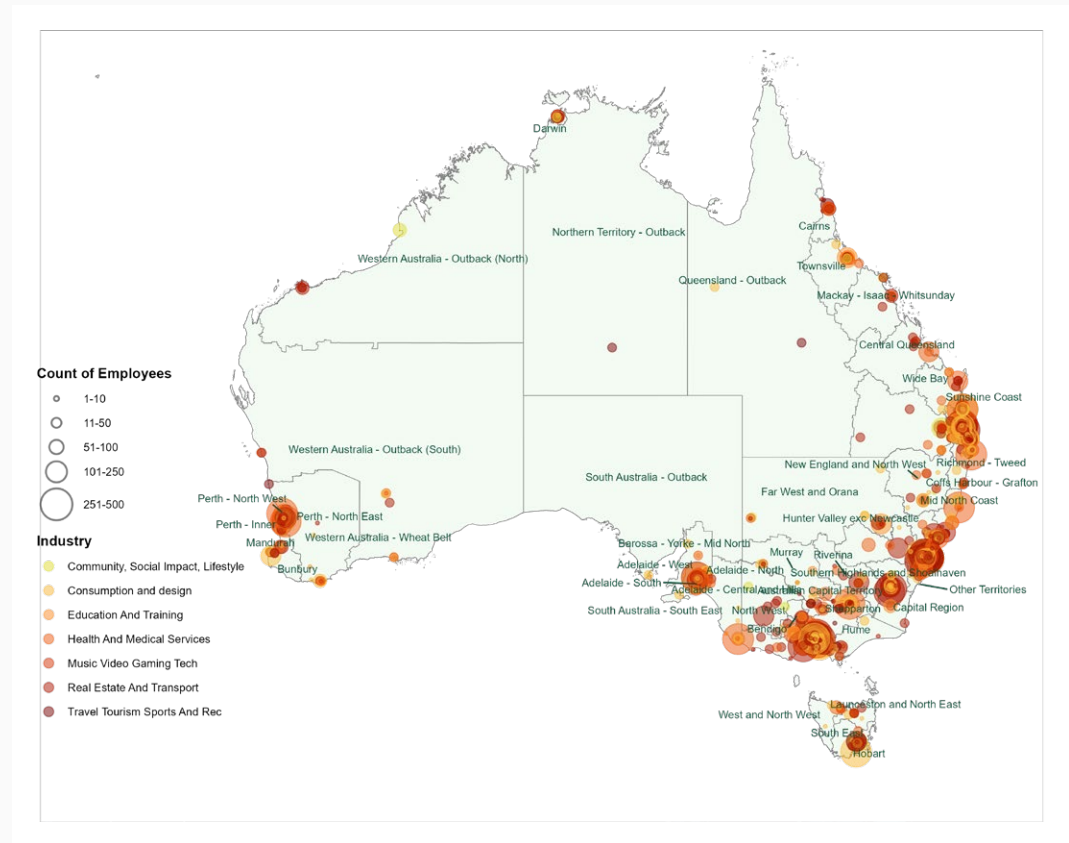
Location of startups in Australia related to manufacturing, resources, energy and professional and scientific services



Source: Bankwest Curtin Economics Centre | Authors' calculations from Crunchbase and ABS population data.

FIGURE 60

Location of startups in Australia related to consumption services



Source: Bankwest Curtin Economics Centre | Authors' calculations from Crunchbase and ABS population data.

APPENDIX B: ENTREPRENEURIAL ECOSYSTEM INDEX

Following previous studies, we have identified ten key indicators measuring entrepreneurial ecosystem quality (Leendertse *et al.*, 2022). These indicators comprise the ten elements we use to construct our composite *entrepreneurial ecosystem index*.

First, *formal institutions* provide the foundational conditions for economic and entrepreneurial action. This study utilises two measures of formal institutions, one specific to entrepreneurship and a generic one. To measure the generic quality of formal institutions, a range of indices developed by the Regional Australia Institute (RAI) were utilised (Regional Australia Institute, 2011a). Specifically, this research used the overall institutional quality index, transparency index and local government assistance index. These metrics reflect the quality of formal institutions that establish the legal and administrative framework governing businesses. In addition, the number of university campuses, hospitals, and police stations per capita were used as indirect measures of institutional quality in a specific area (AURIN, 2019; National Health Performance Authority, 2016; Geoscience Australia, 2023). Additionally, this report employed an entrepreneurship specific measure of institutional quality, the ease of doing business index which captures a variety of metrics around business regulations (Regional Australia Institute, 2011b). By integrating this entrepreneurship specific measure with the broader indicators of formal institutional quality, this study created a metric that reflects both general and entrepreneurship focused institutions.

Second, *entrepreneurship culture* is a proxy for informal institutions reflecting societal norms and attitudes toward new firm creation and innovation. Regions with high

levels of entrepreneurship culture create an environment where entrepreneurs feel encouraged and supported. To measure this element, this research follows the previous literature (Stam and Van de Ven, 2021) and uses information on new business entries as a share of total businesses over the past five years from the Australian Bureau of Statistics (ABS) (ABS, 2011-23).

Third, *networks* are another essential element since they facilitate the flow of information and resources like labour, capital, and knowledge. Following prior research (Leendertse *et al.*, 2022), this report measures networks by calculating the proportion of small and medium enterprises (SMEs) relative to total businesses, as well as the proportion of SME entries relative to total business entries in a given area. SMEs are defined as businesses with fewer than 20 employees. This data is sourced from the ABS (ABS, 2011-23).

Fourth, *physical infrastructure* is another significant element contributing to venture creation. A well-developed infrastructure connects markets, reduces transaction costs, and improves access to customers and suppliers, making it easier for businesses to operate and grow. This study assesses physical infrastructure using the infrastructure and essential services index developed by RAI, which evaluates the quality of transportation infrastructure, including access to roads, railways, airports, and ports (Regional Australia Institute, 2011c). This report also used data from the ABS on the percentage of people with home internet access as a proxy for infrastructure quality (ABS, 2011-23).

Fifth, access to *finance* is essential for fostering firm creation. Without sufficient capital, entrepreneurs are less likely to invest in new ventures, which constrains

innovation. To measure access to finance, this study used access to local finance index developed by RAI (Regional Australia Institute, 2011b). The total funding received by firms relative to the total number of businesses in a specific area were also utilised (Crunchbase, 2024).

Sixth, *leadership* is crucial in maintaining a healthy entrepreneurial ecosystem. Leaders can help shape the local startup landscape and inspire others to follow. This study measures leadership by calculating the total number of managers as a proportion of the employed population, along with the percentage of managers engaged in research and development. This data is obtained from the most recent census (ABS Census, 2021).

Seventh, a diverse and skilled workforce, i.e., *talent*, is perhaps the most important factor for new venture creation. This report employs an indirect measure of entrepreneurial talent by examining the proportion of highly educated individuals within the population, alongside the percentage of prime-age people (aged 30-60). Highly educated individuals are defined as those holding a bachelor's degree or higher. This information is sourced from the latest census data (ABS Census, 2021).

