

Boosting the Commercial Returns from Research

Submission by Curtin University, November 2014

Curtin University welcomes the opportunity to provide feedback on the recently released '*Boosting the Commercial Returns from Research*' paper.

The University strongly endorses the objective of the government to improve Australia's economic performance through better translation of research into commercial outcomes as part of the Industry Innovation and Competitiveness Agenda. We acknowledge that the higher education sector has a critical role in delivering this objective.

Research Excellence

Curtin University recognises that assessing research excellence has been an important driver in improving the quality of research in Australia. We also highlight that the current ERA model and its influence on resource allocation has driven universities and researchers to direct their research efforts towards more fundamental publication focussed research, in some cases at the expense of more applied research activity that involves integration of effort with business and industry.

Curtin as part of the Australian Technology Network of universities has been advocating for a more balanced approach to assessing research quality, through encouragement of the Australian Government to include impact related measurements in research assessment. Such a view will encourage and reward a more balanced approach to research in universities, ensuring closer engagement with Industry.

Curtin University also highlights the importance of high quality research infrastructure in developing, attracting and retaining internationally competitive research capability. Programs such as NCRIS and LIEF are critical in developing applied research outcomes and need to be fostered. Importantly, such programs need to have longer term commitments to ensure human capital continues to be developed and that there is increasing certainty around co-investment by industry and research providers that will ensure achievement of strong mutual benefit. These infrastructure programs also needs to take into account the funding of the specialist staff to maintain and optimise the use of the infrastructure.

Targeted Research & Prioritisation

Curtin University recognises the importance of building critical mass in areas of competitive advantage and focussing investment in these areas. It is however cautious that this does not reduce the ability of future significant areas of capability to be developed. One such area at Curtin University is Radio Astronomy. From a base of one researcher in 2005, the University now has a group of over 50 with a major stake in the global SKA project which includes a strong industry pre-construction program.

Curtin University along with CSIRO and key industry partners have been developing focussed engagement in Resources (Geoscience and Energy) in Western Australia to maximise productivity and use of resources. The National Resource Science Precinct (NRSP) encourages co-investment in research capacity and infrastructure and is now moving to develop strong industry engagement in identifying research priorities. Federal and State investment in the Pawsey Supercomputing Centre is also encouraging strong investment by both university and industry sectors and development of new capabilities such as computational geoscience.

The University also notes the recent priorities identified as part of the Industry Innovation and Competitiveness Agenda, and encourages the government to consider other emerging priority areas. One example is the cross cutting ICT capability needed across the identified priorities; namely data analytics and in some cases 'Big Data'. Curtin is working closely with a range of industry, government and research providers to develop an Exascale Data Alliance that will provide research translation opportunities for industry as a result of the significant investment made by these sectors in the Square Kilometre Array (SKA) project. Such an alliance will provide a clear gateway for industry engagement, development of new business opportunities and creation of new human capital and a national competitive advantage.

All of these focussed developments have come about from substantial university investment in advance of contributions from industry partners. The concept of a research and innovation ecosystem that takes time, effort and resources to develop and mature remains important.

Finally, the significant commitment to medical research is welcomed and particularly the focus on translation of research into clinical practise. Curtin University encourages consideration of development of similar opportunities in areas of existing and emerging competitive advantage such as minerals and energy (existing), marine sciences (existing) and data analytics (emerging). Such opportunities should be developed in partnership with industry to ensure that the research is applied in focus.

Cooperation between Research & Industry

Curtin University recognises the importance of creating a stronger relationship with industry in order to improve national productivity and competitiveness. Recognition of the varying timelines and objectives applicable to industry and universities is important in terms of developing an environment for investment in research, and providing incentives for collaboration and commercialisation are essential. Physical facilities are important, however operational and maintenance support are essential ingredients.

Development of innovation precincts with strong coordination and physical colocation of industry and research providers and development of a critical mass of research infrastructure have been shown elsewhere to increase innovation and collaboration.

