



Boosting the commercial returns from research

AIIA response to Discussion Paper

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About AIIA

The Australian Information Industry Association (AIIA) is the peak national body representing Australia's information technology and communications (ICT) industry. Since establishing 35 years ago, the AIIA has pursued activities aimed to stimulate and grow the ICT industry, to create a favourable business environment for our members and to contribute to the economic imperatives of our nation. *Our goal is to "create a world class information, communications and technology industry delivering productivity, innovation and leadership for Australia".*

We represent over 400 member organisations nationally including hardware, software, telecommunications, ICT service and professional services companies. Our membership includes global brands such as Apple, EMC, Google, HP, IBM, Intel, Microsoft, PWC, Deloitte, and Oracle; international companies including Telstra; national companies including Data#3, SMS Management and Technology, Technology One and Oakton Limited; and a large number of ICT SME's.

This submission

The AIIA appreciates the opportunity to provide this response to the Discussion paper *Boosting the commercial returns from research*, released by the Australian Government Department of Industry and the Australian Government Department of Education.

We support the objective of the review, which is to investigate how to improve the translation of research into commercial outcomes, as a key component in the government's innovation and competitiveness agenda.

This submission provides AIIA views on:

- The important role that innovation, and commercialisation specifically, plays in driving productivity, growth and competitiveness,
- Our views on the key success factors for commercialisation, and current impediments, with a focus on the IT sector,
- Critical actions for industry, government and the research sector in Australia to boost commercial returns from research.



Innovation is essential for long term economic growth

The Australian economy is entering a critical phase, with a number of 'disruptive' trends and pressures which provide both opportunities and risks for Australian business. The resources boom has had a significant impact on the structure of the Australian economy. The rapid increase in global demand for commodities, and the corresponding strong growth in commodity prices, placed the Australian resources sector in an enviable position. Growth in exports, both in volume and value, led to historically high terms of trade and exchange rate.

A critical outcome of the resources boom has been the impact on productivity. Australia's productivity growth - the envy of the developed world in the 1990s - has slowed dramatically in the last decade (primarily due to significant falls in mining and agriculture productivity). While increasing terms of trade has, so far, sustained incomes, despite slower productivity growth, this is not sustainable.

To sustain the level of prosperity Australia has enjoyed (and expects) productivity growth is imperative. However, this is only possible if we remain, indeed improve, our global competitiveness. In the current global digital economy this translates to both the ability to participate and effectively compete in the global market as well as the ability to compete locally to retain skilled employees and domestic customers. While greater investment in 'inputs' can provide shorter term growth in national income over the longer term innovation is the primary driver of sustained higher economic growth and living standards.

The benefits of innovation encompass direct benefits to innovative firms and consumers and social benefits through knowledge spillovers. Spillovers are benefits which are not directly captured by the innovator. They arise where ideas and concepts from innovation are mimicked or adapted in further innovation. Spillovers from innovation provide a multiplier effect across the economy, and are the primary rationale for government funding support for research, particularly basic research.

Pathways to realising commercial returns from research

The application of research outcomes is necessary for us to realise these gains from innovation. This may be through a new product, new process or new service, or it may be by incremental improvements over time which deliver efficiency gains. Commercial returns are not entirely captured by private firms - they deliver broader gains through employment, higher incomes, improved products and services for consumers, and flow on applications which often can't be foreseen. AllIA therefore supports the intention of government to seek improved pathways for commercialisation of research.

In our review of the discussion paper, an omission from the discussion was recognition of the different ways in which commercial returns from research can occur. Commercial returns can be considered in relation to:

- The application of particular research findings or outcomes in existing business practices, where incremental changes can improve productivity within existing practices, or can provide alternative approaches (for instance, a new service or product)
- 'Start-up' or 'Spin off' companies emerging with new products or services as a direct result of research breakthroughs - these are typically the most 'disruptive' technologies or applications.

Boosting commercial returns from research in this first case - within existing sectors and firms, is a very different task to improving the environment for start-up and spin-off firms. It is important for government to recognise these different pathways to commercial returns. This submission provides further discussion on entrepreneurship and start-ups in the ICT sector.



