

Innovation policies

- 3.1 Governments have an important role to play in ensuring that its policies support growth and innovation. To stay competitive, businesses must innovate to achieve productivity gains and better meet the needs of customers.
- 3.2 Australia is a world leader in many areas of research, but performs poorly in translating research, through product and enterprise development, into investment in Australian businesses.
- 3.3 The Australian Private Equity and Venture Capital Association Limited (AVCAL) stressed that cohesive and well-thought out innovation policy is crucial for 'boosting investment into our most productive sectors, fostering competitiveness, creating jobs and helping build and future-proof the economy.'¹
- 3.4 Similarly, the Department of Industry, Innovation and Science (DIIS) acknowledged that governments have an important role to play in supporting innovation. It stated that these would include, for example, 'policies to encourage: investment in research and commercialisation; industry-research collaboration and skills and mentoring.'²
- 3.5 Australia is transitioning away from resources to innovation as a key driver of economic growth. AVCAL emphasised that in this environment, business investment in non-mining sectors is becoming an increasingly important ingredient in that growth, and that 'it is essential to ensure there is adequate and timely access to capital'.³

1 Australian Private Equity and Venture Capital Association Limited (AVCAL), *Submission 11*, p. 7.

2 Department of Industry, Innovation and Science (DIIS), *Submission 24*, p. 10.

3 AVCAL, *Submission 11*, p. 3.

- 3.6 While AVCAL observed that in the past Australia has fallen behind other economies across a number of innovation measures, it noted that the Australian Government's National Innovation and Science Agenda (NISA) has been crucial in getting Australia 'back on track to compete with the rest of the developed world'.⁴

National Innovation and Science Agenda

- 3.7 In December 2015, the Australian Government announced the NISA and committed \$1.1 billion over four years to measures focused on science, research and innovation as long-term drivers of economic prosperity, jobs and growth.
- 3.8 Australia does not have a strong track record in efficiently commercialising innovative ideas. The Global Innovation Index for 2018 ranked Australia at 21, up from 23 in the previous year. In the 2008-09 report Australia was ranked at 22.
- 3.9 The NISA complements the Australian Government's broader \$10 billion per annum investment in science, research and innovation systems 'to support businesses and researchers to innovate and succeed'.⁵

Table 3.1 List of NISA initiatives

Advancing quantum computing technology	Increasing access to company losses
Assessing the engagement and impact of university research	Incubator Support initiative
Attracting talent through reforms to Employee Share Schemes	Innovation and Science Australia
Biomedical Translation Fund to commercialise promising discoveries	Innovation Connections: connecting industry to innovation infrastructure
Business Research and Innovation Initiative	Innovation in agriculture and regional areas
Changes to Venture Capital Limited Partnerships	Inspiring all Australians in science, technology, engineering and mathematics
CSIRO Innovation Fund to commercialise early stage innovations	Inspiring Australians - Science Engagement Programme
CSIRO ON accelerator programme	Intangible asset depreciation
Cyber Security Growth Centre	Linkage Projects scheme: faster industry-research collaboration grants
Data sharing for innovation	Maintaining world class research infrastructure through the National Collaborative Research Infrastructure Strategy (NCRIS), the Australian Synchrotron and the Square Kilometre Array

⁴ AVCAL, *Submission 11*, p. 7.

⁵ DIIS, *Submission 24*, p. 12.

Data61: Australia's digital and data innovation group	Making it easier to access crowd-sourced equity funding
Digital Marketplace	New research funding arrangements for universities
Embracing the digital age	Opportunities for women in science, technology, engineering and maths
Global Innovation Strategy	Supporting innovation through visas
Improving insolvency laws to encourage innovation	Tax incentives for investors

Source DIIS, *Boosting innovation and science*, <<https://www.industry.gov.au/strategies-for-the-future/boosting-innovation-and-science>>, accessed 23 November 2018.

- 3.10 DIIS noted that the NISA targets impediments to business investment across all sectors of the economy through facilitating 'higher business investment by co-investing to commercialise promising ideas through initiatives like the Entrepreneurs Programme's \$23 million Incubator Support measure and the Accelerating Commercialisation measure.'⁶
- 3.11 The Entrepreneurs' Programme uses a public-private partnership model. It offers support to businesses in the areas of: accelerating commercialisation; business management; incubator support; and innovation connections. DIIS described the Entrepreneurs' Programme as:
- ...much more targeted towards innovative companies or firms that really need to become more innovative if they're going to keep on surviving and growing, and be successful in a much more globally competitive marketplace. It makes best use of utilising independent, private, expert advisers, who can be that first point of contact with the business – so it's not with government officers.⁷
- 3.12 By October 2018, 335 grants totalling more than \$166 million had been provided to businesses to commercialise innovative technologies. The grants comprise matched funding of up to \$1 million to cover eligible commercialisation costs and help companies take their products to market.⁸

6 DIIS, *Submission 24*, p. 12.

7 Mr David Wilson, Acting Head of Division, Science and Commercialisation Policy Division, DIIS, *Committee Hansard*, 7 August 2018, p. 10.

8 The Hon Karen Andrews MP, Minister for Industry, Science and Technology, 'Funding takes clever products to market', *Media release*, 10 October 2018, <<https://www.minister.industry.gov.au/ministers/karenandrews/media-releases/funding-takes-clever-products-market>>, accessed 20 November 2018.

