

R&D Tax Incentive Review

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Thank you for the opportunity to contribute this submission. As the Turnbull Government is strongly emphasizing, innovation is crucial to Australia's future, and it is therefore important to ensure that government policies that support it are fit for purpose. We believe that it is time to reassess whether the present R&D Tax Concession is fit for purpose because:

1. 'R' is unlike 'D' and they have to be treated differently.
2. R&D is changing with many more contributors than just companies and entrepreneurs.
3. Although it is important, R&D is not the only stimulus to innovation.
4. Australian companies preference 'D' over 'R', which doesn't take advantage of Australia's research strengths nor provide distinctive competitive opportunities.
5. Many competitor countries are accelerating away from us in the investments in R&D and innovation that are so crucial for future economic growth and social well-being.

We have to note, however, that crucially any changes to the tax concession have to be accompanied by adjustments elsewhere in a systemic and long-term policy framework.

After some basic observations about R&D, we consider their implications as points of principle for the terms of reference for the review of R&D tax concessions, especially concerning its need, design and theory, and outcomes and impact. Greater emphasis should be placed, we believe, on promoting collaboration, research rather than development, and investment in management capability, especially in leading innovation and in translating research findings.

Observations on R&D

'R' is unlike 'D'. Research generates new knowledge, which can be basic or applied in nature. Development selects and shapes existing knowledge in the form of designs, product, services and processes. Whereas research can be uncertain in its outcomes, development has clear inputs and objectives. In this sense, although 'D' can be

technically challenging and may depend on ‘R’, it is more easily replicable by competitors anywhere in the world. By contrast, the conditions in which ‘R’ is undertaken - such as the quality of the research sector and extent of research/business collaboration - and the management of its associated risks, are potential sources of distinctive competitive advantage.

There are many more contributors to R&D these days. R&D is no longer only undertaken by corporate laboratories and entrepreneurs. The development of ideas and knowledge and their application occurs through interactions of many more players including the users and consumers of innovation. Ideas are nurtured in universities and research organizations, collected from innovation jams and hackathons, and brokered by internet-based intermediaries. In science, NGOs, citizen’s groups, on-line communities and new markets, such as the Science Exchange and Petridish, have emerged. Innovation is in some cases becoming more ‘open’. Many of the best ideas come from the street. R&D is now ‘distributed’ in networks and communities.¹

Most R&D around the world is undertaken in a few industries. These include automobiles, information and communications technology, and pharmaceuticals and health. Other industries innovate with much lower R&D intensities. Services, for example, which account for 70-80% of economic activity in developed economies, do little formal R&D, and companies involved in infrastructure projects, so important for modern economies, again invest little in R&D. Lists of the world’s largest R&D spenders differ from lists of the most innovative companies. Although it is important, R&D is not the only stimulus to innovation. Depending on the nature of their market, some companies compete through the direct use of R&D, while others draw on opportunities created through combining insights from multiple sources that might include research.

As ‘R’ is different from ‘D’, and because Australia’s industry structure is weighted towards non-R&D intensive sectors, and as R&D is increasingly distributed amongst many different types of organization, the question arises of what, actually, is the core purpose of the R&D tax concession and why it assumes such significance in our suite of support mechanisms? To address these questions - and particularly in the context of the urgent need to lift our nation’s overall innovation performance - we have to ask why firms undertake R&D.

Why and how should Australian firms do R&D?

R&D is undertaken for a variety of reasons. By stimulating innovation in new products and services R&D can support existing businesses or help firms diversify. R&D can underpin a service to be sold. As well as helping develop new business in-house, investing in R&D helps improve attractiveness to research partners (bringing something to the table), and assists the absorption of knowledge from external sources. Investing in R&D sends a signal to the market, collaborators and to employees that the business is forward thinking and is concerned for the long-term. It

assists companies to predict trends and provides future options for investment that are valuable in uncertain and turbulent business environments. Also, as the Head of R&D at Microsoft once said: “It doesn’t hurt to have smart people around”. Even non-R&D intensive sectors, such as services, benefit significantly from their ability to recruit and collaborate with researchers.²

R&D helps prepare firms for the future and is a central element of their long-term strategic capability.

It all depends upon management capability. What often matters is not the amount of R&D that is being spent, but whether it is being spent wisely. Much depends on how R&D is organized in the firm and how well it is managed. Investments need to be made when it is difficult to assess the returns to investments to R&D. Traditional accounting techniques, such as those used in capital investments - net present value, discounted cash flows etc., for example - do not work. There are many factors affecting the returns to investment in R&D that are not directly attributable to particular R&D projects. How, for example, do you account for existing versus new knowledge? What is the contribution of marketing or operations to success rather than R&D? How do you assess what collaborators and partners have contributed? Sophisticated firms, such as Philips and Nestlé, use techniques such as option values of R&D or historical extrapolations.³ Essentially, the returns to R&D are best assessed by recourse to the strategic development of the firm.

How should government policy change?

Before we address this question we have to make the crucial observation that all supports for innovation have to be seen as part of an overall package. We have at all costs to avoid the curse of Australian innovation policy of being piecemeal, opportunistic and short-term.⁴ Any changes to the tax concession must be accompanied by adjustments elsewhere in a systemic and long-term policy framework.