Success factors for improving commercial returns from research in Australia

While it is well recognised that innovation drives growth, translating knowledge and ideas into applications within the economy is not a simple process. ‘Basic’, or non-applied research conducted in universities and publicly funded research institutions can have a broad range of commercial applications, however there needs to be the appropriate structures in place to make these potential applications a reality (and, in turn, to realise the broader benefits of these applications, such as those spillovers discussed above).

This submission identifies four key success factors for improving commercialisation of research in Australia.

- **Collaboration** needs to be increased, primarily by aligning incentives and removing cultural barriers.
- **Research Infrastructure** needs to enable research excellence and be accessible for researchers across both the public and private sectors.
- **Funding** needs to be accessible at the most critical points during the commercialisation process.
- **Regulatory and policy settings** need ensure the best possible conditions for collaboration and entrepreneurship, and not present barriers (such as regulatory ‘red tape’) which discourage commercialisation.

Collaboration

Collaboration is critical for effective commercialisation of research. Translating ideas and knowledge into applications, products and services requires researchers and business to work together.

While at one level Australia simply lacks an appropriate supporting collaborative infrastructure, at another, incentive arrangements for some publically funded research organisations actively mitigates against collaboration.

We agree with the premise put forward in the discussion paper that researchers and business incentives are misaligned, and that this is a barrier to commercial returns being realised. The current system incentivises universities to focus on research publications rather than commercial applications. Current practices ‘lock’ intellectual property in universities (noting some improvements in this area). Similarly, the business environment can hamper research collaboration - short business planning cycles and risk aversion can limit the extent to which business seek research collaboration opportunities. Business, understandably, are primarily focused on their own commercial strategy, therefore research opportunities need to be appropriately targeted to engage business properly. This misalignment - with researchers focusing on research excellence and business focusing on commercial outcomes, can lead to many missed opportunities.

The lack of well-structured or permanent information sources available to participants in the innovation system combined with the absence of innovation precincts - physical hubs that provide a focal point to bring together the relationships and resources they need to innovate - are symptomatic of the bigger issue in an innovation system that lacks formal and effective collaboration frameworks.¹

AIIA strongly believes that technology can facilitate greater collaboration. It can reduce the costs of collaboration, in particular for geographically dispersed

¹ <http://www.microsoft.com/enterprise/en-au/business-leaders/joined-up-innovation/default.aspx#fbid=XUZGQJKwVP9>



partners. There are also numerous planning and collaboration tools available which greatly reduce the time costs associated with maintaining collaborative partnerships.

Research infrastructure

Commercial returns are maximised where the underlying research is of the highest quality. The Discussion Paper rightly identifies key indicators of research excellence in Australia, however we can improve investment in *research infrastructure* for basic as well as applied and experimental research. While the latter is typically undertaken by industry, nearly 80 per cent of ‘basic’ research done in Australia is through Australia’s public research capacity.² ‘Basic’ research encompasses broad economic, social, environmental and cultural benefits derived by Australia as a whole. It generally requires long lead times, is characterised by delayed returns and uncontrollable spillovers and has no clear path for commercialisation. For these reasons it is historically been the focus of public rather than private investment.

Recent funding cuts to two of Australia’s premier public research institutions - CSIRO and NICTA, signals therefore, a potentially serious erosion of Australia’s future research infrastructure capability.

Funding cuts and policies premised on the assumption that the market will drive basic, core research are, in our view, flawed. There are no economies in the world where such fundamental, pure research is undertaken by commercial entities. While companies will pay for research to solve their own problems, the cost of the underlying research infrastructure - the research platforms, skills (PhD students), industry cluster centres, pilot trials of new research, and associated activities that are integral to R&D, must be funded on a sustainable basis - typically by government over the long term. Only governments have the incentive and capacity to invest in core research that benefits the economy as a whole.

In the case of NICTA, its unique feature as a publically funded research model is its role to explicitly connect leading university researchers to industry/business. Basic research ‘discovered’ by NICTA is applied to real business problems and in the process, the next generation of skilled ICT researchers are embedded across industry and typically, multiple industry sectors. With 22 university partners and some 300 PhD students, the NICTA model has fostered the integral role of ICT in transforming individual companies and the economy overall. NICTA’s research is being translated into tangible economic benefits of up to \$2 billion per annum for a wide range of industries such as mining, logistics and transport, finance, health and government.³

As evidenced by the success of NICTA and confirmed by the Government itself (in its Policy for E-Government and the Digital Economy and as articulated recently by Paul Fletcher)⁴ the role of technology in Australia’s innovation system is critical. Technology is more than an input to the rapid change we are experiencing. In disrupting business models and driving advancements and innovation in products and services, technology and digitisation are core to future innovation.

