

SUBMISSION TO THE UNIVERSITY RESEARCH COMMERCIALISATION CONSULTATION PAPER

April 2021

INTRODUCTION

Universities Australia welcomes the opportunity to make a submission to the *University Research Commercialisation* consultation.

Universities Australia is the peak body for Australia's 39 comprehensive universities. Our members are spread across Australia, in both regional and metropolitan areas. They educate more than a million students each year and undertake research that adds to Australia's stock of knowledge, and to Australia's economic and social wellbeing.

Australian universities are a key national resource. Unlike physical resources, they provide limitless potential through the generation of ideas, from discovery to applied research, that enables society and the economy to continuously improve. Universities also provide our graduates with the education and skills to navigate not just the challenges of the present but the unknowns of the future.

RECOMMENDATIONS

- Consider the strategic balance approach to investment articulated in Industry, Innovation and Science Australia's advice to Government.
- Adopt a nationally cohesive approach that leverages state-based R&D and innovation initiatives.
- Focus on demand-side incentives for business as it may be more effective in stimulating research commercialisation.
- Investigate the scaling and optimisation of the current Business Research and Innovation Initiative (BRII) program.
- Investigate the introduction of a Small Business Technology Transfer (STTR)-like program.
- Enhance the matching of R&D supply and demand in SMEs by introducing a technology vouchers scheme like that practiced in NSW.
- Mission-driven activity should be appropriately linked to demand, including existing and emerging Australian industry. Connecting mission-based activity to the Modern Manufacturing Strategy should be investigated.
- Investigate the introduction of a technology transfer network like the German *Steinbeis* system, in addition to conducting a scan of the system of Australian technology transfer.
- Reinstate the robust measurement by Government of research commercialisation across the entire research sector to provide accurate, quality data on a policy objective of this importance.
- Consider the impact of Australia's intellectual property framework on research commercialisation.

CONTEXT

Universities are fundamentally public good institutions. This includes their contribution to national prosperity through ensuring that the knowledge they generate effectively diffuses into the economy through the private sector.

Universities generate, by international standards, a substantial amount of research income that is funded by industry (4.9 per cent in 2018).¹ By comparison, the United States was 5.44 per cent.¹ The return on investment to industry of university R&D has been estimated at \$4.50 for every \$1 invested, amounting to \$12.8 billion in 2018-19.²

With the support of the Australian Government, universities have successfully developed a knowledge intensive services export that rivals Australia's goods exports (pre-pandemic). This has enabled not only the university but the national R&D system to grow. This is the basis from which universities have and will continue to contribute to commercialise research that boosts the nation's economy.

APPROACH

Universities Australia notes the recently released report from Industry, Innovation and Science Australia that recommends the adoption of a strategically balanced, whole-of-government innovation, science and research (ISR) investment plan.³ It defined strategic balance across several factors. Specifically:

- **phases and pipeline** – where investments are balanced between basic, applied and translational ISR and where ISR can move seamlessly along the innovation pipeline;
- **scale** – where ISR investments are appropriately scaled and funded to achieve meaningful impact;
- **risk** – where the risks of ISR investments are assessed, accepted and incorporated into the initial design and balanced across the investment portfolio;
- **investment mechanisms** – where investments are balanced between targeted and broad-based funding mechanisms; and
- **resourcing** – where ISR investments are balanced between the costs of research, researchers, administration, infrastructure and operating costs.

The report also recommended an implementation strategy that included:

- ensuring investment in basic research does not fall below current levels (22 per cent of overall R&D investment) so that it can underpin future commercial opportunities;
- improving research-industry collaborations and commercialisation by providing a suite of effective and coordinated programs of appropriate scale and scope to achieve outcomes, such as increasing the use of research commercialisation brokers and embedding of researchers within industry; and
- a progressive shift toward direct investment mechanisms to achieve targeted outcomes for business and higher education-performed ISR.

Universities Australia strongly supports these system design recommendations and encourages the Government to adopt them. Universities Australia also strongly supports the safeguarding of spending on basic research, given its role in underpinning the research system.

