

SCIENCE & TECHNOLOGY AUSTRALIA POLICY SUBMISSION

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PRODUCTIVITY COMMISSION 5-YEAR PRODUCTIVITY INQUIRY INTERIM REPORT 3: INNOVATION FOR THE 98%

Science & Technology Australia is the peak body for the nation's science and technology sectors, representing 105 member organisations and more than 90,000 scientists and technologists. We connect science and technology with governments, business and the community to advance science's role in solving some of humanity's greatest challenges.

We thank the Productivity Commission for this opportunity to offer input on [Innovation for the 98%](#), the third interim report for its 5-Year Productivity Inquiry.

Innovation – and the ground-breaking transformative research that drives it – is the beating heart of a thriving economy. Indicators like the global [Economic Complexity Index](#), the [Harvard Atlas of Economic Complexity](#) and the [Global Innovation Index](#) show strong connections between robust R&D funding and economic complexity and innovation. Investment in R&D is money well spent.

Right now, the world is in a fierce science and technology race for economic advantage. Australia must maintain – and lift – investment in both public and private R&D to compete globally and boost our sovereign capability. We need to back our world-class researchers to keep pushing boundaries, and seek the frontier knowledge that will lead to the innovation needed to drive our economy and productivity.

Australia cannot afford to rely mostly on importing ideas from overseas – we need to be a nation that breeds creators of new knowledge and the innovation knowledge brings.

The living standards and opportunities of our children and grandchildren will rely on the investments we make now in the economy-transforming capabilities of breakthrough research.

If Australia doesn't keep pace with our economic rivals, we face the grave risk of consigning ourselves to be consumers rather than creators, eroding our sovereign capability in science and technology and making us more reliant on other nations amid seismic geopolitical shifts.

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DIFFUSION VS ACTIVE INVESTMENT IN RESEARCH AND DEVELOPMENT

The Productivity Commission notes there is a difference between novel innovation and ‘diffusion’. However the report’s almost exclusive focus on ‘diffusion’ fails to properly acknowledge the critical importance of transformative novel innovation and the importance to countries and their productivity performance of pursuing such ambitions with targeted research and development goals.

The commission observes: “Innovation at the frontier involves especially high-risk activities that often require scarce upfront capital, are penalised by the tax system and whose returns are diluted because other firms can adapt the ideas without paying for them.”

This highlights the importance of government investment in publicly funded research – the high risk, potentially high gain activities – innovation at the frontier – that private companies are not prepared to undertake.

Australia’s home-grown research capabilities are one of our economy’s superpowers. We cannot rely on a strategy of mostly importing innovation from abroad coupled with ‘diffusion’ to produce new ideas, new knowledge or create new breakthroughs.

Blue sky research is often incremental in nature, with each study or project building on work that has come before, collating and synthesising knowledge in new ways with new applications. In this respect, some elements of ‘diffusion’ are inherent in Australia’s research system, but the active pursuit of new knowledge cannot rely on simply absorbing ideas from elsewhere.

Strong, consistent and growing investment from governments in public research institutions is essential to build Australia’s sovereign capabilities in crucial research areas that will be needed to navigate challenges and threats – both domestic and global – in the coming decades.

To neglect or abandon publicly-funded research – the single most powerful driver of Australian innovation – and instead hope that imported global innovation will somehow ‘diffuse’ its way throughout our economy is, frankly, magical thinking.

A strategy of offshoring, combined with ‘trickle-down innovation’ is not a sensible innovation policy for Australia. It would be an absurd and incredibly short-sighted idea that would leave Australia poorer economically and robbed of its inventiveness and creativity. It would be a disastrous ‘own goal’ for our country’s productivity and economic growth.

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TAX SETTINGS

The report speaks of better supporting innovation ‘diffusion’ through supportive tax and regulatory settings. Science & Technology Australia supports tax incentives such as the Patent Box tax break announced in the 2021 Budget to boost commercialisation of research and innovation developed here in Australia.

The report contends ‘diffusion’ is businesses adopting incremental changes and progress towards best practice. Such activity should not be regarded as research and development, nor innovation. It is simply continuous business improvement – and should not attract tax incentives such as the Research & Development Tax Incentive.

UNIVERSITY RESEARCH COMMERCIALISATION

Public funding of research is an investment. The benefits of this investment flow throughout our economy and society in the many ways university research is translated into everyday benefits.

One of the many gains to the broader Australian community from strong public investment in research is realised when research findings move beyond the laboratory and into industry. Stronger research commercialisation has the potential to significantly boost productivity – spurring the economy through creating new jobs, start-ups and businesses.

