

Response to the 'Boosting the commercial returns from research' discussion paper by the EMCR Forum of the Australian Academy of Science

Introduction

The Early- and Mid-Career Researcher Forum of the Australian Academy of Science provides this response to the consultation of the Department of Education and the Department of Industry on how to improve Australia's economic performance through better translation of research into commercial outcomes. The Forum would be pleased to provide further assistance by discussing any of the points raised in this response in greater detail.

There is strong support from across the research sector for initiatives that focus on generating a positive societal impact from research. As the national representative body for early- and mid-career researchers (EMCRs; those with less than 15 years of experience post-PhD), the EMCR Forum of the Australian Academy of Science strongly supports the overarching goal of this Government initiative and in particular, measures to support and enhance entrepreneurship within the research sector. Many EMCRs are actively engaged in this fashion, and many more are keen to follow this path, if conditions for such activities can be improved. Even more EMCRs are keen to actively engage with industry and are seeking opportunities for such engagement.

While the complexity of research today requires large teams led by highly experienced researchers, those creative moments of history-changing insight are still likely to come from the young and less experienced:

- Some of history's biggest and best ideas have come from the very young. Alexander Graham Bell invented the telephone at 18, George Westinghouse the rotary steam engine at 19, and Australia's Lawrence Bragg won the Nobel Prize for Physics at the age of 25.
- EMCRs who have less established research careers are in a better position to, and are more willing to pivot their careers around a new idea.
- The EMCR Forum receives significant feedback expressing that our constituency is eager to have the flexibility to move between employment in industry and the research sector.
- EMCRs are far more likely to make the jump from academia to startup than their more established, and perhaps tenured colleagues.

As such, any changes to government policy settings should very carefully consider the impacts on EMCRs as they will be a critical component of any improvements to Australia as a source of innovation.

Both on the basis of EMCRs making up a significant proportion of the research community, and because of the specific perspectives listed above, the EMCR forum wishes to comment on the Government's initiative to increase the commercial return on research.

Responses to specific points discussed in the paper

Research excellence

The discussion paper makes special comment on Australia's research excellence as a key driver of commercial return. **The Forum gives its strong support to the statement that "Stable, predictable funding over the long term is also important for a high performing research sector" (page 5).**

Even within the context of the opportunities presented here, and the well-understood need to change settings in order to reposition Australia's research, any sector without stability and predictability will be unable to attract and maintain the most talented individuals.

The Forum gives the strongest possible support to calls from the Chief Scientist for a national science strategy.

Opportunities

Of the specific requests for input in the discussion paper, the EMCR Forum responds to eight proposals.

1. Modify rules for competitive research grants to appropriately recognise industry-relevant experience.

The Forum supports this measure as a no cost option to provide incentives for the desired outcomes. Anticipated outcomes of this measure include:

- i. Directly modifying the priorities of researchers, making industry experience more sought after, and driving researcher/industry engagement from the research side.
- ii. Altering universities views on industry experience, with a likely consequence being a greater emphasis on industry engagement in staff profiling, hiring and promotion processes.
- iii. Offsetting the loss of research currency (e.g. publications) for researchers who spend time in industry. This could have a very large impact by allowing greater mobility for researchers between the research and industry sectors and could make part-time industry/research positions viable.

While the Forum strongly supports these measures, care must be taken in allowing for stability and predictability, or Australia risks losing its best researchers to foreign economies, where post

Global Financial Crisis recovery is adding significant competitiveness into the global research sector.

2. Consolidate existing programmes that focus on collaboration with industry to increase their scale and effectiveness

The Forum encourages and supports the consolidation of industry programs into a few key programs rather than multiple programs. The large number of schemes and variety of contractual requirements acts as a barrier to participation and adds complexity and legal costs once participation has commenced.