¹ OECD (2021). Main Science and Technology Indicators database. Accessed 29 March 2021.

² Universities Australia (2020), [Clever Collaborations](#).

³ Australian Government, Industry, Innovation and Science Australia (2021), *Driving Effective Government investment in innovation, science and research*.

In line with the approach above, Universities Australia also notes the major recent R&D investments and initiatives announced by the NSW and Victorian Governments. Any design should take these and other state initiatives into consideration.

The NSW, *Accelerating R&D in NSW Action Plan*, specifically calls for:

1. **Launch a Small Business Innovation Research (SBIR) program** – provide competitive grants for small and medium-sized enterprises (SMEs) to find and commercialise innovative solutions to well-defined problems for government agencies.
2. **Boost open data** – target the strategic release of new NSW Government datasets so that businesses can improve their decision-making; entrepreneurs can build new businesses; and the Government can solve complex challenges.
3. **Turbocharge precincts** – develop precincts to attract national and global technology industries and investment, and drive collaboration between universities, research organisations, start-ups, scale-ups and SMEs, to commercialise R&D.
4. **Target strategic support for NSW universities** – collaborate on research that drives future NSW strategic growth industries and research-led industry attraction, and better leverage commonwealth government research funding.
5. **Establish an R&D matchmaking platform** – better connect research ‘sellers’ and ‘buyers’ and link researchers to research infrastructure and expertise.

There are clear overlaps that should be leveraged.

POTENTIAL SOLUTIONS

Target demand-side incentives

Universities Australia encourages the Government to focus on demand-side incentives. Universities have substantial research capacity across all fields of research. Industry is best placed to understand the research services that it requires to commercialise its products; and conversely, it is also in the best position to identify the commercial potential of research that resides in the universities. A ‘supply-side’ push of research without the demand for it will not be effective.

The demand-side incentives outlined below will provide the support, infrastructure and skills, in particular for SMEs, to translate university research or to use university research effectively as an input into their processes.

Research commercialisation incentives

Universities have multiple incentive structures that recognise business-university collaboration, including the block grants and the Engagement and Impact exercise. The demand-side incentives outlined in this submission for business would be more effective in stimulating knowledge transfer between universities and business.

Mission-driven research

Mission-driven approaches are appropriate when adequately aligned to demand and emerging or existing industry capability. Universities Australia encourages aligning mission-driven activity with the Modern Manufacturing Strategy and other industry incentives to foster an effective pipeline of translation. International examples, such as the UK’s Industrial Strategy’s mission of becoming a world leader in ‘shaping the future of mobility’ – and corresponding partnerships between researchers and industry in efforts towards the Faraday Battery Challenge – demonstrate that clustering research and industry towards shared goals is an effective way of linking research with demand.

Establishing an effective program structure will be essential in creating a successful mission strategy. It will require appropriate, evidence-based and achievable goal setting (establishing targets to be reached, rather than setting *how* these challenges will be achieved). It is important that the balance of risk and engagement is appropriately aligned to the existing or emerging Australian industrial structure.

International examples of unsuccessful mission-driven challenges – for example, Scotland’s Saltire Prize directed towards advancing and commercialising wave and tidal technology – point to mismatches between an existing industrial and technology landscape where commercial capability was not sufficiently in place to carry forward corresponding research supply.

Launched in 2008, the Saltire Prize, with an ambitious £10 million mission to capitalise on Scotland’s extensive coastline for marine energy, saw its 2017 deadline pass without the prize ever being realised⁴. The mission’s failure has been seen as resulting from an ill-defined challenge that, alongside inappropriately ambitious criteria, failed to recognise that the marine energy industry landscape in Scotland was not sufficiently developed to capitalise on the mission’s goals.

Stimulating innovation and facilitating SME/university engagement: the SBIR and the STTR programs

The *University Research Commercialisation* consultation paper rightly highlights the US Small Business Innovation Research (SBIR) program as a great example of stimulating innovation. It is a longstanding program that has been recognised throughout the world as highly effective in stimulating commercialisation in SMEs, with multiple attempts around the world to emulate it.