Eighth, *knowledge* is another critical source of new firm opportunity. Innovations often arise from new knowledge, and areas with high levels of research and development activities tend to foster more entrepreneurship. This study measures innovation utilising RAI's innovation index that proxies for overall innovative activities in a specific area (Regional Australia Institute, 2011d). The total number of patent applications in the past five years as a share of the total number of businesses in a specific area were also used (IPLORD, 2023).

Ninth, *demand*, or sufficient purchasing power, is essential for entrepreneurial ventures to succeed. Local income levels and consumer demand fuel business growth and in turn contribute to higher purchasing power in a region. This study used disposable income per capita and total population as measures for demand (ABS Census, 2021).

Tenth, *intermediate* services, such as incubators, help reduce entry barriers for new ventures and shorten the time it takes to bring innovations to market. These services enhance startup success by offering critical resources, mentorship, and guidance. This study measures intermediate services as the number of accelerators and incubators as a proportion of SMEs (Crunchbase, 2024), along with the percentage of people employed in business service industries relative to the total population in a given area (ABS Census, 2021).

These variables are then combined to create the composite indicators for the ten elements of the entrepreneurial ecosystem. Each variable is normalised to a range of zero to one to ensure comparability. To avoid issues with outliers that may disproportionately influence the results, maximum values are capped to five standard deviations of the mean (Leendertse *et al.*, 2022).¹¹ After constructing the composite indicators, we standardise them to have a mean of zero and a standard deviation of one. This standardisation ensures equal weighting when building the entrepreneurial ecosystem index (Stam and Van de Ven, 2021; Leendertse *et al.*, 2022). Following previous studies, this report uses three methods to calculate the index. First, an additive entrepreneurial ecosystem index is constructed by summing the ten elements ($E1 + E2 + \dots + E10$). Second, a multiplicative

¹¹ Our results are robust when we cap maximum values to three or four standard deviations of the mean.

index is created by multiplying the ten elements together ($E1 * E2 * ... * E10$). Third, the index is computed using the natural logarithm of each element ($\ln(E1) + \ln(E2) + ... + \ln(E10)$) before adding them up.¹² Lastly, weights derived from a principal component analysis are applied to create a weighted additive index, assigning the appropriate weights to each of the ten elements.

Analysis is conducted at the Statistical Area Level 2 (SA2) following the Australian Statistical Geography Standard (ASGS) Edition 3 by the ABS. Data sourced from ABS is already measured at the SA2 level. However, for indicators from the Regional Australia Institute (RAI) or other sources, which were available at Local Government Area (LGA) or postcode levels, ABS correspondence files were utilised to convert them to SA2 areas, applying the appropriate ratios during the conversion process.

Table 9 presents the summary statistics of the ten elements and the entrepreneurial ecosystem indices. Uncapped maximum values are presented in the parentheses. It is evident that there is a lot of variation in the ecosystem elements across SA2 areas in Australia. For instance, average values range from 2 per cent for finance to 60 per cent for networks. In terms of the entrepreneurial ecosystem indices, analysis shows that the multiplicative startup ecosystem index produces an excessively large difference between the smallest and largest values, which does not reflect the actual data variation questioning its external validity (Leendertse *et al.*, 2022). Furthermore, the multiplicative index is weakly correlated with all the elements of the ecosystem as well as with the other entrepreneurial ecosystem indices (Table 11). Thus, this study relies on the additive, logarithmic and weighted additive indices

for further analysis. Due to its ease of interpretation, this report focuses on the additive index, however, the logarithmic and weighted additive indices provide similar results. Index scores for SA3, SA4, and Greater City areas are equal to the average score of the SA2 areas that make up these larger regions.

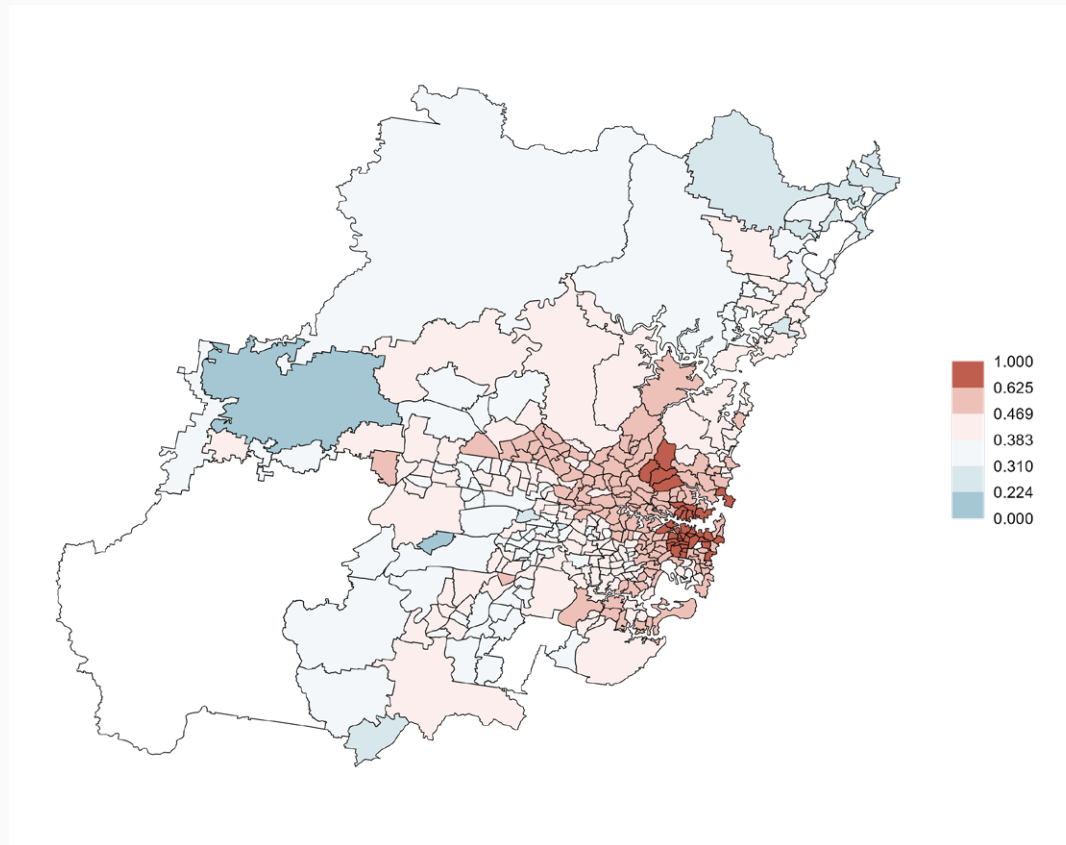
Principal component analysis (PCA) examines the interdependence of the ecosystem's elements. The first four components of these account for more than 77 per cent of the total variation. The first component accounts for 42 per cent of the variation, with eight out of ten elements showing strong loadings above 0.21. The top three elements with the highest loadings in this component are intermediate services (0.43), talent (0.42), and knowledge (0.40). The second component explains an additional 15.8 per cent of the variation, with demand (0.56), networks (0.53), and formal institutions (0.40) showing the highest loadings. The third component accounts for an additional 11.5 per cent of the variation, featuring entrepreneurship culture (0.70), leadership (0.49), formal institutions (0.28), and finance (0.28) as the strongest contributors. Finally, the fourth component explains an additional 8.5 per cent of the variation, with finance (0.59), networks (0.57), and entrepreneurship culture (0.39) exhibiting the highest loadings.