3.13 AVCAL told the committee that the NISA has been a ‘very important catalyst’ for Australia’s innovation economy, as it provided a clear signal from the government that investing in innovation is important.⁹

3.14 However, it contended that this has just ‘caught us up from where we were to where we need to be’,¹⁰ and so the challenge still remains for Australia to maintain the momentum and progress in this area. AVCAL identified a need for a NISA mark 2.0, and stated:

NISA is not a task that we can tick the box on now and move on to other things. This must remain a continual area of focus...¹¹

Encouraging innovation

Research and development

3.15 DIIS commented that business research and development (R&D) activities are a key driver of productivity and economic growth. It stated that:

There is overwhelming evidence that firms that do undertake more innovative activity – for example, they invest in R&D or the right skills and talent – are better placed to be competitive and to export and compete in global markets and global supply chains.¹²

3.16 However, DIIS observed that ‘left to themselves, businesses tend to underinvest in R&D.’¹³ DIIS attributed this inclination for businesses to underinvest in R&D to:

- an inability to appropriate all the benefits of their R&D (as benefits tend to ‘spill over’ to the rest of society);
- difficulties in obtaining financing due to the inherent uncertainty of R&D; and
- tax treatment of losses discouraging risk-taking investments.¹⁴

3.17 CSL and Cochlear observed that Australia’s predominantly government funded research sector, primarily universities and the Commonwealth Scientific and Industrial Research Organisation (CSIRO), are highly

9 Mr Yasser El-Ansary, Chief Executive, AVCAL, *Committee Hansard*, 31 July 2018, p. 17.

10 Mr Yasser El-Ansary, Chief Executive, AVCAL, *Committee Hansard*, 31 July 2018, p. 20.

11 Mr Yasser El-Ansary, Chief Executive, AVCAL, *Committee Hansard*, 31 July 2018, p. 20.

12 Mr David Wilson, Acting Head of Division, Science and Commercialisation Policy Division, DIIS, *Committee Hansard*, 7 August 2018, p. 10.

13 DIIS, *Submission 24*, p. 13.

14 DIIS, *Submission 24*, p. 13.

productive and globally recognised for high quality research. However, they contended that overall Australian investment in innovation and R&D by government and business needs to increase. They submitted that:

Australia's gross expenditure on R&D (GERD) is currently at about 1.8% while top performing nations are around 3.69%. Business expenditure on R&D (BERD) is particularly low (1.01% as at 2015). This needs to dramatically improve if we are to be real competitors in the innovation race.¹⁵

- 3.18 In 2017, CSL and Cochlear were two of only four Australian companies on the list of top 1,000 global R&D spenders, both with R&D intensity of over 10 per cent. They are the nation's two largest innovation-focused advanced manufacturing companies and compete globally from an Australian base.
- 3.19 In addition to its substantial R&D and manufacturing base in Melbourne, CSL also noted that it has very substantial R&D and manufacturing operations in the United States, Europe and the United Kingdom, with more than 20,000 staff in 32 countries.
- 3.20 CSL noted that the competition among peer nations for advanced R&D and manufacturing is intense. They stressed the importance of the Australian Government continuing to support business to conduct R&D. These companies stated that they:
- ...regularly receive offers of various incentives to perform R&D offshore and we suggest that proactive policies to retain and incentivise the sort of real, intensive, R&D performed by these companies should be core to Australia's industry policy.¹⁶
- 3.21 CSL and Cochlear cautioned that when businesses move their R&D offshore the consequences are that 'intellectual property moves offshore, tax is paid offshore and highly desirable R&D jobs are added outside Australia.'¹⁷
- 3.22 Cochlear acknowledged that the million-dollar funding from the Australian Government 30 years ago, and government initiated pairing with Graeme Clark's bionic ear and the venture capital Nucleus Group, were instrumental in its path to success.

15 CSL and Cochlear, *Submission 13*, p. 18.

16 CSL and Cochlear, *Submission 13*, p. 19.

17 CSL and Cochlear, *Submission 13*, p. 19.

3.23 Cochlear recognised the importance of this early stage support and told the committee that as part of its own innovation fund, it has set aside approximately \$20 million to invest in Australian businesses. It explained that it has:

...invested in about four or five different companies in Australia which are start-ups, and these are companies which we think have great potential down the track which might be snapped up by Medtronic or someone else down the track if it weren't for us giving them some initial funding.¹⁸

Tax measures

3.24 The Australian Government uses tax incentives as a tool to encourage innovation. The Research and Development Tax Incentive (R&DTI) aims to encourage innovation through research and development. DIIS stated:

The objective of the program is to support industry to conduct R&D activities that might otherwise not be conducted...in order to raise investment in these activities towards the socially optimal level.¹⁹

3.25 The R&DTI provides a tax offset for some of the cost of a company doing eligible R&D activities by reducing its income tax liability. The offsets are 43.5 per cent (a refundable offset) and 38.5 per cent for costs. To apply for the offset, at a minimum, an incorporated company must:

- conduct eligible core R&D activities – defined as experiments that are guided by hypotheses and conducted for the purpose of generating new knowledge, and
- have incurred eligible R&D expenditure or notional deductions of at least \$20,000 (unless using a Research Service Provider or a Cooperative Research Centre).