The Department of Industry, Science, Energy and Resources currently administers the Business Research and Innovation Initiative (BRII) program, which is modelled on the SBIR. Whilst it is generally agreed to be successful, its scale is insufficient to achieve significant transformation.^{5,6} The pilot evaluation noted that if the program was to be scaled up, its design would need to be adjusted.

In terms of program design, the Technology Readiness Level based stage-gate process has been well-trying in the SBIR and there is good reason for optimism in its success, should the other program elements be effectively implemented in the Australian context.

However, the SBIR is focused more on achieving business innovation through de-risking by government than the transfer of knowledge between universities and business.

The complement to the SBIR in the US is the Small Business Technology Transfer (STTR) program. The STTR supports the commercialisation of technologies through providing a share of federal R&D funding to SMEs that have a formal collaboration with public and non-profit research institutes, including universities.⁷

Each year, US federal agencies with external R&D budgets that exceed \$1 billion are required to reserve 0.45 per cent of the extramural research budget for STTR awards to small businesses. These agencies designate R&D topics and accept proposals.

The program focuses explicitly on the transfer of technology from the research institutes to the SMEs. Whilst the grant applicant has to be the SME, the research institute must perform at least 30 per cent of the R&D. Furthermore, the principal investigator can be from either the SME or the research institute.

This is a key difference between the STTR and the SBIR.

⁴ M Bennett, ‘Whatever happened to the Saltire Prize?’, BBC, <https://www.bbc.com/news/uk-scotland-scotland-business-42832168>

⁵ BRII is currently funded at \$25.4 million over four years from FY2019-20 to FY2022-23. The pilot stage of the program received \$12 million between 2015-16 and 2018-19 following NISA.

⁶ 11 Feb 2020. InnovationAus. [Under-the-radar BRII program surfaces](#). Also see the [evaluation](#) of the BRII pilot program by Nous.

⁷ For more detail, refer to: <https://www.sbir.gov/about/about-sttr>

An equivalent Australian program would allow SMEs to overcome the risk and upfront expenses associated with R&D, and would allow universities to convert the investments made in basic and applied research into products and services to grow the economy through the SME. Thus, the program leverages the strengths of both entities.

Other notable examples include the SME directed Canadian R&D support programs – the Canada Industrial Research Assistance Program (a stage-gated program design); and the Canada Strategic Innovation Fund (incentives for industry).

Matching R&D supply and demand in SMEs – technology transfer vouchers

Innovation or technology transfer vouchers are an initiative that encourages collaboration between small and medium-sized enterprises (SMEs) and universities, thereby providing the SME with a greater opportunity to commercialise its products or services through access to skills and infrastructure it would not otherwise be able to afford. They address a well-known gap in the university-industry engagement space.

An example is the NSW TechVouchers scheme which awards up to \$15,000 to SMEs (matched by the SME). The SME is connected with an expert in the relevant fields of research, as well as receiving access to high tech instruments and facilities that would otherwise be prohibitive.

A Commonwealth vouchers scheme would provide a national basis for stimulating SME-university collaboration and driving productivity at a national scale. Universities Australia notes the use of innovation vouchers in the Industry Growth Centres Initiative.

Maximising person-to-person connections – connecting researchers and business

In the longer run, fostering people-to-people connections offers the potential for cultural change, which has the greatest chance of achieving lasting, transformative commercialisation and research translation outcomes.

Universities are geographically distributed and can act to diffuse innovation across the economy under the right conditions. In a 2018 speech, Andrew Haldane from the Bank of England emphasised the potential role of universities as diffusive agents of innovation across the economy.⁸

Another element noted in the same paper is the importance of the effective circulation of human capital in the economy. The example offered (that is lacking in the UK) is the German *Steinbeis* system.

Steinbeis operates as a transfer network, working to translate academic findings, specialised knowledge, and technology to industry application.