This study also assesses the predictive power of our entrepreneurial ecosystem indices. Table 18 shows that the additive, logarithmic, and weighted additive indices significantly predict higher numbers of startups per capita. This suggests that these indices effectively capture the underlying factors contributing to new venture creation and economic performance at the regional level.

¹² We do not standardise the composite indicators for the ten elements to a zero mean when calculating the startup ecosystem index using this method, as the natural logarithm of zero is undefined.

FIGURE 61

Entrepreneurial ecosystem index per SA2, Greater Sydney

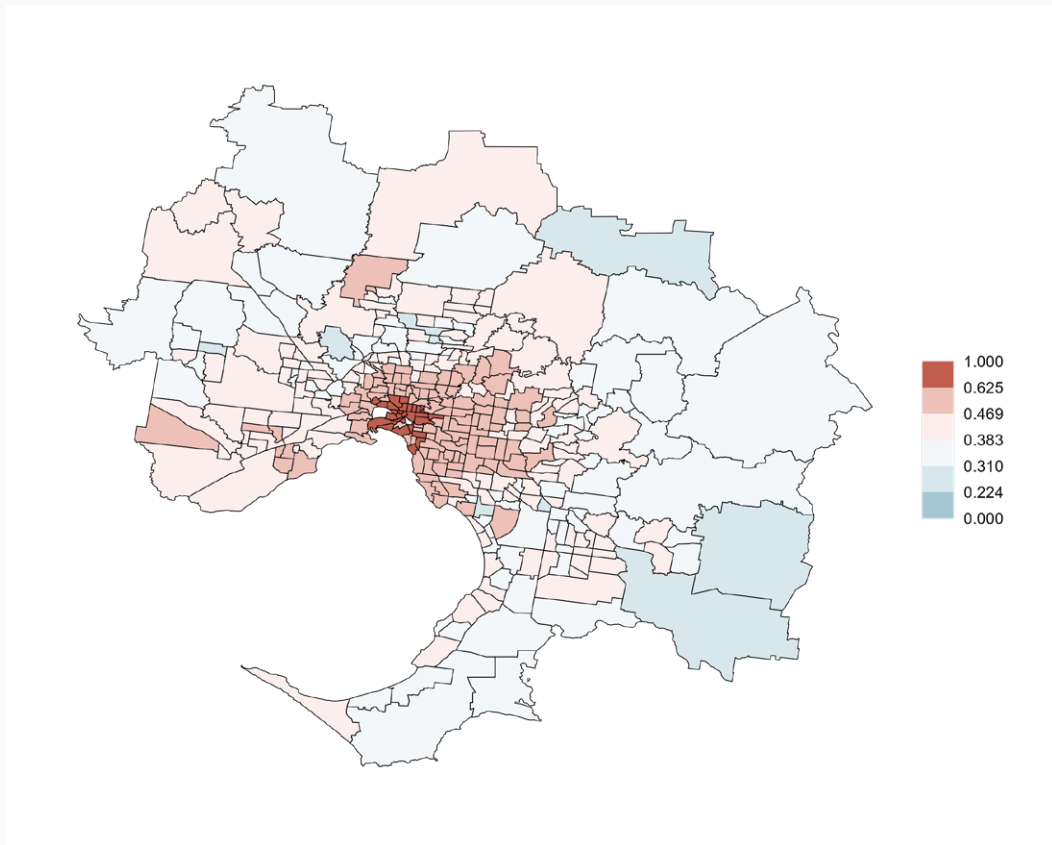


Notes: Index is normalised to range between a minimum of zero and a maximum of one.

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

FIGURE 62

Entrepreneurial ecosystem index per SA2, Greater Melbourne

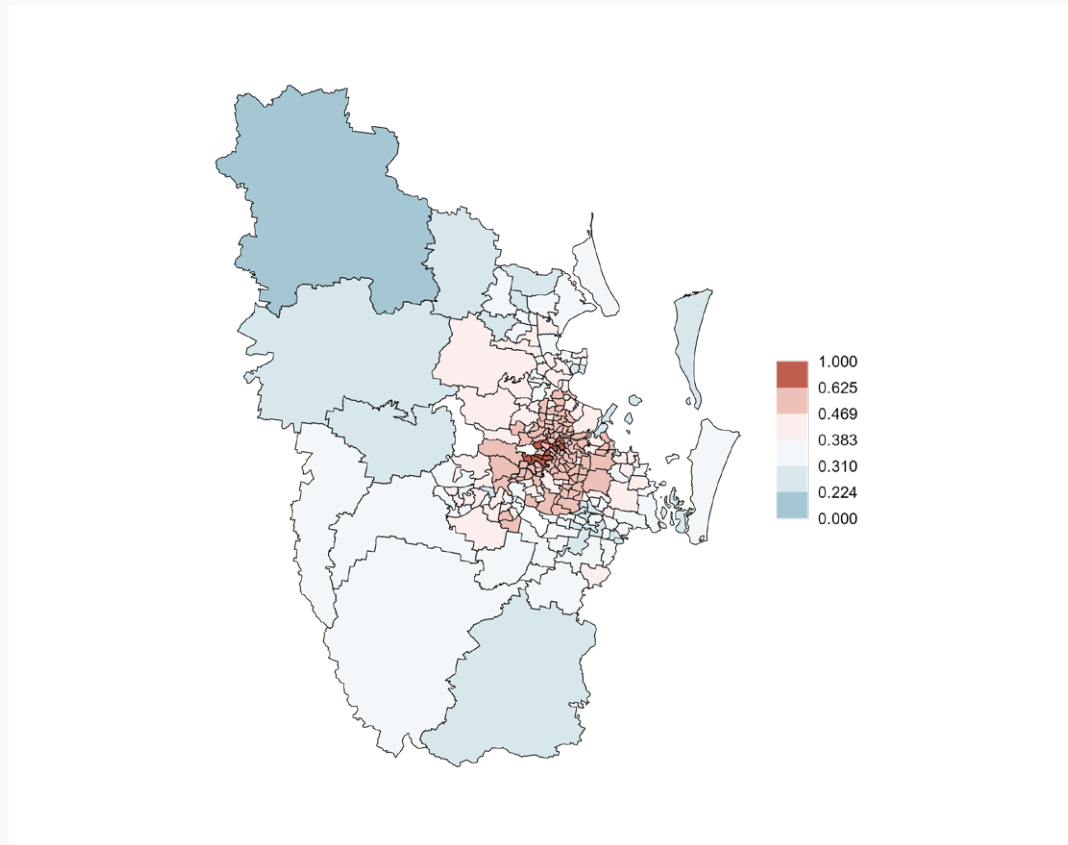


Notes: Index is normalised to range between a minimum of zero and a maximum of one.