3. Consider whether the R&D Tax Incentive sufficiently encourages collaboration between industry and researchers

Early-stage ideas in Australia receive less than 1/6th the investment of the US (as a percentage of the GDP). The comparison to Israel, a recognized world leader in innovation, is far worse (1/50th).

The dramatically low level of investment in early-stage technology in Australia is a key factor in reduced engagement between researchers and industry. Measures encouraging this investment are critical. A prime example of this is the excellent return on investment both to industry and to the Government from the Research and Development Corporations.

4. Develop a roadmap for long-term research infrastructure investment, in consultation with the research sector and industry

The Forum strongly supports this proposal. A whole-of-government, long-term research infrastructure planning is necessary for the research sector to remain productive and to successfully engage with industry.

5. Strengthen IP guidelines for researchers

While all researchers have an interest in patenting, many Australian researchers know very little about it. In addition to strengthened guidelines, readily available educational and training resources from trusted national bodies could have significant impact.

6. Examine the potential to link research funding to the dissemination of IP

In the absence of sufficient commercial investment into early-stage ideas, low levels of patenting may be appropriate. More patents would require more investment, and driving up the rate of patenting may not result in additional outcomes.

The Forum encourages a careful approach in dealing with IP issues, to avoid the potential loss of valuable research resources.

7. Increasing industry relevant research training

The Forum strongly feels that the key missing factor for higher employment levels of researchers in industry is not training, but the lack of investment by industry in activities where the skills of postgraduate qualified staff are relevant. While the investment in innovation within Australian industries is less than 1/8th of that in the US, and less than 1/30th of world leader in investment in innovation - Israel¹, large numbers of postgraduate qualified staff are currently not needed in the industry sector.

In its recent submission to the Senate Economics References Committee inquiry into the Australia's Innovation System, the Forum put forward a number of recommendations to improve the mobility between academy and industry (see www.science.org.au/sites/default/files/user-content/emcrforumsenateinquiryintoaustraliasinnovationsystem.pdf, Recommendation 14 in particular², page 11).

8. Improve assessment of the research system, including improved metrics on engagement and knowledge transfer with industry, as well as research outcomes and impact

You cannot manage what you cannot measure and what you measure drives behaviour. The Forum strongly supports the Government in the development of new metrics as a tool to enhance the management of this endeavour.

However, the Forum strongly cautions the Government that history both locally and overseas shows that most dramatic alterations of the systems of metrics have been far less successful than anticipated. Metrics are invariably backward-looking whereas changing behavior is more about doing things differently into the future. Metrics need to be as current as possible and should inform rather than drive strategy going forward. The development of new systems of metrics should involve significant consultation with all relevant stakeholders as well as detailed analysis of the outcomes from similar endeavours, with particular emphasis on these outcomes in similar economies overseas.

¹ OECD (2014), *Entrepreneurship at a Glance 2014*, OECD Publishing. DOI: [10.1787/entrepreneur_aag-2014-en](https://doi.org/10.1787/entrepreneur_aag-2014-en)

² 14. Incentivise industry to offer research pathways for EMCRs (even as partnerships with universities). Extending Recommendation 1 further, create incentives, which make it attractive for industries to employ researchers. Australia produces 6,000+ PhD Graduates every year with limited opportunities for continuing employment in Australia (only three researchers in 1000 workers as noted above). This means significant investment in research training is lost, either overseas or through under-employment of graduates. Encouraging and enabling industries to create secondments or internships for EMCRs would inject innovation and innovators into Australian industry. Potential for university–industry partnerships to offer EMCR opportunities could also be explored, with a co-investment matched by grant support (this has been loosely enabled by the ARC Linkage Projects scheme).

Conclusions

Historically, EMCRs are responsible for the ideas that can create huge opportunities for economic benefit to society and have enough freedom to dramatically alter their career paths to take advantage of those ideas when they occur. However, this is only possible when the settings allow this to happen.

Australian EMCRs strongly support both the overarching goal of this initiative and in particular, measures to develop and enhance entrepreneurship within the research sector.