² Powering ideas. An Innovation Agenda for the 21st Century. Australian Government, 2009

³ Deloitte Access Economics, National ICT Australia: Benefits from NICTA’s research to the Australian economy, 15 June 2012

⁴ See Paul Fletcher’s speech of 22 July 2014 ⁴ <http://www.paulfletcher.com.au/speeches/other-speeches/item/1101-speech-to-the-centre-for-independent-studies-our-national-competitiveness-and-where-the-digital-economy-fits-in.html> and the Coalition’s Policy for e-government and the Digital economy. <http://lpaweb-static.s3.amazonaws.com/Coalition%27s%20Policy%20for%20E-Government%20and%20the%20Digital%20Economy.pdf>



Entrepreneurialism

Entrepreneurialism is a critical driver of research commercialisation. To be entrepreneurial is to take innovation to the next stage - to have the drive to achieve commercial outcomes and to think innovatively within a commercial context.

Entrepreneurial businesses account for over half of all employment in most G20 countries.⁵ They spur innovation through the development of new technologies, products, services, processes and business models. They spread new ideas, inspire better ways to do things, are prepared to take risks, solve problems and are motivated and skilled to drive change. Fostering entrepreneurship - a skill that can be learned - is also key to an effective innovation system.

In the case of digital innovation and entrepreneurship, evidence shows a direct correlation to increased business opportunities, economic growth and job creation. With the right support it is estimated that *“the Australian tech startup sector has the potential to contribute \$109 billion or 4% of GDP to the Australian economy and 540,000 jobs by 2033 with a concerted effort from entrepreneurs, educators, the government and corporate Australian”*.⁶ Recent analysis shows that entrepreneurs supplied 57% of all jobs in the EU in 2012⁷ and 75% in China⁸ while in the US start-ups and companies less than five years old account for nearly all net job creation in the last three decades⁹.

In his recent speech to the Centre for Independent Studies¹⁰, Parliamentary Secretary to the Minister for Communications, Paul Fletcher specifically highlighted the role of startups in job creation and further, the disproportionate role of the high tech sector in generating startup companies. Citing the report from America’s Kauffman Foundation, he reported that new business formation was 23% more likely in the high tech sector of the US economy than in the private sector as a whole. According to Fletcher the report also found that new and young firms in the high-tech sector are more robust job-creators than such firms in the broader economy.¹¹

Notwithstanding that repeat entrepreneurs who have failed once before have been shown to have a higher chance of success than those trying for the first time¹², Australia’s tolerance for business risk and failure is low. The low acceptance of business failures means potential innovators are often reluctant to launch new ventures for fear of harming their reputation.¹³ It is also reflected in the reluctance of talented people to transfer from the tertiary education sector to private sector organisations - the perception that it is a failure to go from research in university to business.¹⁴

Technology and digitisation have contributed to building entrepreneurial capabilities by facilitating easier access to knowledge for innovators; expanding markets for entrepreneurs; facilitating invention; and enabling linkages between stakeholders across domestic and global innovation systems. Although implicit in most of what we do, Australia’s innovation system of the future must explicitly commit to leveraging high end and emerging new technology to underpin future innovation capability.

⁵ The Power of Three. Together, governments, entrepreneurs and corporations can spur growth across the G20. EY. 2013

⁶ PwC Consulting, (2013) The Startup economy. How to support tech starts and accelerate Australian innovation.

⁷ Ecorys, EU SMEs in 2012: at the crossroads. Annual report on small and medium sized enterprises in the EU, 2011/12 p.15

⁸ “China Country Profile: small and medium sized enterprise,” Ministry of Commerce Peoples Republic of China website, 3 July 2013

⁹ D Stangler and P Kedrosky, Neutralism and Entrepreneurship: The Structural Dynamics of Startups, Young Firms and Job Creation. 2010.p 13.

¹⁰ <http://www.paulfletcher.com.au/speeches/other-speeches/item/1101-speech-to-the-centre-for-independent-studies-our-national-competitiveness-and-where-the-digital-economy-fits-in.html>

¹¹ Ibid.