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

FIGURE 63

Entrepreneurial ecosystem index per SA2, Greater Brisbane

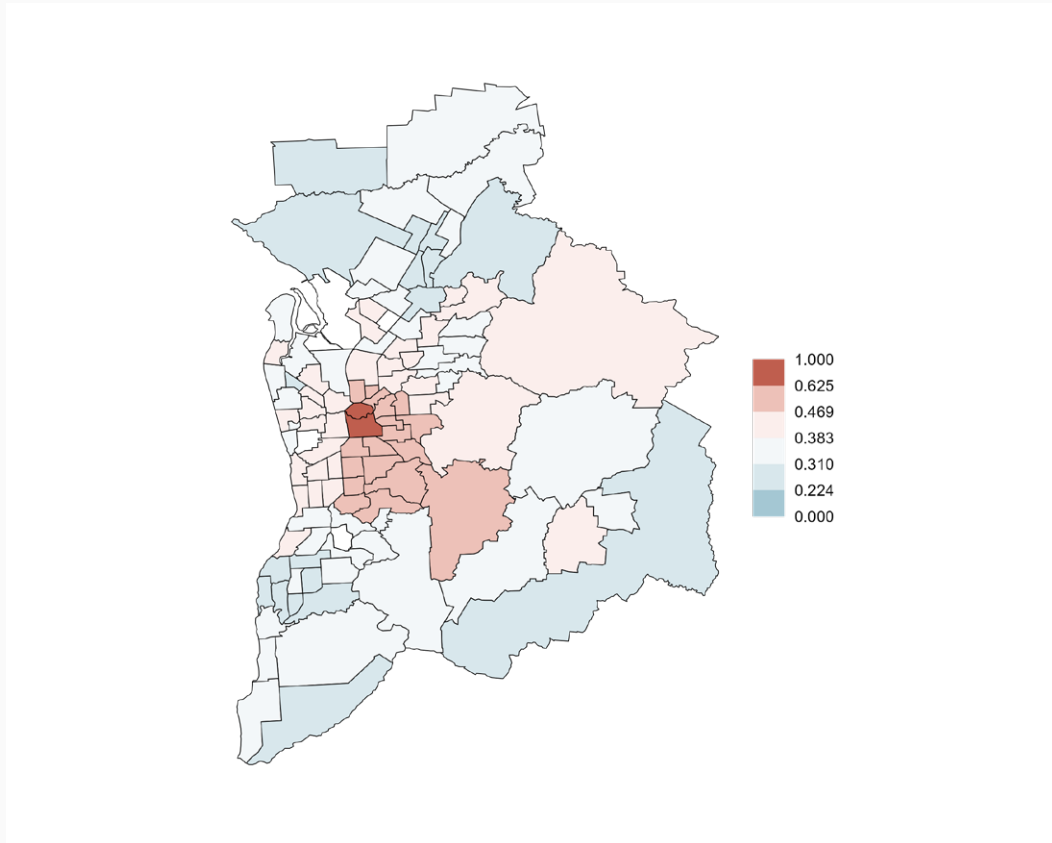


Notes: Index is normalised to range between a minimum of zero and a maximum of one.

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

FIGURE 64

Entrepreneurial ecosystem index per SA2, Greater Adelaide



Notes: Index is normalised to range between a minimum of zero and a maximum of one.

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

TABLE 9

Summary statistics of the elements of the ecosystem indicators and the entrepreneurial ecosystem indices

	Mean	Standard Deviation	Minimum	Maximum
Elements of the Ecosystem Indicators				
Formal Institutions	0.30	0.03	0.21	0.45 (0.53)
Entrepreneurship Culture	0.14	0.05	0.00	0.42 (1.00)
Networks	0.69	0.25	0.00	0.93
Physical Infrastructure	0.24	0.03	0.00	0.4 (0.47)
Finance	0.02	0.02	0.00	0.19 (0.53)
Leadership	0.07	0.05	0.00	0.31 (0.54)
Talent	0.16	0.08	0.00	0.56 (1.00)
Knowledge	0.08	0.06	0.00	0.39 (0.55)
Demand	0.42	0.15	0.00	0.84
Intermediate Services	0.07	0.06	0.00	0.39 (0.66)
Entrepreneurial Ecosystem Indices				
Additive	0.29	5.91	-17.95	27.73
Multiplicative	0.84	57.3	-898.89	1654.84
Logarithmic	1.88	0.35	0.53	3.00
Weighted Additive	0.06	1.74	-4.76	8.35

Notes: The composite elements of the ecosystem indices were standardised with zero mean and one standard deviation prior to the construction of the Additive and Multiplicative indices. Weighted Additive Index is calculated using weights produced by the PCA analysis. The uncorrected maximum values of each element are presented in the parentheses.

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

TABLE 10

Top and bottom percentile values of the entrepreneurial ecosystem indices

	Bottom 5%	Bottom 10%	Median	Top 10%	Top 5%
Entrepreneurial Ecosystem Indices					
Additive	-7.70	-6.50	-0.45	8.21	10.59
Multiplicative	-0.21	-0.03	0.00	0.05	0.22
Logarithmic	1.33	1.42	2.02	2.32	2.45
Weighted Additive	-2.04	-1.77	-0.28	2.49	3.20

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

TABLE 11
Pairwise Correlation Matrix

	Formal Institutions	Entrepreneurship Culture	Networks	Physical Infrastructure	Finance	Leadership	Talent	Knowledge	Demand	Intermediate Services	Additive Index	Multiplicative Index	Logarithmic Index	Weighted Additive Index
Formal Institutions	1													
Entrepreneurship Culture	0.090***	1												
Networks	-0.054***	0.177***	1											
Physical Infrastructure	0.207***	0.239***	0.207***	1										
Finance	0.450***	0.037*	0.052**	0.388***	1									
Leadership	0.256***	-0.052***	0.136***	0.328***	0.152***	1								
Talent	0.373***	0.188***	0.210***	0.568***	0.325***	0.589***	1							
Knowledge	0.584***	0.126***	0.000	0.543***	0.466***	0.486***	0.594***	1						
Demand	-0.035*	0.387***	0.536***	0.394***	0.071***	0.322***	0.369***	0.155***	1					
Intermediate Services	0.375***	0.136***	0.247***	0.587***	0.436***	0.630***	0.753***	0.610***	0.471***	1				
Additive Index	0.544***	0.307***	0.337***	0.727***	0.585***	0.613***	0.832***	0.790***	0.552***	0.861***	1			
Multiplicative Index	0.016	0.045**	-0.023	0.012	0.059***	0.030	0.006	0.010	-0.030	0.031	0.026	1		
Logarithmic Index	0.323***	0.297***	0.633***	0.646***	0.405***	0.536***	0.741***	0.612***	0.729***	0.777***	0.920***	0.000	1	
Weighted Additive Index	0.540***	0.191***	0.231***	0.725***	0.598***	0.673***	0.876***	0.818***	0.479***	0.902***	0.984***	0.027	0.866***	1

Notes: Stars *, **, and *** indicate statistical significance at the 10%, 5% and 1% level respectively.
Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

TABLE 12
Principal Component Analysis (PCA)