3.26 DIIS noted that Australia's approach to stimulating business R&D activities through the tax system aligns with the approaches of other developed countries.²⁰

18 Mr Brent Cubis, Chief Financial Officer, Cochlear, *Committee Hansard*, 1 August 2018, pp. 28-29.

19 DIIS, *Submission 24*, p. 13.

20 DIIS, *Submission 24*, p. 13.

- 3.27 In the 2018-19 Budget, the Government announced changes to the R&DTI to address issues identified in the 2016 review of the program. While noting that the R&DTI was the largest component of Australian Government support for innovation in 2013-14, the 2016 review found that the program fell 'short of meeting its stated objectives of additionality and spillovers.'²¹
- 3.28 DIIS noted that the changes announced to the R&DTI included:
- improving the integrity of the R&DTI, helping ensure ineligible R&D claims are denied;
 - continuing support for smaller companies that undertake R&D activities; and
 - refocusing support for larger companies towards those undertaking additional, higher intensity R&D.²²
- 3.29 The Business Council of Australia supported maintaining the R&DTI to encourage innovative activity. However, it cautioned that an 'intensity-based scheme will bring unintended consequences and add complexity.'²³
- 3.30 Consult Australia recommended the following further changes be made to the R&DTI:
- The presence of innovation within a project should be sufficient to allow a company to make an R&D Tax Incentive claim. The R&D Tax Incentive should be targeted to reward the outcome rather than the process, and the law should reflect this.
 - Truly novel ideas for innovation in the internal business administration space should also be considered with regards to R&D.
 - The Department should review the terminology of the application for the R&D Tax Incentive to achieve clearer, simpler, less bureaucratic terminology which recognises and rewards the consulting engineering and related services industry's contribution to R&D, and specifically, the target of the R&D Tax Incentive scheme.²⁴
- 3.31 CSL and Cochlear commented that they welcomed the 2018-19 Budget announcement to increase the cap on eligible expenditure from \$100 million to \$150 million.²⁵

21 Mr Bill Ferris AC, Chair, Innovation Australia; Dr Alan Finkel AO, Chief Scientist; and Mr John Fraser, Secretary to the Treasury, *Review of the R&D Tax Incentive*, April 2016, p. 2.

22 DIIS, *Submission 24*, p. 13.

23 Business Council of Australia, *Submission 29*, p. 7.

24 Consult Australia, *Submission 31*, p. 23.

25 CSL and Cochlear, *Submission 13*, p. 7.

- 3.32 The NISA also included other tax incentives aimed to encourage investments in qualifying start-ups and to attract capital to enable these businesses to grow.²⁶
- 3.33 The Early Stage Investor Tax Offset, for example, provides concessional tax treatment for investments made in qualifying early stage innovation companies such as start-ups with high growth potential.²⁷ The incentive applies to angel investors and high-net-worth individuals who invest in more risk and early stage companies.
- 3.34 Another measure to support businesses pursuing innovation is increasing access to company losses by relaxing the 'same business test' and introducing a 'similar business test'. Companies are able to access losses made in previous financial years where they have entered into new business or transaction types.
- 3.35 DIIS submitted that the Australian Government has also improved the tax treatment of asset depreciation. Under this measure, businesses can 'self-assess the tax effective life of acquired intangible assets currently set by statute, to better align with the actual number of years the asset provides an economic benefit.'²⁸
- 3.36 CSL and Cochlear noted that peer nations use various tax measures to appeal to innovation focused companies. It stated:
- The aim of having competitive tax rates is to attract investment to Australia instead of having it go to peer nations – all of whom are equally looking to innovative industries in order to generate new skilled employment, help offset the decline in conventional manufacturing, capitalise on valuable government investment in R&D and education, and thereby contribute to the broader economy.²⁹
- 3.37 CSL and Cochlear noted that they both maintain their global centres of R&D in Australia. They submitted that the level and availability of government support is important in making Australia attractive for R&D.

26 DIIS, *Submission 24*, p. 12.

27 This is provided for in Division 360 of the *Income Tax Assessment Act 1997*.

28 DIIS, *Submission 24*, p. 12.

29 CSL and Cochlear, *Submission 13*, p. 18.

3.38 CSL and Cochlear indicated that R&DTI encourages commercial operators like them to conduct R&D in Australia and to maximise the amount of that investment. They stated that:

For the purposes of the R&D tax incentive, in 2016/17 CSL's qualifying R&D expenditure was AUD \$100m (from a global R&D spend of USD\$645m). Cochlear's eligible expenditure was AUD\$100m (from a global R&D spend of AUD\$152m).³⁰

3.39 Similarly, the Minerals Council of Australia acknowledged that the R&DTI is 'an effective, economy-wide, market-driven measure that encourages investment in innovation.'³¹ It also indicated its support for maintaining the incentive and not distorting it 'by restricting eligible on the basis of industry, firm size, R&D intensity or any other arbitrary criterion.'³²

3.40 KPMG proposed that the Australian Government's innovation policy on providing incentives could also explore more imaginative options.

3.41 It noted the current 20 per cent non-refundable offset with a maximum of \$200,000 to encourage 'mums and dads' to invest in start-ups and early innovation companies, but suggested that government should also 'allow losses to be transferred from companies to a similar start-up regimes for cash on the proviso that that investor, the company transferring the losses, would also invest a multiple of that loss transfer amount'.³³

3.42 KPMG proposed introducing a specific Innovation Company taxation regime that would apply to companies that have outgrown being classified as an early stage innovation company for tax purposes. The objective would be to reduce movement of innovative businesses offshore.