The University also believes there needs to be effective governance models and incentives to unlock the opportunities that exist for universities and industry to increase innovation and productivity.

Cooperative Research Centres, ARC Linkage Grants and the newly established Industry Growth Centres program offer a suite of programs that will attract a range of industry participants. They all will however benefit from more streamlined models of engagement, creation of a gateway for industry and research providers to share problems and solutions, and relevant tax incentives for investment by Industry in research.

Recognition of industry sub-sectors remains a priority for Curtin University. Curtin is well placed in terms of working with the majors in the resources area, however it is also clear that resource service companies are essential drivers of resources productivity and have a strong need for research and innovation. The overheads of working with a larger number of smaller industry partners should be considered within innovation models.

Curtin University also agrees that improving the ability of researchers and research students to move between industry and universities over the course of their careers will increase Australian business productivity. Schemes that encourage researchers and research students to seamlessly move between industry and universities would be welcomed and suggest that industry and university incentives and better recognition of applied research and research impact will encourage this movement.

Entrepreneurship

Curtin University has a significant history of commercialisation of research having ‘spun out’ 18 companies since 2004. This includes companies such as Scanalyse, HiSeis, iCetana, Renergi, Sensear and Skrydata across mining services, geoscience, ICT energy, health and data analytics. The commercialisation program at Curtin includes a commercialisation investment fund and associated Commercialisation Advisory Board with industry and venture capital representation , a range of incentive programs, flexible IP management and profit sharing incentives. A comprehensive summary of successful technology drivers developed as a result of these programs is attached **(Appendix A)**.

28 November 2014

APPENDIX A

Drivers of successful technology transfer

Motivated innovators

- Currently there are not strong incentives in place for public sector researchers to undertake technology transfer activities. Many public sector institutions share commercial returns directly with employees and bear the early stage risk in commercial ventures by meeting costs around early stage commercialisation activities including IP protection. However, returns can often be modest and long development timelines mean that it can be 5-10 years before they are realised. Incorporating some measure of research impact into research quality assessment frameworks is one mechanism to drive behaviour. The aim should be to encourage academic staff to disclose and exploit their innovations. Measures such as new invention disclosures, levels of funding received from industry and commercialisation income received are potential categories. In many instances, the return to the public sector institution is not a good measure of impact. Significantly greater benefits can accrue to the parties adopting and using the technology developed. Measures such as revenue generated from sales, jobs created in start-ups and third party venture funding attracted can be used as measures of impact external to the technology developer. Increasing the importance of successful commercialisation outcomes in academic promotions and grant schemes would also provide greater incentive for researcher engagement in this area.
- Share option schemes are a well known incentive mechanism. The current regulatory environment in Australia around options does not facilitate the effective use of options as a motivator of technology entrepreneurship. Changes are currently being contemplated and encouraged. Ideally, the changes will ensure that option holders will be able to take full advantage of capital gains tax discount arrangements as well as a deferred taxing point. See <http://www.hmrc.gov.uk/manuals/essum/ESSUM50000.htm> for arrangements in place in the UK. It would also be useful to have a mechanism to reduce the burden of generating an external valuation required to price the options effectively. There is guidance on this in the UK system see <https://www.gov.uk/government/publications/hmrc-shares-and-assets-valuations-sav/hmrc-shares-and-assets-valuations-sav>
- National award schemes that celebrate and promote successful technology transfer have a role to play. The Clunies Ross Awards are an example of an awards scheme targeted at this area. The size and stature of these types of awards should be supported. The removal of a commercialisation award from the national Eureka Awards was a backward step in this regard. The announcement by the Prime Minister of the Prime Minister's Prize for the Commercial Application of Science is noted and supported.