	PCA1	PCA2	PCA3	PCA4
Formal Institutions	0.268	-0.406	0.288	0.196
Entrepreneurship Culture	0.094	0.320	0.707	-0.399
Networks	0.113	0.538	-0.158	0.577
Physical Infrastructure	0.353	0.171	0.133	-0.033
Finance	0.282	-0.196	0.285	0.591
Leadership	0.329	-0.113	-0.494	-0.273
Talent	0.427	-0.017	-0.127	-0.160
Knowledge	0.404	-0.209	0.095	-0.114
Demand	0.237	0.565	-0.047	-0.068
Intermediate Services	0.438	0.017	-0.146	-0.035
<i>Proportion of Variance</i>	0.420	0.158	0.115	0.085
<i>Cummulative Variance</i>	0.420	0.578	0.693	0.778
<i>Eigenvalue</i>	4.201	1.584	1.149	0.855

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

TABLE 13
Top 20 SA2 areas with the highest entrepreneurial ecosystem index scores in NSW

SA3	SA2	Entrepreneurial Ecosystem Index
Sydney Inner City	Sydney (South) - Haymarket	26.0
Sydney Inner City	Darlinghurst	23.2
Sydney Inner City	Surry Hills	22.7
Sydney Inner City	Sydney (North) - Millers Point	22.7
Sydney Inner City	Erskineville - Alexandria	21.8
Sydney Inner City	Potts Point - Woolloomooloo	20.4
Sydney Inner City	Glebe - Forest Lodge	19.4
Sydney Inner City	Pymont	19.0
Sydney Inner City	Redfern	18.2
North Sydney - Mosman	Crows Nest - Waverton	17.9
North Sydney - Mosman	North Sydney - Lavender Bay	17.7
North Sydney - Mosman	Cremorne - Cammeray	16.7
Sydney Inner City	Chippendale	16.5
Sydney Inner City	Zetland	16.2
Eastern Suburbs - North	Paddington - Moore Park	15.2
Sydney Inner City	Newtown (NSW)	15.1
Sydney Inner City	Ultimo	15.0
Sydney Inner City	Waterloo	14.7
Sydney Inner City	Camperdown - Darlington	14.6
North Sydney - Mosman	Neutral Bay - Kirribilli	14.6

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

TABLE 14

Top 20 SA2 areas with the highest entrepreneurial ecosystem index scores in VIC

SA3	SA2	Entrepreneurial Ecosystem Index
Melbourne City	Melbourne CBD - North	27.7
Melbourne City	East Melbourne	27.4
Melbourne City	Docklands	26.7
Melbourne City	Southbank - East	26.3
Melbourne City	South Yarra - West	26.1
Melbourne City	Carlton	24.6
Melbourne City	Melbourne CBD - East	24.0
Melbourne City	Parkville	23.0
Melbourne City	Melbourne CBD - West	23.0
Melbourne City	North Melbourne	22.5
Melbourne City	Southbank (West) - South Wharf	21.3
Melbourne City	West Melbourne - Residential	20.4
Melbourne City	Kensington (Vic.)	17.4
Yarra	Richmond (South) - Cremorne	13.7
Port Phillip	Port Melbourne Industrial	13.1
Yarra	Carlton North - Princes Hill	12.6
Yarra	Fitzroy	12.5
Stonnington - West	Prahran - Windsor	12.3
Yarra	Abbotsford	12.2
Yarra	Richmond - North	12.2

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

TABLE 15

Top 20 SA2 areas with the highest entrepreneurial ecosystem index scores in QLD

SA3	SA2	Entrepreneurial Ecosystem Index
Brisbane Inner - West	Red Hill (Qld)	12.9
Brisbane Inner - North	Newstead - Bowen Hills	12.0
Brisbane Inner	West End	11.9
Kenmore - Brookfield - Moggill	Chapel Hill	11.6
Brisbane Inner	Spring Hill	11.3
Sherwood - Indooroopilly	Indooroopilly	11.2
Brisbane Inner	Brisbane City	11.0
Brisbane Inner - West	Bardon	10.9
Sherwood - Indooroopilly	St Lucia	10.9
Sherwood - Indooroopilly	Taringa	10.7
Brisbane Inner	New Farm	10.7
Kenmore - Brookfield - Moggill	Fig Tree Pocket	10.5
Brisbane Inner - West	Paddington - Milton	10.5
The Gap - Enoggera	The Gap	10.0
Brisbane Inner - North	Kelvin Grove - Herston	10.0
Brisbane Inner	Fortitude Valley	9.9
Brisbane Inner - East	Norman Park	9.9
Brisbane Inner - East	Bulimba	9.8
Brisbane Inner - West	Auchenflower	9.8
Brisbane Inner - West	Toowong	9.7

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

TABLE 16

Top 20 SA2 areas with the highest entrepreneurial ecosystem index scores in SA

SA3	SA2	Entrepreneurial Ecosystem Index
Adelaide City	Adelaide	26.6
Adelaide City	North Adelaide	24.8
Norwood - Payneham - St Peters	Norwood (SA)	10.1
Unley	Goodwood - Millswood	10.0
Unley	Unley - Parkside	9.8
Norwood - Payneham - St Peters	St Peters - Marden	8.9
Burnside	Burnside - Wattle Park	8.4
Mitcham	Mitcham (SA)	7.6
Burnside	Beaumont - Glen Osmond	7.6
Burnside	Toorak Gardens	7.0
Norwood - Payneham - St Peters	Payneham - Felixstow	6.7
Mitcham	Panorama	6.3
Mitcham	Blackwood	6.3
Prospect - Walkerville	Prospect	5.8
Mitcham	Belair	5.1
Mitcham	Colonel Light Gardens	4.7
Mitcham	Bellevue Heights	4.6
Adelaide Hills	Aldgate - Stirling	4.6
Prospect - Walkerville	Nailsworth - Broadview	4.6
Prospect - Walkerville	Walkerville	4.0

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

TABLE 17**Top 50 SA2 areas with the highest entrepreneurial ecosystem index scores in WA**