3.43 It outlined that monetisation of the innovative company's tax losses would enable the company to transfer these losses – to be capped at a percentage of salary expenditure – to another company. The second company would then 'pay full consideration for the tax benefit of the loss at the prevailing corporate income tax rate.'³⁴

3.44 To be eligible for the tax benefits associated with the first company's loss, the second company would be required to make an equity investment in

30 CSL and Cochlear, *Submission 13*, p. 19.

31 Minerals Council of Australia, *Submission 17*, p. 16.

32 Minerals Council of Australia, *Submission 17*, p. 16.

33 Mr Grant Wardell-Johnson, Partner, Economics and Tax Centre, KPMG, *Committee Hansard*, 31 July 2018, p. 6.

34 KPMG, *Submission 21*, p. 18.

the first company to a multiple of the loss amount, and to maintain the investment for two years.

- 3.45 KPMG submitted that by the innovative company 'selling its tax loss', it would receive a cash injection which would enable it to 'hire additional staff and increase its innovative activities.'³⁵
- 3.46 KPMG commented that this loss transfer approach would encourage high worth individuals to invest. It stated that this approach:
- ...gives cash to start-up companies. You'd have requirements surrounding that, which would mean that the start-up could only use that cash for salary and wages, and you'd have other caps et cetera. ...I think that would be a better way of trying to deal with a problem that we have at the present time – that is, as soon as companies reach a certain size they tend to go to the west coast of the US or elsewhere because they can't get the investment dollars from a particular sort of band within society.³⁶
- 3.47 Private equity funding is an important source of non-government external funding for a business looking to innovate.
- 3.48 AVCAL stressed the importance of adequate and timely access to capital to enable businesses to innovate. It noted that 85 per cent of private equity backed businesses introduced some type of process or product innovation in the 2016 financial year, which was 'far greater than the average profile of non-PE backed businesses.'³⁷
- 3.49 AVCAL argued that while the early-stage venture capital limited partnership regime (ESVCLP) and the venture capital limited partnership regime (VCLP) have been around for some time, one of the significant NISA changes was the 10 per cent tax offset for institutional investors like superannuation funds to be able to invest in that part of the market. It acknowledged that this measure was not the only driver of investment, but stated that:

Institutional investors, be they domestic or offshore, certainly do value to a very significant extent the importance of that certainty and signalling about the future.³⁸

35 KPMG, *Submission 21*, p. 18.

36 Mr Grant Wardell-Johnson, Partner, Economics and Tax Centre, KPMG, *Committee Hansard*, 31 July 2018, p. 6.

37 AVCAL, *Submission 11*, p. 13.

38 Mr Yasser El-Ansary, Chief Executive, AVCAL, *Committee Hansard*, 31 July 2018, p. 17.

Private and public research collaborations

3.50 DIIS submitted that Australian businesses that collaborate with publicly funded research organisations are ‘over three times more likely to achieve annual productivity growth.’³⁹ However, it stated that:

Australia's levels of business-research collaboration are among the lowest in the OECD, particularly for SMEs [Small and Medium Enterprises] as many lack the capabilities and networks necessary to identify and engage high quality research.⁴⁰

3.51 Further, DIIS noted that there are barriers to businesses engaging with the research sector. It stated:

There are cultural differences, for a start. Businesses are also short of time. They can feel that there are risks around investing their money without a clear understanding of what would be the benefits.⁴¹

3.52 DIIS indicated that the Australian Government supports business-research through a range of NISA measures, including the Industry Growth Centre initiatives and extending the Entrepreneurs’ Program to assist SMEs to collaborate with the research sector.⁴²

3.53 The Cooperative Research Centres (CRC) Program is one of the key programs aimed at helping businesses engage more with the knowledge and skills in the research sector. The CRC Program provides support to industry, research and the community through:

- grants (up to 10 years) to support medium to long terms industry-led collaborative research, and
- CRC-Projects grants (up to 3 years) to support short term, industry-led collaborative research.

3.54 In particular, the CRC-Projects stream is targeted at SMEs. DIIS outlined that:

SMEs with a good idea can collaborate and partner with a research organisation. They can get grant funding of up to \$3 million over three years to undertake a project that can really go towards the

39 DIIS, *Submission 24*, p. 14.

40 DIIS, *Submission 24*, p. 14.

41 Mr David Wilson, Acting Head of Division, Science and Commercialisation Policy Division, DIIS, *Committee Hansard*, 7 August 2018, p. 11.

42 DIIS, *Submission 24*, p. 14.

business needs and what they can draw on from the research community.⁴³

- 3.55 In a 2012 review, the Allen Consulting Group found that the CRC program 'delivers a 3:1 return on investment, citing examples such as \$120 million in value added by the HEARing CRC technology used by Cochlear.'⁴⁴
- 3.56 The CRC Projects part of the program, introduced in 2015, provides SMEs with opportunities to build their capacity to grow and adapt to changing markets.

National Research Infrastructure

- 3.57 DIIS acknowledged that governments have a role to play in ensuring the availability of strong research infrastructure.
- 3.58 The National Collaborative Research Infrastructure Strategy (NCRIS), a NISA initiative, is a national network of research infrastructure projects that support high-quality research aimed at driving greater innovation in the Australian research sector and the economy more broadly.
- 3.59 DIIS noted that Australian businesses can access the 42 National Research Infrastructure (NRI) facilities by co-investment arrangements or through fee-for-service agreements. It noted that businesses access the facilities to:
- ...create and test new concepts and improve existing processes and products. Businesses also support these facilities, providing consumables, equipment and advice. Further, NRI facilities offer unprecedented opportunities for collaboration with researchers – bringing together individuals from across institutions and sectors.⁴⁵
- 3.60 It is expected that the NRI will play a role in 'equipping Australian businesses to remain competitive with a transitioning economy.'⁴⁶

43 Mr David Wilson, Acting Head of Division, Science and Commercialisation Policy Division, DIIS, *Committee Hansard*, 7 August 2018, p. 11.