Proof of concept funding

- Prototyping, commercial proof of concept, pilot trialling and business concept development can be required to package a technology into a form attractive to industry and investors. This is a high risk end of the investment market and historical returns provide little incentive to new entrants. Programs such Commercialisation Australia (and its predecessors) and the Innovation Investment Fund contributed towards filling the void of funding in this area. Continual program changes and low levels of funding commitment limit the effectiveness of these programs.
- Some Universities have recognised the gap in funding and established arrangements to make direct investments in this area. Appropriate incentives to encourage this behaviour could be considered such as matched funding. The Kiwinet model in place in New Zealand appears to be achieving success with this type of approach. Kiwinet is a collaboration between NZ Universities. Seed funding for commercial opportunities is provided by the NZ Government and is matched by



the Universities and private sources. The model encourages collaboration and knowledge sharing between institutions and standardisation of commercialisation processes. It has the benefits of building skills and critical mass in commercialisation as well as directly supporting projects with commercial potential <https://www.kiwinet.org/> .

- Follow on funding programs such as those used in the UK by the EPSRC and BBSRC may also be worthy of consideration. Under these programs, additional funds can be allocated to successful projects to improve their commercial appeal and potential for impact

Experienced entrepreneurs

- Accessing the right people to guide the direction or an opportunity at an early stage can mean the difference between success and failure. Australia does not have a large pool of experienced entrepreneurs who have successfully built technology based businesses. There are many Australians working overseas in technology sectors and some return home for personal reasons. Developing and supporting networks, such as *Advance*, to make it easier to identify those who are in the market or interested in return could improve access.

Industry experts and corporate customers

- Access to those embedded in a particular market domain can provide valuable insights as to the likely interest in a new technology based product or services. How significant is the problem being addressed to the sector? What competitive solutions exist? What are the barriers to entry in a particular market are all questions that can be addressed by industry experts and provide valuable guidance for those developing new products and services. Networks that enable access to these experts are of value. The Entrepreneurs Infrastructure Program is considering mechanisms to develop and provide access to better networks and this should be made available to public sector research groups as well as SME's
- Lean start up guru, Steve Blank is quoted as saying that no business plan survives first contact with customers. Mechanisms to encourage corporates to work with early stage technology providers and help hone the development of new technologies is of significant benefit. Programs such as ARC Linkage Grants have a role here. However, the limited application window and timeframes for accessing these grants are a problem. Reducing hurdles to accessing this type of funding would be of benefit
- Open innovation platforms are a good mechanism for focussing activities of researchers around areas of interest to industry. Companies publishing areas of interest for in-sourcing technology is one way to do this. The pharmaceutical industry has a very sophisticated approach to this that could be used as a model in other industries
- There are limited forums for industry to engage closely with public sector researchers. Targeted partnering initiatives that bring together technology developers with relevant industry groups should be supported. Knowledge Commercialisation Australia is currently developing a concept of working with existing industry bodies and conferences to include partnering components in their programs under the banner of "Accessing Innovation". Sessions will include an example of successful public sector research/industry collaboration, programs available to facilitate interaction such as R&D tax credit and EIP and some examples of quality projects seeking partners and investment. The first of these initiatives is scheduled for May 2015 in collaboration with Austmine.

Early stage venture capital

- It is well known that the early stage technology investment market in Australia is not well developed. Mechanisms that encourage institutional and angel investors to participate in the market should be explored. The Israeli Incubator program has achieved success in supporting early



stage technology based opportunities and promoting private investment in this space
<http://www.incubators.org.il/>

- Favourable tax arrangements such as those in place in Israel and the UK are models worthy of consideration. In Israel, nonresidents are exempt from tax on gains derived from the sale of shares allocated to them by an Israeli-resident company in consideration for their capital investment, as long as the that Israeli company was classified as a “R&D intensive company”. See also the UK’s Enterprise Investment Scheme <http://www.hmrc.gov.uk/eis/>
- Programs that encourage international investors to visit and become familiar with the Australian market are another way to encourage investment. One example is the OzAPP Awards that attract investors from the US and Europe to Perth to see the best new mobile web and cloud applications from the region www.ozapp.com.au .