SA3	SA2	Entrepreneurial Ecosystem Index
Perth City	East Perth	21.5
Perth City	Perth (North) - Highgate	19.4
Cottesloe - Claremont	Nedlands - Dalkeith - Crawley	17.0
Perth City	Perth (West) - Northbridge	16.7
Perth City	Subiaco - Shenton Park	9.7
Cottesloe - Claremont	Swanbourne - Mount Claremont	7.3
Perth City	Mount Hawthorn - Leederville	6.6
Cottesloe - Claremont	Floreat	6.6
Cottesloe - Claremont	City Beach	6.5
South Perth	Como	6.3
Belmont - Victoria Park	Victoria Park - Lathlain - Burswood	6.3
Cottesloe - Claremont	Cottesloe	6.1
Perth City	Wembley - West Leederville - Glendalough	5.8
Belmont - Victoria Park	East Victoria Park - Carlisle	5.8
Cottesloe - Claremont	Mosman Park - Peppermint Grove	5.7
Stirling	Scarborough	5.6
Melville	Applecross - Ardross	5.5
South Perth	South Perth - Kensington	5.5
Fremantle	Fremantle	5.3
Melville	Booragoon	5.3
Perth City	North Perth	5.3
Fremantle	Fremantle - South	5.1
Stirling	Karrinyup - Gwelup - Carine	4.9
Perth City	Mount Lawley - Inglewood	4.8
Cottesloe - Claremont	Claremont (WA)	4.6
Stirling	Wembley Downs - Churchlands - Woodlands	4.5
Stirling	Innaloo - Doubleview	4.4
Fremantle	East Fremantle	4.0
Bayswater - Bassendean	Maylands	3.8
Melville	Melville	3.7
Bayswater - Bassendean	Bayswater - Embleton - Bedford	3.4
Canning	Bentley - Wilson - St James	3.3
Canning	Willetton	3.3
South Perth	Manning - Waterford	3.3
Melville	Bicton - Palmyra	3.2
Melville	Bull Creek	3.1
Joondalup	Duncraig	3.0
Canning	Cannington - Queens Park	2.8
Canning	Riverton - Shelley - Rossmoyne	2.6
Stirling	Stirling - Osborne Park	2.6
Joondalup	Sorrento - Marmion	2.5
Melville	Murdoch - Kardinya	2.5
Serpentine - Jarrahdale	Byford	2.5
Stirling	Tuart Hill - Joondanna	2.4
Stirling	Yokine - Coolbinia - Menora	2.1
Belmont - Victoria Park	Rivervale	2.0
Cockburn	North Coogee	2.0
Armadale	Harrisdale	2.0
Armadale	Piara Waters - Forrestdale	1.9
Melville	Winthrop	1.8

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

TABLE 18

The relationship between entrepreneurial ecosystem and startup creation

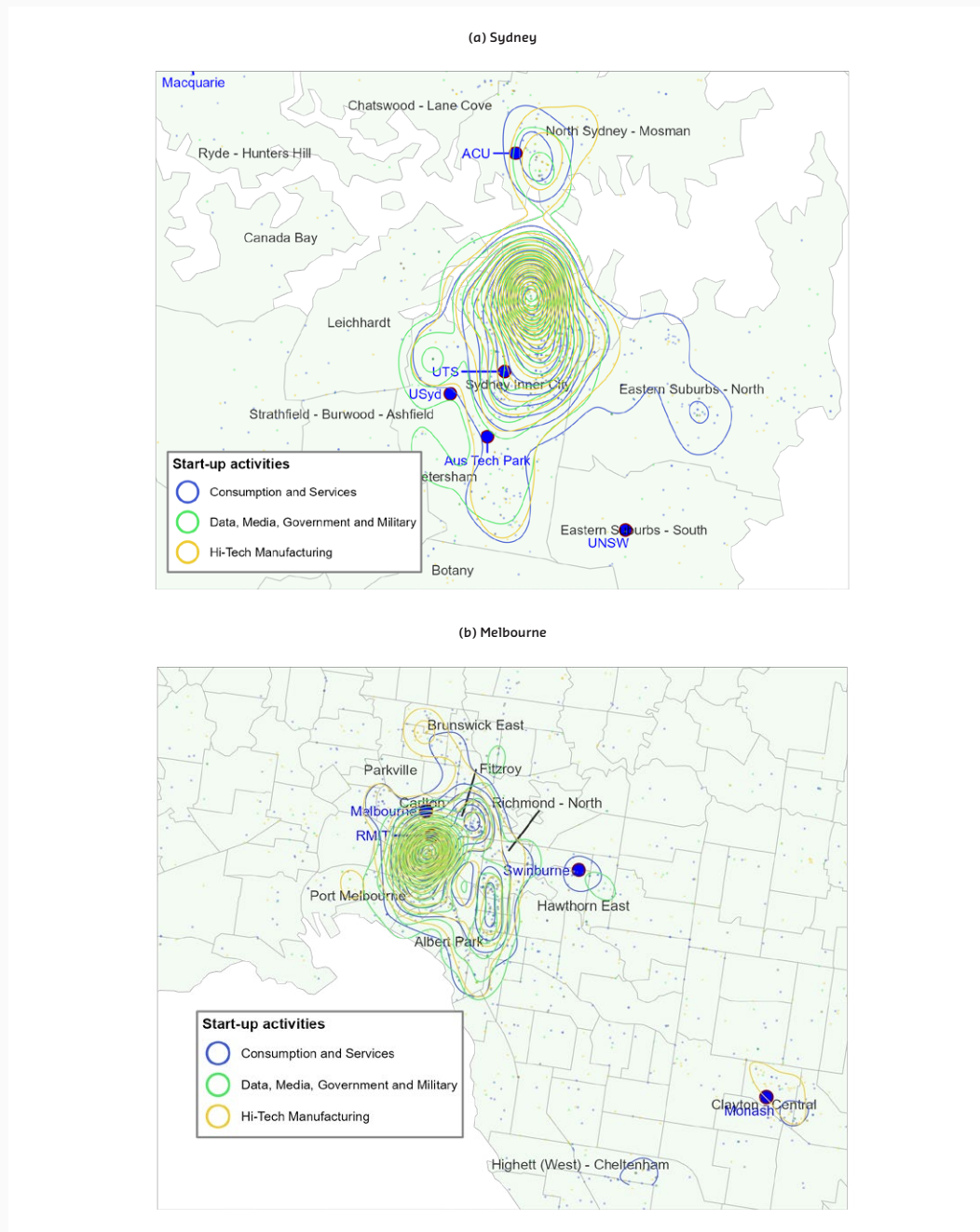
Number of Start-ups per capita			
Entrepreneurial Ecosystem Indices			
Additive	0.000382***		
	(3.26)		
Logarithmic	0.00324*		
	(1.71)		
Weighted Additive	0.00151***		
	(3.72)		
State Fixed Effects	Yes	Yes	Yes
Mean of Dependent Variable	0.002	0.002	0.002
Number of Observations	2138	2138	2138
R-squared	0.028	0.013	0.036

Notes: Robust t-statistics are presented in the parentheses. Stars *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively.

Source: Bankwest Curtin Economics Centre | Authors' calculations based on various data sources.