44 DIIS, *Submission 24*, p. 14.

45 DIIS, *Submission 24*, p. 15.

46 DIIS, *Submission 24*, p. 15.

Venture capital

- 3.61 While venture capital is an important source of funding for business investment generally, it is particularly important for investment in innovation.
- 3.62 However, AVCAL cited the *Innovation System Report 2017* observation that OECD data showed that 'Australian VC investment as a proportion of GDP continues to rank significantly below other OECD countries at 0.013 per cent of GDP, compared to an OECD average of 0.054 per cent.'⁴⁷ However, it acknowledged that the Australian venture capital sector has 'enjoyed a resurgence over recent years'.⁴⁸
- 3.63 DIIS observed that that there is 'a market failure in Australia in terms of the size of the venture capital sector and the availability of risk capital.'⁴⁹ However, it advised that the Australian Government has been working to address these market failures, and stated:
- Government has been a key driver of growth in the venture capital and early-stage sort of investment space through some of its tax concession programs – and I mentioned the investor tax offset before and our early-stage venture capital partnerships program. We've also had some co-investment funds that have been targeted very specifically at certain sectors, like the biomedical and health sectors.⁵⁰
- 3.64 NISA initiatives included changes to Venture Capital Limited Partnerships.
- 3.65 CSL and Cochlear noted that the ESVCLP program aims to increase investment in early stage venture capital businesses by providing a flow-through tax incentive and exemption on an investor's share of a fund's income.
- 3.66 They noted that while the program was initially aimed at attracting foreign capital, in 2007 it was expanded to incentivise Australian-based early stage venture capital.
- 3.67 However, CSL and Cochlear recommended that the Australian Government re-examine initiatives aimed at encouraging Australian based

47 AVCAL, *Submission 11*, p. 8.

48 AVCAL, *Submission 11*, p. 8.

49 Mr David Wilson, Acting Head of Division, Science and Commercialisation Policy Division, DIIS, *Committee Hansard*, 7 August 2018, p. 11.

50 Mr David Wilson, Acting Head of Division, Science and Commercialisation Policy Division, DIIS, *Committee Hansard*, 7 August 2018, p. 11.

capital investment in early stage and mature life sciences companies. They submitted that the program was not working as it should to support Australian innovation. It provided a case study that:

In 2017 Innovation and Science Australia's Innovation Investment Committee declined to register Cochlear and its investment partners Macquarie University and RIDBC under the ESVCLP program. This was because Cochlear's investment exceeded 30% of the total committed capital. Under the relevant legislation only exempt financial institutions are able to exceed this amount. However the Board may also exercise a discretion to allow a partner to exceed this amount. It had not previously exercised the discretion, declined to on this occasion and still has not.⁵¹

- 3.68 CSL and Cochlear recommended that the Australian Government issue guidelines to ensure that the Board can provide exemptions for companies that demonstrate 'an active, sizeable commitment to Australian innovation.'⁵²
- 3.69 Alternatively, CSL and Cochlear proposed developing support for corporate venture activities, where large firms take an equity stake in a small innovative company, and provide management and marketing expertise. This will provide these innovative enterprises with a competitive advantage and improve their viability.

Co-investment

- 3.70 Government co-investment with private enterprises has played an important part in supporting innovation by businesses. Australia and other countries are investing in high growth, innovative companies, and in doing so are attracting private capital from sectors of the economy where there is a market or investment gap.
- 3.71 The Biomedical Translation Fund (BTF) is a leading example of a current co-investment program. The BTF provides companies with venture capital through licensed private sector fund managers to develop and commercialise biomedical discoveries in Australia. This NISA initiative involves a \$501.25 million fund, with \$250 million from the Australian Government and \$251.25 million in private sector capital.

51 CSL and Cochlear, *Submission 13*, p. 15.

52 CSL and Cochlear, *Submission 13*, p. 15.

- 3.72 AVCAL recommended that the Australian Government consider applying the BTF model more broadly in terms of the types of companies to be supported.
- 3.73 It also proposed introducing a national innovation fund, to catalyse new co-investing opportunities in parts of the market that do not tend to attract capital. AVCAL described its proposed approach as very similar to the Innovation Investment Fund previously in place, but would involve broadening the sorts of companies that could be supported. It would be a 'matching scheme where private investors, alongside government, would pull together funds and then that money would be invested by professional venture capital managers'.⁵³
- 3.74 AVCAL submitted that a partnership arrangement such as this, which is not a grant, is a smart way for governments to utilise limited resources to catalyse activity in the private sector. It stated:
- There are not many areas of policy where you can quite directly make a link between government expenditure and the creation of an asset. There are many indirect links, but this is one area of policy where we think there's fertile ground to do much more in the future...⁵⁴
- 3.75 AVCAL suggested that a National Innovation Fund should include:
- a minimum government contribution of \$500 million over two years (with returns reinvested)
 - matching capital commitments from private investors and government, and
 - a competitive bid process.⁵⁵
- 3.76 The committee noted there is currently a CSIRO Innovation Fund of up to \$200 million to support the early stage commercialisation of innovations. This is a joint public and private sector fund to help Australia's home-grown innovations become successful businesses, and by extension create jobs and boost Australia's productivity. The fund comprises \$70 million in Australian Government funding, \$30 million revenue from CSIRO's WLAN programme, and \$100 million in private sector investment.