¹² P A Gompers et al., “Performance Persistence in Entrepreneurship and Venture Capital”, Journal of Financial Economics. Vol 96. No.1 2010

¹³ <http://www.microsoft.com/enterprise/en-au/business-leaders/joined-up-innovation/default.aspx#fbid=XUZGQJKwVP9>

¹⁴ Ibid.

Funding

Entrepreneurs need an environment that is conducive to investment in activities that drive new ventures, new products and services and new jobs. Australia has one of the lowest rates of venture capital investment in the developed world. According to the 2013-14 World Economic Forum Global Competitiveness Report Australia ranks 19th in the availability of venture capital - well behind the US, Singapore, Malaysia, Norway, Sweden, Israel and China.¹⁵

On a per capita basis venture capital investments in start-ups in Australia is currently US\$4.7 per capita per annum. This compares to US\$170 in Israel, US\$85 in the United States, US\$20 in South Korea, US\$15 in the UK and US\$5 in New Zealand.¹⁶ In 2013 sources for new venture capital reduced by \$2.4 billion, or 77%.¹⁷

With limited venture capital and private equity funding opportunities many Australian start-ups and entrepreneurs struggle because they cannot access essential financial support. Lack of access to 'affordable' capital - at reasonable rates and on reasonable terms - is one of the most significant market failures in the Australian start-up ecosystem.

To support an effective innovation ecosystem, Australia needs to develop more innovative funding platforms. These include crowdfunding, microfinance, targeted venture capital funds and incentives for private sector investors to focus more on innovative and entrepreneurial businesses.

Regulation and Policy

Countries with a strong innovation performance typically demonstrate the value of a supportive policy, regulatory and institutional environment. Policies designed to incentivise innovation and support early stage and more established entrepreneurial ventures provide a critical underpinning in an effective innovation ecosystem. This includes, for example, appropriate tax relief for investment and risk taking, simplifying rules to help companies raise equity and debt capital, reducing the administrative burden of tax, regulation and reporting requirements; improving the accessibility and transparency of regulatory arrangements; and streamlining compliance requirements.

The fundamental failure of our current innovation policy and regulatory environment, particularly when compared with some of our global competitors continues to play out as local technology companies move their operations overseas, principally to locations where they can access more favourable tax treatment to grow their business and/or where the tolerance for business and investment risk is higher.¹⁸ The difficulty Australian start ups and even later stage companies have in matching the equity and option offerings of tech firms overseas was highlighted by Paul Fletcher himself in his recent speech to the Centre for Independent Studies.¹⁹

By way of further example, while countries around the world are moving to expand their investment in R&D, Australia's R&D tax incentive requirements continue to be 'narrowed'. Legislation that disallows ICT related R&D in specific circumstances reinforces industry concern that the role of ICT in driving innovation and growth is poorly understood. The 'Internal Administration' exclusion in the R&D tax legislation²⁰, can be read to imply that any ICT R&D undertaken by a company for its internal use - including where it is undertaking ICT related R&D to improve delivery of its services to customers - is ineligible for the tax incentive.

¹⁵ http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2013-14.pdf

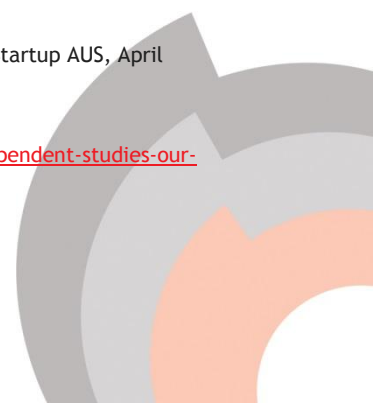
¹⁶ Referenced in Crossroads. An action plan to develop a vibrant tech start up ecosystem in Australia, Startup AUS, April 2014. P48

¹⁷ Reported Computer Daily News, 14 February 2014

¹⁸ Australian Financial Review, Wednesday 8 January 2014, p1

¹⁹ <http://www.paulfletcher.com.au/speeches/other-speeches/item/1101-speech-to-the-centre-for-independent-studies-our-national-competitiveness-and-where-the-digital-economy-fits-in.html>

²⁰ Section 355-25 of the Income Tax Assessment Act 1997



Actions to boost commercial returns from research

In support of our proposition that sustained innovation is most effectively enabled by a system comprising the interconnection of the themes outlined above, AIIA makes the following recommendations in support of the future of competitive innovation in Australia.