Over 1,000 decentralised *Steinbeis* transfer centres and institutes exist globally, primarily housed at German universities. They operate as stand-alone profit-generating entities, offering technology and expertise through a centralised network, and providing consulting, R&D, training and continuing professional development services.

A *Steinbeis* centre is currently operating in Victoria specialising in areas such as biotechnology; signal processing including robotics; and environmental research related to mining and exploration.⁹

There may be benefit in conducting a scan of the system of Australian technology transfer to identify any additional potential measures for introduction or scaling.

Universities Australia also notes that the Government's National Priorities and Industry Linkage Fund program will lead to an overall lift in the level of work integrated learning. Experience in programs such as the APRIntern program suggests that connections formed between the university and the business through

⁸ Speech by Andrew Haldane (28 June 2018), Chief Economist, Bank of England. The UK's productivity problem: hub no spokes.

⁹ For further details, refer to the Victorian Steinbeis centre [here](#).

the internship translate (at least at the postgraduate end of the skills pipeline) into additional collaboration between the university and the industry partner.

Targeting the global market

Universities Australia notes the review of the Export Market Development Grant program and the Government's acceptance of the recommendations. Access to the global market will enable SMEs to survive and thrive.

As universities produce goods and services that are often at the highest level of innovativeness (i.e. new to the world innovation), any program design should seek to streamline the interactions between universities/SMEs and the global market.

Measurement of research commercialisation

Historically, the National Survey of Research Commercialisation (NSRC) was the Government's main survey for measuring research commercialisation between 2000 and 2016, not only in universities but also Medical Research Institutes (MRIs) and Publicly Funded Research Organisations.

Universities Australia is concerned that the measurement of the commercialisation of publicly funded R&D worth many billions of dollars is now managed by a not-for-profit, membership-based organisation that has subcontracted it to a small private consulting firm. It is a precarious governance model and it also appears that the coverage and quality of the survey has declined from that of the NSRC.

Universities Australia encourages the Government to reinstate the measurement of research commercialisation across the entire research sector to provide accurate, quality data on a policy objective of this importance. The measurement approach should also be cognisant of the significant lag times in the research commercialisation process.

Australia's intellectual property framework

An effective regulatory and legal system provides the framework conditions for innovation to flourish. At present, copyright law in Australia is a barrier to research commercialisation. In 2013, the Australian Law Reform Commission recommended the introduction of the doctrine of fair use into the *Copyright Act 1968* with the intention of assisting innovation.¹⁰ Those recommendations have not been implemented despite overwhelming supporting evidence.

At present, Australian academics and students are restrained when they present their research in public or use it to collaborate with industry.¹¹ Research translation and by extension, research commercialisation relies on the effective flow of information.

By way of example, researchers may rely on a fair dealing for research and study to quote the work of their peers, but when their research is made public they must either seek permission or redact that content. This constraint places Australian researchers at a clear international disadvantage. Universities Australia encourages the Government to amend the intellectual property framework to better support research, innovation and university research commercialisation.

10 Australian Law Reform Commission (2 December 2013) *Copyright and the Digital Economy (ALRC Report 122)* at <https://www.alrc.gov.au/publication/copyright-and-the-digital-economy-alrc-report-122/4-the-case-for-fair-use/fair-use-assists-innovation/>

11 For more information see *Copyright in the Digital Age* (February 2018) Deloitte at <https://www2.deloitte.com/au/en/pages/economics/articles/copyright-digital-age-google.html>

CONCLUSION

Universities Australia welcomes the Government's recognition of universities as a key element of the research commercialisation and more broadly, the innovation system.

Whilst universities have a number of incentives to facilitate research translation, the demand-side incentives for industry could be further enhanced to assist with the commercialisation of the research, as recognised by the proposed programs in the consultation paper.

SME-university collaboration is a longstanding area of challenge and the programs presented for consideration and scaling should assist with this. Finally, the measurement of research commercialisation has unfortunately languished in the last several years. Universities Australia encourages the Government to urgently improve the current state of measurement.

Universities Australia would be pleased to work with Government on the details contained in the submission.