53 Mr Kosta Sinelnikov, Policy and Research Manager, AVCAL, *Committee Hansard*, 31 July 2018, p. 22.

54 Mr Yasser El-Ansary, Chief Executive, AVCAL, *Committee Hansard*, 31 July 2018, p. 22.

55 AVCAL, *Submission 11*, p. 9.

- 3.77 However, the fund only applies to professional investors and companies, not to retail or 'mum and dad' investors.
- 3.78 The Australian Government also provides funding to six Growth Centres under the Industry Growth Centre Initiative aimed at driving innovation, productivity and competitiveness. The initiative is industry-led by sector experts, as industry is best placed to drive cultural change and overcome barriers to innovation, productivity and growth.
- 3.79 Since this initiative was established in 2015, the Australian Government has committed over \$46 million to over 100 collaborative projects and leveraged \$63.2 million from industry and research partners. The Growth Centres have:
- engaged with over 25,000 firms, research organisations and industry associations...
 - helped over 150 Australian businesses secure contracts and grow export sales, and
 - connected many hundreds more to potential markets and supply chains, here and overseas.⁵⁶
- 3.80 On 4 December 2018, the Australian Government announced that it would extend funding for the six Growth Centres for a further two years.

Other Government support for science and innovation

- 3.81 The Office of Innovation Science Australia (ISA) developed a strategic plan for the Australian innovation, science and research system to 2030.
- 3.82 The *Australia 2030: Prosperity through Innovation* report made 30 recommendations in five key strategic areas: education; industry; government being a catalyst for innovation and a recognised global leader; improving the effectiveness and commercialisation of research and development; and culture and ambition.
- 3.83 The Australian Government supported, or supported in principle, 27 of the 30 recommendations.

56 The Hon Karen Andrews MP, the Minister for Industry, Science and Technology, 'Industry Growth Centre Showcase', *Speech*, 4 December 2018, <<https://www.minister.industry.gov.au/ministers/karenandrews/speeches/industry-growth-centres-showcase>>, accessed 20 November 2018.

- 3.84 The Australian Government's Australian Technology and Science Growth Plan, aims to provide infrastructure and support to develop Australia's competitiveness in the global markets. The plan included:
- \$41 million for growing the Australian space industry (part of a \$302 million space package, which included measures for satellite infrastructure).
 - \$20 million for SMEs Export Hubs program to take local businesses global.
 - \$20 million to support Australian innovation in Asia.
 - \$29.9 million to build Australia's Artificial Intelligence capability to support businesses and workers, including funding for CRC projects with a focus on AI, and a national framework to address standards and ethics for the use of this technology.
 - \$4.5 million to encourage more women to pursue education and careers in Science, Technology, Engineering and Mathematics (STEM).
 - To develop better data to track innovation in Australia, within existing resources.⁵⁷

Timing considerations

- 3.85 The Australian Small Business and Family Enterprise Ombudsman suggested that government programs need to better reflect the timing required to implement innovative ideas. It stated:

It can take years for SMEs to get innovative measures implemented (factoring in research, prototypes and testing). Yet most government programs that support innovation last 12, possibly, 18 months. Small businesses cannot afford to invest in innovation without certainty of long term economic policies.⁵⁸

57 DIIS, *Submission 24*, p. 11.

58 Australian Small Business and Family Enterprise Ombudsman, *Submission 30*, p. 1.

Additional factors affecting innovation

STEM skills

3.86 In addition to accessing capital, businesses undertaking R&D and pursuing innovation also require people with the right skillsets to create and develop the innovative ideas.

3.87 Finding workers with appropriate skills in the science, technology, engineering and mathematics (STEM) disciplines was identified by business as a challenge. DIIS stated that:

Businesses that innovate are twice as likely to use STEM skills, and 70 per cent of Australian employers identify STEM employees as the most innovative. However, research also shows the integration of STEM skills with other skills is key to success in a wide range of fields. The National Science Statement recognises that science is part of a broader research ecosystem and that both STEM and other skills are needed to support innovation and the translation of research into practical outcomes.⁵⁹

3.88 Consult Australia submitted that 'Australia's position as an innovative and highly skilled service industry leader has rapidly fallen',⁶⁰ while other nations are investing heavily in STEM. In particular, it noted that China and India are outperforming their western counterparts in the number of STEM graduates.

3.89 Consult Australia identified a significant constraint on its consulting companies has been at the mid-tier and senior executive level. It also submitted that the diminishing pool of engineering graduates has been a concern. It stated:

Imagine you've already got the gap at your senior level. You're able to recruit a certain level of graduates; however, if that pool diminishes, you will then get a smaller number again coming through into that mid-tier, senior level as they progress through their career. ...at a time when we've got enormous infrastructure projects to deliver, we really need to make sure that we've got a strong pipeline of skills coming through the system. Otherwise,

59 DIIS, *Submission 24*, p. 15.

60 Consult Australia, *Submission 31*, p. 7.

we have to rely on the short-term fix of immigration, temporary skills visas to bring skills in from overseas.⁶¹