We cannot rely on a strategy of ‘diffusion’ for this to happen. Greater progression of university research along the technology readiness level path requires concerted and directed effort.

SKILLED MIGRATION

Recommendation direction 2.1

Skilled migration as a means to diffuse technologies and skills

Skilled migrants have skills that are lacking in Australia, thanks to their experiences with frontier technologies and practices developed overseas. Facilitating skilled migration will remove barriers to the diffusion of those technologies and skills. An expanded and adapted employer-nominated migration scheme would allow better matching of the skills and knowledge needed by employees and the unique capabilities held by migrants.

Science & Technology Australia agrees with recommendation direction 2.1 on skilled migration.

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The success of Australia's science, technology, engineering and maths research sector relies on combining Australia's brilliant home-grown research talent with the best and brightest researchers from all around the world. In many specialist STEM fields, Australia needs to bring PhD students and post-doctoral researchers from overseas as the numbers of Australian students pursuing higher degrees in these crucial capabilities are nowhere near enough to support Australia's economy-powering frontier research.

Some 'diffusion' of ideas and knowledge is inherent in the migration of global research talent into Australia. However Australia's success also relies on global links forged between research institutions, and global collaborations. Ideas and knowledge are 'diffused' in those collaborations, but more importantly, new ideas and research findings are sought, with teams of researchers working in a concerted effort to push the boundaries of knowledge. This is the new knowledge that novel innovation relies upon, and is critical to securing Australia's capability for more sophisticated economic development.

Ensuring our visa systems help Australia to attract and retain talent is crucial to our economic future. The report suggests "An expanded and adapted employer-nominated migration scheme would allow better matching of the skills and knowledge needed by employees and the unique capabilities held by migrants". But it is essential to consider all the other visa classes that facilitate bringing talent to Australia. These include the student visa (subclass 500), post-study work visas (subclass 485) and the Global Talent visa (subclass 585). Policy settings for these visas must remain fit-for-purpose, and the applications and approvals processes must be properly resourced. This wider array of visas is also crucial to enable Australia to secure the world's best research and innovation talent to grow our economy.

Another aspect critical to Australia's STEM sector is to attract Australian STEM talent working overseas to return home, bringing their globally-acquired knowledge and expertise with them. To encourage our scientists and technologists to return to Australia, we need to improve job security in Australia's STEM sector. This is a multi-factor productivity challenge. It includes the productivity-sapping administrative burden of taking researchers away from their research constantly to write grant applications that run to hundreds of pages in some schemes (with very low success rates for grants). And it imposes a cruel state of insecurity and uncertainty by putting some of our best research talent on repeating cycles of precarious short-term employment contracts.

Delivering stronger job security in Australia's STEM sector by shifting to longer research grant terms, and requiring employers to offer longer-term contracts that reflect the full grant length, would help Australia to convince more of our brilliant Australian research talent to come back home and attract more of the rest of the world's best talent. It would be a gamechanger for Australian productivity.

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BUILDING A STRONG STEM PIPELINE

The report highlights the importance of a strong education and skills training system.

It proposes: “Increasing the attainment and quality of education, including early childhood education, schools, higher education and VET, increases workers’ capacity to identify and make productive use of new technologies and practices.” (p37)

Science & Technology Australia supports strengthening the STEM teaching workforce to ensure the next generation of scientists and technologists are well trained and have access to quality teachers with strong expertise.

However, the commission’s report later suggests Australia does not need to encourage the best and brightest to pursue a teaching profession – effectively contradicting its earlier recommendation. It states: “In teaching, for example, the appropriate aspiration may be to attract the good (and those best suited to the role) and to better use pedagogy, coaching and software to maximise their effectiveness as teachers.” (p76)

This sentiment is unwise and undermines the teaching profession. In a context where STEM teachers in particular are in short supply and concerns about the state of STEM education in our schools are growing, statements that effectively devalue the teaching profession are counterproductive and unhelpful.

Boosting Australia’s productivity and building our sovereign capabilities and wealth through innovation rely on a well-resourced and high-quality STEM research sector, underpinned by a strong STEM education pipeline. The importance of targeted funding and ambitious research goals cannot be understated. While it may be more appropriate in other areas of the economy, relying on ‘diffusion’ to enhance our research capabilities simply won’t cut it, and will leave Australia in a weak position to face the challenges of the coming decades.

Please do not hesitate to contact us if we can assist with any additional information.

Yours faithfully,

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