FIGURE 65

Density of startup companies: by state capital city locality and broad activity

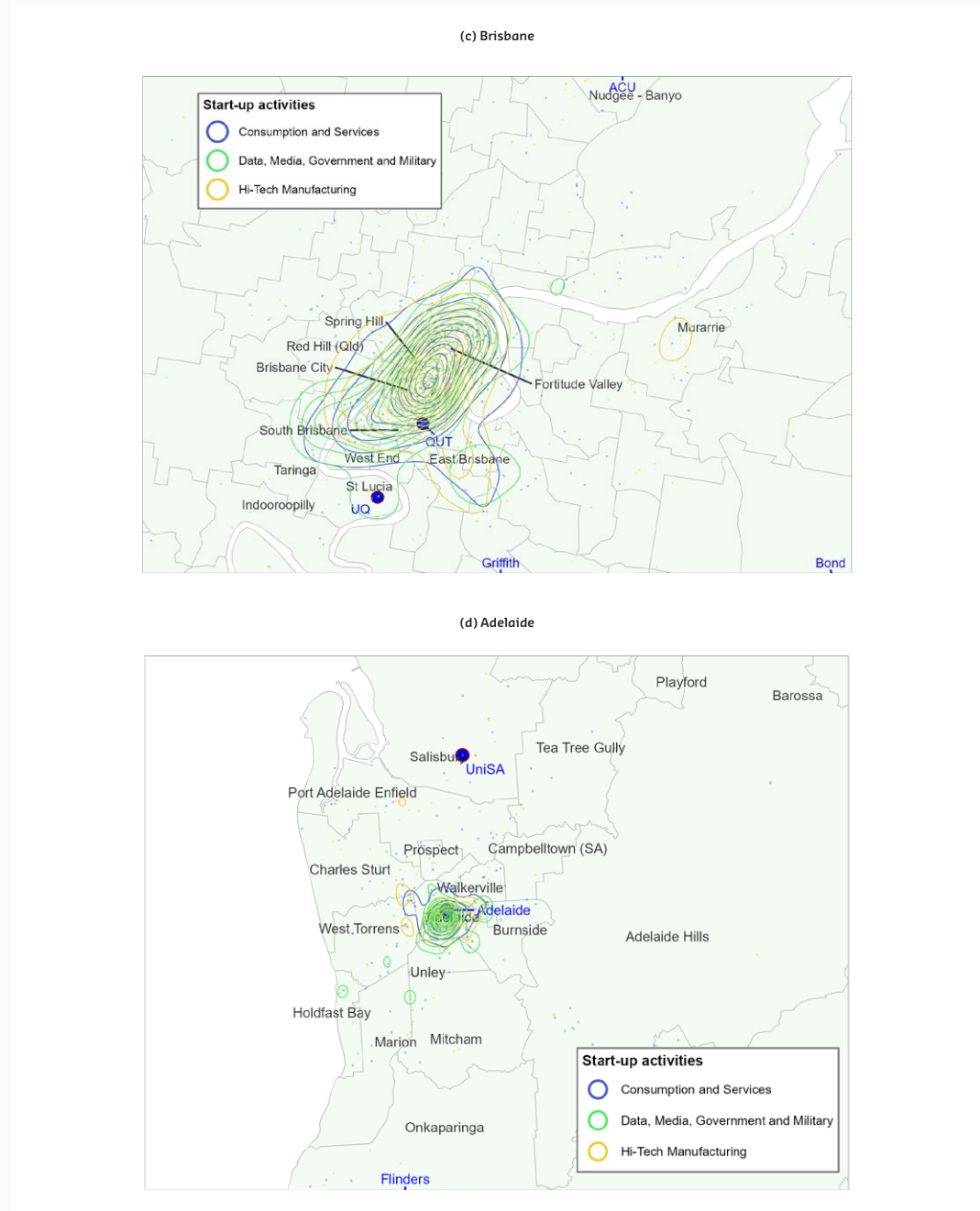


Notes: Each figure presents a contour diagram of the relative density of the number of startups in a given area. Densities and contours are calculated using unweighted kernel density estimation methods, with optimal bandwidth (smoothing parameter) and normal kernels.

Source: Bankwest Curtin Economics Centre | Authors' calculations using Crunchbase data, ABS area shapefiles, and coding in R using the *geom_density_2d* package.

FIGURE 65 (continued)

Density of startup companies: by state capital city locality and broad activity

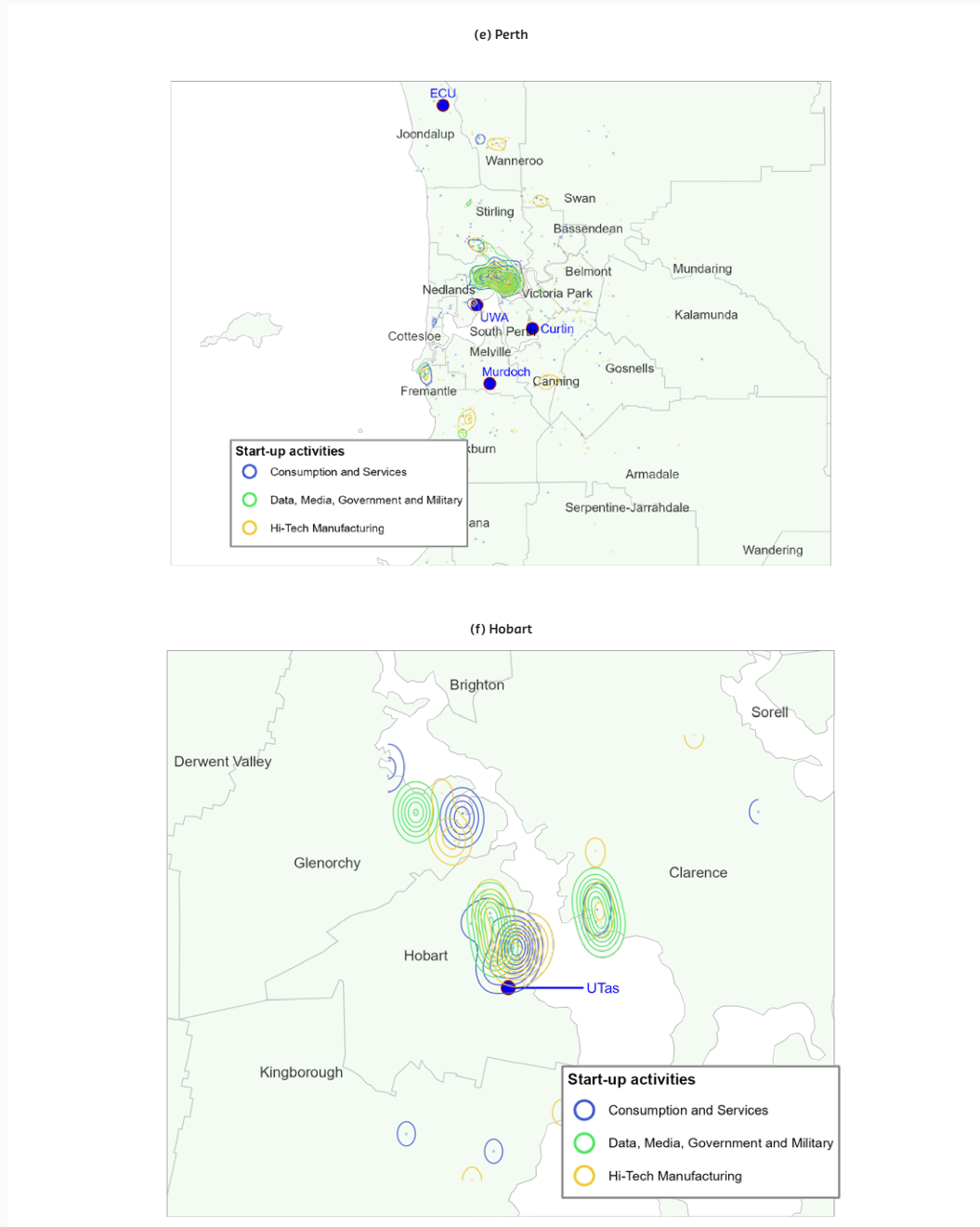


Notes: As for Figure 65 panel a and b.

Source: Bankwest Curtin Economics Centre | Authors' calculations using Crunchbase data, ABS area shapefiles, and coding in R using the *geom_density_2d* package.