Collaboration

Recognising the critical role of collaboration (at all levels) to drive high performance innovation outcomes, AIIA recommends:

Priorities:

- Establish cross disciplinary and cross sector collaborative models such as the UK Catapult program to facilitate increased collaboration between researchers and business.
- Universities are incentivised to collaborate with industry to develop the commercial potential of their research.
 - This requires reassessment of performance based block funding arrangements under the Excellence in Research in Australia (ERA) program to rebalance the current focus on producing published research papers as opposed to applied outcomes.
- Establish a national register of intellectual property (IP) for Australian Government funded research institutions to speed up the commercialisation process. IP could be charged (or not) at different charge rates.
 - Where IP from university based research is not used within a specified timeframe that IP is made commercially available.
- Develop a mechanism that supports small and medium sized businesses contract with universities to provide stronger research capacity to their projects.
- Leverage smart digital technology to drive the creation, diffusion and application of knowledge.

Research Infrastructure

To ensure Australia's innovation system is supported by the infrastructure and knowledge required to drive effective innovation outcomes, AIIA recommends:

Priorities:

- The differentiated role of publically funded research to Australia's innovation system is recognised and better leveraged through a new model of engagement between universities and industry. AIIA recommends consideration of the UK Catapult program²¹ which provides a physical hub to connect business, researchers and academics to stimulate innovation and support the innovation lifecycle. AIIA strongly encourages the Government to build on the now mature capability of NICTA to support and guide such a model.

²¹ <https://www.catapult.org.uk/documents/2155693/2268412/What+is+a+Catapult/e68c7c90-39e0-45b7-be4b-9ba1e1c51232?version=1.2>



- Availability of and access to high end technology developments and ubiquitous high speed broadband. Technology is a crucial enabler and platform for innovation across all industry sectors. Government needs to foster technology as a platform for innovation by supporting the open, free, decentralised and dynamic nature of the Internet

Funding

To assist innovators and entrepreneurs access the capital they need to fund innovation and to appropriately recognise and support investors AIIA recommends:

Priorities:

- Develop innovative funding platforms such as crowdfunding and microfinance as a means to encourage increased private investment.
- Tax relief for investors in innovative start-ups and high growth companies. This includes relief in the form of tax credits or a reduced rate of tax in the first instances and/or relief in the form of capital gains tax reductions or exemptions for qualifying venture investments.
- A government innovation fund to source new products, services and solutions from small business to support the development of solutions for government. The U.S. Small Business Innovation Research (SBIR) program is an example of such a model.²²

Entrepreneurship

To drive a culture of entrepreneurship AIIA recommends:

Priority:

- Develop an entrepreneur scholarship program targeted at young people. In addition to providing financial support for young entrepreneurs to access relevant support programs and/or provide them some financial support while they focus on their idea, the program legitimises a career focus on entrepreneurship.
- Showcasing success. This includes businesses showcasing success and emphasizing the benefits of entrepreneurship including job creation and broader social and economic impacts.

Regulation and Policy

Policy and regulatory frameworks that facilitate and support innovation are essential. A number of existing impediments need to be addressed and more flexible policy design that supports innovation and entrepreneurial ventures.

Priorities:

- Develop a whole of government approach to innovation policy with a focus on mechanisms that coordinate policies and activities across agencies.
- Introduce innovative funding platforms such as crowdfunding and microfinance. This includes a review of existing legislative arrangements including current prospectus requirements, ability to advertise fund/investment raising activities and support for p2p debt crowd funding from non-sophisticated investors.
- Reform government procurement processes to facilitate increased take-up of innovative solutions offered by small and medium sized business - typically the result of commercially based research activities. Government can play a key role in driving innovation and developing

²² <http://www.sbir.gov/>



innovative skills by using its purchasing power to engage with and ‘invest in’ companies with innovative solutions and capabilities. This also facilitates the maturity and growth of businesses and strengthens innovative supply chains.

- Reduce the administrative burden of tax, regulation and compliance.
 - Simplifying tax codes, creating convenient, accessible online tools that help entrepreneurs and innovators navigate regulatory requirements and simplified rules to help companies understand and raise equity and debt capital smooth the innovation to commercialisation pathway. This includes streamlining ways for business to deal with all levels of government.