- 3.90 DIIS noted that there is strong evidence that STEM skills are already in considerable demand and that this demand will increase in the future. It commented that STEM skills are ‘already nearly 50 per cent of the key skills that we need in industries right now’.⁶²
- 3.91 To help address this challenge, the Australian Government made an initial \$112 million investment over four years (2016-17 to 2019-20) under the NISA to increase participation in STEM studies.
- 3.92 The NISA Inspiring Australia initiative is aimed at increasing Australians’ engagement with science. The Inspiring Australia Science Engagement Programme, administered by DIIS, provides grants and prizes to eligible schools, organisations and individuals. It is scheduled for evaluation in 2018 to 2019.
- 3.93 The NISA includes a \$64 million allocation to fund early learning and school STEM initiatives.
- 3.94 While it is too early to see the impact of these programs on businesses accessing workers with these skills, DIIS advised that there has been a very strong uptake of the programs supported by the NISA. The strategies are about ‘building the pipeline’ for the medium to longer term.⁶³
- 3.95 In its NISA initiatives in relation to STEM, the Australian Government has also focused on encouraging female participation in these disciplines – an area where there has traditionally been gender inequality. The initiative comprises:
- The Women in STEM and Entrepreneurship Grants programme (\$8 million over four years and \$1 million ongoing thereafter) to support projects that boost the participation in STEM education and careers, including as entrepreneurs.
 - The expansion of the Science in Australia Gender Equity (SAGE) project (\$2 million) made available to all Australian publicly-funded research organisations to help increase the number of female researchers in the workforce and particularly in senior roles.

61 Mrs Nicola Grayson, Director, Policy and Government Relations, Consult Australia, *Committee Hansard*, 31 July 2018, pp. 27-28.

62 Mr David Wilson, Acting Head of Division, Science and Commercialisation Policy Division, DIIS, *Committee Hansard*, 7 August 2018, p. 11.

63 Mr David Wilson, Acting Head of Division, Science and Commercialisation Policy Division, DIIS, *Committee Hansard*, 7 August 2018, pp. 11-12.

- Support to establish a Male Champions of Change for STEM group (\$2 million) which challenges men in leadership positions to drive cultural change on gender equality issues in major Australian STEM-related organisations.⁶⁴

3.96 In the 2018-19 Budget, the Australian Government committed a further \$4.5 million to support gender equity in the sciences.

Digital capability

3.97 Chapter 6 discusses the importance of communications infrastructure, in particular the need for comprehensive mobile coverage and for fast and reliable broadband services, to enable Australian businesses to operate effectively and grow.

3.98 The committee heard that the National Broadband Network (NBN) has the potential to provide significant innovation opportunities to business across Australia. However, some groups expressed concern that the delays and disruptions to the NBN roll out were impeding businesses operations and their ability to pursue these innovative opportunities.

3.99 A NSW Business Chamber survey of businesses in the state found that:

...almost 40 per cent of respondents had to wait more than four weeks for their NBN service to be fully operational, with some businesses reporting no internet or phone during this period. This meant an inability to not only receive or process electronic payments but engage with customers effectively.⁶⁵

3.100 Despite the identified concerns, the NSW Business Chamber expressed support for the Australian Government's investment in the NBN. To address roll out concerns – including the perceived lack of accountability, responsibility and coordination between retailers – the NSW Business Chamber proposed a national broadband service guarantee that would require 'wholesalers, retail service providers and contractors and installers to work together to deliver agreed service standards', with a focus on ensuring reliability, quality and timely fault rectification.⁶⁶

3.101 Cost pressures are a major factor for businesses attempting to modernise their technology and compete in the digital age. In the retail space, there is an increasing preference for online shopping with some demographics,

64 DIIS, *Submission 24*, p. 16.

65 Mr Luke Aitken, Senior Manager, Policy, NSW Business Chamber, *Committee Hansard*, 31 July 2018, p. 36.

66 Mr Luke Aitken, Senior Manager, Policy, NSW Business Chamber, *Committee Hansard*, 31 July 2018, p. 36.

such as younger people, and consumers having high expectations for convenience and interconnectivity.

- 3.102 The Australian Retailers Association submitted that while Australian retailers are doing their best in adapting to challenges in the sector, in-house innovation will not be enough. It suggested that assistance is needed from all levels of government.⁶⁷

Reducing regulatory barriers

- 3.103 Regulatory barriers can impede investment in innovation. For example, Insurance Council of Australia members found the significant expenditure on regulatory compliance to be the greatest impediment to investment in innovation.
- 3.104 Regulatory sandboxes are an option for innovators to test business ideas and products, without fear of enforcement actions if they are found not to have complied with existing regulations.
- 3.105 The Public Interest Advocacy Centre noted that in Australia regulatory sandboxes are being used in NSW for fintech businesses. Internationally, specific innovative energy services sandboxes are being run by regulators in Great Britain and Singapore.⁶⁸
- 3.106 The RMIT Blockchain Innovation Hub suggested an alternative to regulatory sandboxes for experimentation would be by adopting the regulatory philosophy of 'permissionless innovation'. This would involve having less regulation to enable more business experimentation.
- 3.107 The RMIT Hub described this approach as allowing the innovation to occur and then, 'when you identify problems, you regulate or you add consumer protection afterward.'⁶⁹ When discussing Australia's regulatory approach to blockchain the RMIT Hub stated that:

...you can limit the damage [of business experimentation] so it's not sort of mom-and-pop type harm if that's what you're

67 Mr Russell Zimmerman, Executive Director, Australian Retailers Association, *Committee Hansard*, 1 August 2018, p. 16.

68 Public Interest Advocacy Centre, *Submission 6*, p. 4.

69 Dr Chris Berg, Senior Research Fellow, RMIT Blockchain Innovation Hub, School of Economics, Finance and Marketing, RMIT University, *Committee Hansard*, 17 October 2018, p. 23.

concerned about. But, more generally, Australia is competing in a global marketplace here.⁷⁰

- 3.108 In relation to developing blockchain technology, the RMIT Hub stressed the importance of signalling that Australia is making the regulatory changes to compete in the global market in this area.