FIGURE 65 (continued)

Density of startup companies: by state capital city locality and broad activity



Notes: As for Figure 65 panel a and b.

Source: Bankwest Curtin Economics Centre | Authors' calculations using Crunchbase data, ABS area shapefiles, and coding in R using the *geom_density_2d* package.

FIGURE 65 (continued)

Density of startup companies: by state capital city locality and broad activity



Notes: As for Figure 65 panel a and b.

Source: Bankwest Curtin Economics Centre | Authors' calculations using Crunchbase data, ABS area shapefiles, and coding in R using the *geom_density_2d* package.



GLOSSARY

GLOSSARY

Startups: A startup is a company in its initial stages of operations, built to solve a particular problem or address a specific need in the market. Unlike traditional businesses, startups often aim to grow aggressively over a short period, driven by innovation and a scalable business model.

Unicorns: A unicorn company is a privately held startup or tech firm that boasts an exceptional and somewhat rare attribute — a valuation of over \$1 billion. This financial milestone elevates these companies in the eyes of investors, entrepreneurs and the general public, as only a select few manage to attain such high valuations before going public or being acquired.

Stages of startup

Pre-seed stage: In the pre-seed phase, also considered the idea phase.

Seed stage: The seed phase is to validate the business model. This phase seeks the first materialisations of a startup. This can be done through developing prototypes, which are small experiments carried out to validate the initial idea upon which a startup is based. Its objective is the validation of the initial value hypothesis. An early stage prototype of a development does not need to be functional, nor a viable product. It is not to be confused with a minimum viable product, which must be both functional and viable.

Early stage: The early stage indicates the beginning of a phase in which the idea is left to evolve until it becomes a product or service in the market. It will not be the final version. The minimum viable product is a model that does not have its full functions, making the test less complex. It is released as a first version, with the results and information being collected. This phase is key and will help startups fully understand the effect they are having on the scenario that was prepared in the previous phases.

1. **Growth stage:** Strong market demand is met if a startup's product or service reaches this stage. This means that there will be upward figures in terms of new customers, recurring customers, and billing. Profitability here is paramount. This is when the team starts to grow, and recruitment begins.
2. **Expansion phase:** Faced with a more widespread definition of the term startup, a scaleup demonstrates a proven business model that allows it to consider more ambitious goals, for example, internationalisation, expansion to other sectors or hiring new professionals. In this phase, companies that have already advanced in the execution of their business model move forward, consolidating their growth in both revenue and employees.
3. **Exit phase:** This phase is not mandatory and does not always happen among startups. There are business models whose goal is to become a high value and long term company. However, it is very common for the last step to be to perform an exit by selling the startup. Even so, not many arrive at this stage and those who do are characterised by their strength, high potential, and opportunities to continue to grow. This output can occur in many ways, although three common options stand out: sale of the founders' shares to another company, acquisition by another company or an Initial Public Offering (IPO), which means their entry into sale.

Stages of Startup Funding

Pre-Seed funding refers to an investment in an idea. In other words, it's an investment in a product that has yet to find its market. Because pre-seed funding involves betting on an idea, it is typically more challenging to secure.

Seed funding is sought by businesses that have already proven a market need for their product. They simply need the money to get that product to market and obtain a foothold in their industry. Unlike loans, seed funding for startups generally doesn't need to be returned. This funding usually happens with angel investors, friends, and family.

Series A funding is for the startup companies that have developed a product and gained a customer base. They have functioning business models and have already started earning profits. In this stage, the money raised is further used to upgrade their business. Type of investors are usually venture capitalist firms.

Series B funding is about taking businesses to the next level, past the development stage. Investors help startups get there by expanding market reach. Companies that have gone through seed and Series A funding rounds have already developed substantial user bases and have proven to investors that they are prepared for success on a larger scale. Series B funding is used to grow the company so that it can meet these new levels of demand. Companies undergoing a Series B funding round are well-established, and their valuations tend to reflect that.

Series C funding is sought by businesses that are already quite successful. These companies seek additional funding to help them develop new products, expand into new markets, or even acquire other companies. Series C funding focuses on scaling the company, growing as quickly and successfully as possible. Series C funding is provided by groups such as hedge funds, investment banks, private equity firms, and large secondary market groups..

Initial public offering (IPO) is when a startup company invites the general public to invest in its shares. This is the final stage of startup funding, leading to a massive increase in the company's capital.

Types of startup funding

Angel investor:

- Contributes a significant amount of their personal money to an early stage firm. Most importantly, regardless of marital or tax filing status, an angel investor must have a total net worth of at least \$1 million.
- More interested in early stage enterprises, providing money for early market entry and late-stage technical development. Even if the business is not yet established an angel investor may be interested in investing in ventures they anticipate becoming successful.
- Typically invest between approximately around \$25,000 and \$100,000 of their personal money.
- Provides financial support to early startups with little to no involvement. An angel investor may offer advice on how to run the business, provide networks with lawyers, accountants and banks and assist in decision making.
- An angel investor expects a 30-40 per cent return on their money over the course of three to ten years.

Venture capitalist:

- Funds startup businesses with a combination of funds from huge enterprises, pension funds, and investment firms. These investors are referred to as limited partners.
- Prefers to invest in a company that can back up its claim to success with a proven track record of success and sustainability. The main goal of the investment is to assist already established businesses in developing and growing.

- They tend to invest more money into businesses than angel investors. They typically invest millions because they are funded by a groups of investor companies.
- A venture capitalist will assume responsibility for the development of a business's success and will be more involved in business decision making.
- A venture capitalist will expect a return of between 25-35 per cent.
- Some flexibility can be offered because these investments only make up a small portion of institutional investors' portfolio.

Bridge financing: Startups use bridge financing when they need additional capital between major funding rounds.

Funding rounds: Funding rounds are the number of times a startup goes back to the market to raise capital. The goal of every round is for founders to trade equity in their business for the capital they can utilise to advance their business to the next level.

Micro-lenders: Micro-lenders are non-profitable or private lenders who provide funds to businesses not qualified for acquiring standard business loans. These lenders assist small businesses as they can provide flexible terms and conditions.

Crowdfunding: Crowdfunding is the process through which entrepreneurs seek funding through online donations and campaigns. Startup capital is raised through public contributions.

Personal business loans or Bootstrapped: These startups are self-financed, often relying on the founders' savings, initial sales, or other non-external sources of revenue.

Family and friends: When startups raise money from family member or their social circle.

Incubators and Accelerators: Incubators and accelerators are organisations that provide resources and support to startups. They often offer funding, mentorship, and access to a network of investors.

Types of Innovation

Disruptive startups: These startups aim to revolutionise an industry by introducing innovations that challenge, and sometimes replace, the status quo. A classic example is Netflix, which transformed how we consume entertainment, pushing aside traditional video rental businesses.

Sustainable startups focus on making incremental improvements to existing products or services. Their innovations might offer better performance, greater efficiency, or other enhancements without radically changing how the industry operates.

Hybrid startups: They may introduce novel solutions that can coexist with traditional offerings, or pivot between strategies based on market feedback and conditions.

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