In the light of the above observations about R&D, however, supportive policies should prioritise:

Collaboration rather than individual firms. A common justification for government investing in R&D is ‘market failure’... That is, as research can produce benefits that accrue to a broader constituency than the firms that invest in it – including competitors – firms need to be incentivized to spend money on it. Firms can be expected to spend money on research that benefits their bottom line, but government is concerned with the wider public interest i.e. the market alone fails to encourage investments that produce broader social and economic advances, so government needs to step in. This implies that it is the individual firm that is the source of the investment, rather than resulting from distributed efforts. In a more modern interpretation, it is not the market that fails in producing advances beneficial to society, but the system, and hence it is collaborative efforts that should be supported.⁵

'R' rather than 'D'. Government support should prioritize activities that are not easily replicable i.e. research, where there is risk and uncertainty, rather than development where much of the uncertainty is removed. It is reasonable to ask why firms experienced in development projects, where viability and risks can be quantified, should be subsidized. Government intervention on market failure grounds is less justifiable in 'D'. Where firms are inexperienced in development projects – for example in small firms and start-ups – risks can be ameliorated by direct policy interventions, such as procurement contracts and knowledge transfer initiatives. This particular element of support for small firms is important because, as the international evidence suggests, we are good at starting firms in Australia, but poor at growing them.⁶

It is notable that less than 3% of the \$19.7 billion claimed as R&D as part of the R&D Tax Concession process is spent in universities and research organizations where approximately 70% of the nation's researchers are based. As universities and our other research institutions are major sources of research knowledge, this implies the vast bulk of government support is directed towards activities in the R&D spectrum that are not research related and are relatively easily replicable and provide little distinctive advantage. This inattention to research is also seen in the comparative paucity of PhDs employed in Australian industry. Policies that promote collaboration between business and researchers should be prioritized, recognizing that the best researchers are commonly the most externally engaged and leading companies will want to work with the best researchers.⁷

Capabilities rather than projects. R&D potentially has rich contributions to make to the strategic development of firms, their productivity, competitiveness and sustainability. It is limiting, therefore, to assess returns to R&D on the basis of rates of return to particular projects, or in new products and services, which are in any case hard to measure. The true value of government support for R&D could best be assessed through observed behavioural change over time. That is, continued government investment in R&D in firms should only reward those firms that maintain or increase their investments over time and indicate the wide range of benefits of R&D. Although in recent years business commitments to R&D are increasing marginally in real terms, and becoming a larger portion of total R&D spend, they are declining as a percentage of GDP. That is, as our economy grows, businesses are investing proportionately less on R&D. This is not indicative of a movement to a more knowledge-based economy and shows our current system has not changed behaviour. The best way to change behaviour is an improved strategic mindset and enhanced skills in managers. Greater priority should therefore be placed on management education and training and the research that improves their performance, indicated, for example, by increasing numbers of graduates and technically trained staff and attendance at research-based innovation and entrepreneurship courses. Boards of Directors need to get out of their present cost-cutting mentality and into investment mode, manifested in part by the appointment of Innovation Directors and regular Board innovation reports.

A final observation

Economic justification of R&D Tax Concessions has always been discussed in the context of mainstream economic theory, such as ‘market failure’. Yet the capacity of mainstream economic theory to explain the complex, uncertain and turbulent world of innovation is open to doubt. Just as in physics, where Newton’s, Einstein’s and Quantum approaches all offer partial explanations, it is time for economic analysis to move beyond one grand theory. Mainstream economic theory’s rationale for government investments in R&D would valuably be enhanced with recourse, for example, to evolutionary economics, with its emphasis on systems, experimentation, learning and failure, and behavioural economics, with its inclusion of psychological factors in decision-making. These alternative approaches are enriching policy analysis in the UK and elsewhere and could beneficially be adopted here. The very high degree of indirect funding for R&D through tax concessions found in Australia, as compared, for example, to the high degree of direct funding in the USA and Finland, is explained by our reticence to move beyond traditional economic theory applied to government intervention.

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¹ See, for example, Dodgson, M, Gann, D and Salter, A (2008), *The Management of Technological Innovation*, Oxford, Oxford University Press.

² <https://royalsociety.org/topics-policy/publications/2009/hidden-wealth/>

³ For a consideration of the broader implications of financing innovation, see Hughes, A (2014), “Capital Markets, Innovation Systems, and the Financing of Innovation”, in Dodgson, M, Gann, D and Phillips, N, *The Oxford Handbook of Innovation Management*, Oxford, Oxford University Press. Adams, A, Bessant, J and Phelps, R. (2006) “Innovation Management Measurement: A Review”, *International Journal of Management Reviews*, 8,1:21-47, provide an overview of the measurement of innovation.

⁴ See e.g. <http://acola.org.au/index.php/projects/securing-australia-s-future/saf09>

⁵ For an elucidation of this view, see: “Systems thinking, market failure, and the development of innovation policy: The case of Australia”, M. Dodgson, A. Hughes, J. Foster and S. Metcalfe, *Research Policy*, 40, 9:1145-1156, 2011.

⁶ See e.g. <http://thegedi.org/countries/australia>.

⁷ see e.g. Perkmann, M., R. Fini, J.-M. Ross, A. Salter, C. Silvestri, V. Tartari. 2015. Accounting for Impact at Imperial College London, Imperial College, London.