Evaluating innovation policy outcomes

- 3.109 In recent years, governments at the Commonwealth and state levels have introduced a range of strategies and initiatives (including funds and grants) for innovation broadly, and more specifically in the medical technology and manufacturing sectors.
- 3.110 Given the significance of innovation for Australian business viability and wider economic growth, it is important that government innovation policies are efficient and having the intended effects.
- 3.111 While participation rates may demonstrate interest in a program, this is not enough to confirm that the program is effective and value for money.
- 3.112 CSL and Cochlear submitted that Australian Government innovation policies should include:
- ...a focus on consistency and clarity in programs and initiatives – ensuring there are clear objectives and KPIs for funds and grants and, that strategies and plans are implemented and reviewed.⁷¹
- 3.113 Innovation and Science Australia, in its *Australia 2030: Prosperity through Innovation* report, recommended that the Australian Government invest in developing a more effective framework to evaluate Australia's performance in the innovation race. This was proposed to include:
- Introducing a requirement that new government funding programs and policies aimed at supporting innovation dedicate approximately 2 per cent of their budget for the evaluation of outcomes that should be clearly identified in advance.
 - Tasking the Australian Government Department of Industry, Innovation and Science with developing a stronger longitudinal evidence base for program effectiveness, to improve the longevity of high-impact innovation programs, inform
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70 Dr Chris Berg, Senior Research Fellow, RMIT Blockchain Innovation Hub, School of Economics, Finance and Marketing, RMIT University, *Committee Hansard*, 17 October 2018, p. 23.

71 CSL and Cochlear, *Submission 13*, p. 12.

cessation of ineffective programs, and underpin iterative improvement of all programs.⁷²

- 3.114 The Australian Government supported this recommendation in principle and expressed its commitment to effective evaluation. It indicated that it would identify appropriate evaluation funding models, and in doing so will have regard to models used in comparable countries. Further, it stated:

The Government has robust frameworks in place that drive evaluation activities across government. For example, the Business Longitudinal Analysis Data Environment (BLADE), funded through the 2017–18 Budget measure, Data Integration Partnership for Australia, uses government-owned data to conduct robust program evaluations and inform the development of future innovation and industry policy.⁷³

Conclusions and recommendation

- 3.115 Innovation has an increasingly important part to play in Australia's economic growth. However, the committee heard that left to themselves businesses tend to underinvest in research and development (R&D). This illustrates why government engagement and well-targeted innovation policies are crucial to encourage Australian businesses to undertake R&D and to innovate.
- 3.116 In particular, translating innovative ideas into commercially viable business ventures is an area in which Australian businesses can benefit from strategic government support and funding.
- 3.117 This targeted approach will help ensure that as a nation Australia is getting a return on public spending on skilling people and generating innovative ideas, instead of losing people, ideas and innovative businesses to overseas opportunities.
- 3.118 Through direct funding and grants, tax measures and other enabling measures, the Australian Government is fostering an environment that supports businesses to innovate and grow.

72 Innovation and Science Australia, *Australia 2030: Prosperity through Innovation*, November 2017, p. 100.

73 Department of Industry, Innovation and Science, *Australian Government response to Innovation and Science Australia's Australia 2030: Prosperity through Innovation*, May 2018, p. 18.

- 3.119 The committee commends the Australian Government's, and state and territory governments', commitment to strategically supporting business and wider innovation to help ensure that Australia remains competitive.
- 3.120 The committee notes the effectiveness of the Australian Government and private sector \$501.25 million Biomedical Translation Fund (BTF) established to commercialise promising discoveries in that sector. The committee recognises that a similar scheme with broader application could similarly benefit other sectors in Australia to more effectively commercialise innovative ideas.
- 3.121 The committee noted evidence that the Australian Government's National Innovation and Science Agenda (NISA) has been an important catalyst in the country's innovative economy, and crucial in getting Australia 'back on track' to be able to compete in the global marketplace.
- 3.122 However, the committee shares concerns expressed by stakeholders in evidence to the inquiry that without continued targeted focus on science and innovation Australian businesses may not remain competitive.
- 3.123 As the four year NISA funding commitment nears the end in 2019, it is important for the Australian Government to recommit to this initiative and its funding going forward.

Recommendation 7

- 3.124 **The committee recommends that the Australian Government consider committing to the National Science and Innovation Agenda (NISA), and making provision from the 2019-2020 Budget to fund NISA initiatives for another four years.**
- 3.125 The committee also notes that in parallel to the NISA and broader innovation policies, the Australian Government should ensure that it has appropriate evaluation processes in place to assess whether these policies and specific initiatives are performing efficiently and effectively.
- 3.126 In addition to access to capital to fund innovation, businesses must also be able to access workers with the required skillsets. The committee notes that some groups expressed concern about not being able to find workers with the required professional skills. In particular, shortages in science, technology, engineering and mathematics (STEM) skillsets were raised.

- 3.127 Immigration is an important source for skilled labour. However, it is also important to grow Australia's own domestic capacity with targeted support for education in shortage areas such as in the STEM disciplines.
- 3.128 The committee notes that the Australian Government has introduced a range of initiatives to encourage Australians to engage in STEM disciplines. While the effects on increasing the STEM graduate pool will not be immediately evident, this is an important policy and funding commitment to enable businesses in the medium to longer term to draw on local talent to innovate and remain competitive.