Response to the Productivity Commission Draft Research Report on Public Support for Science and Innovation

1. Introduction

The Group of Eight (Go8) welcomes the broad thrust of the Commission's Draft Research Report on Public Support for Science and Innovation (the Report).[1] In particular, the Go8 supports the Report's findings about the value of basic research, the need to focus available resources to support research and training of the highest quality and to ensure that funding targets public good research where the flow of economic, social and environmental benefits is likely to be greatest. Studies such as this are very important because they provide governments with the evidence-base necessary to inform decisions about what are complex issues. This submission summarises the Go8's response to the Report as a whole and provides specific comments on the draft findings of specific relevance to Australia's research-intensive universities.

2. General observations

2.1 Strengths

The Go8 notes that, like the then Industry Commission's 1995 study into Australia's R&D systems, the Productivity Commission has again found strong theoretical and empirical evidence in support of significant public investment in Australia's science and innovation systems. In the main the Report represents a balanced and comprehensive appraisal of the situation following broad-based consultation with interested parties during the drafting process.

The Go8 welcomes the general thrust of the Report's finding on issues such as:

- the overall value of public investment in science and innovation;
- the value of basic research in the science and innovation systems and the diverse economic, social, cultural and environmental benefits that flow from it;
- the need to focus available public funding to support *public goods*, activities where *spillovers* are likely to be greatest and where *additionality* is maximised;
- the importance of focusing available resources on supporting high quality research and human capital development;
- the direction the Cooperative Research Centres (CRC) program should take in the future;
- the state of public support for research infrastructure;
- the place of research commercialisation in publicly funded institutions;
- impediments to research commercialisation and other forms of knowledge transfer;
- the balance of university research funding between block and competitive schemes;
- the sustainability of the *leveraging* or *matching funding* model that underpins most competitive research grant schemes;
- the need for improvement in program evaluation; and
- the approach that should be taken with the Research Quality Framework (RQF).

[1] The Productivity Commission Draft Report is available at: http://www.pc.gov.au/study/science/draftreport/index.html

2.2 Some issues for consideration

2.2.1 How much to invest in our science and innovation systems?

The Report's key finding about the adequacy of the quantum of public funding for science and innovation in Australia is not strongly supported by the evidence presented in the Report. Having examined all the available evidence and concluding that the rates of return from investment in R&D are high, the Report then finds that the 'results are too imprecise to provide a clear case for significant further funding' (p.xxx) and that the information requirements necessary to determine the optimal scale and mix of public funding for science and innovation are too demanding (p.8.1). Further, the Report suggests that the marginal costs of any further public investment may outweigh the marginal benefits, though little evidence is provided about how this conclusion is reached. The issues are therefore left as matters for political judgement—to be informed by available evidence (p.8.1). These conclusions do not provide current and future governments with sufficient information to guide future decisions about levels of investment and the funding mix.

The Go8 accepts the Commission's arguments about the need for caution in applying international R&D benchmarks and the role of national R&D targets (p.8.1). However, we would encourage the Commission to set out more clearly the decision-making framework that has underpinned the Report's conclusion that current public investment levels are appropriate.

The Government currently benchmarks Australia's science and innovation performance annually using a range of OECD performance indicators.[2] The appropriateness of the scorecard does not appear to have been considered by the Commission. For reasons that are well understood the Commission is sceptical about the value of many international 'input' metrics, but appears to have more confidence in a variety of 'output' and 'outcome' measures, such as the World Competitiveness Index. A listing of those performance measures that the Commission believes should be used to inform future funding decisions would greatly strengthen the Report.

2.2.2 Rationales for support and the core role of universities

In its original submission the Go8 stressed the role that Australia's research-intensive universities play in providing access to and the capacity to benefit from the 99 per cent of research that occurs outside Australia. The argument had two elements. First, that without adequate numbers of sufficiently knowledgeable and skilled people, Australia's ability to make the most of the *spillover* opportunities arising from the global research effort, is diminished. Second, that without strong international research links, Australia risks missing out on early access to and understanding of the discoveries and advancements made elsewhere. It was further argued that it is a nation's willingness and ability to contribute to the global knowledge pool that provides the basis for accessing and using the knowledge and data that emerge from the pool.

The Go8 welcomes the Report's finding that the core role of universities remains the provision of teaching and the generation of basic research (p.xxvi). However the issues of

[2] See Annual Backing Australia's Ability, Innovation Reports, http://backingaus.innovation.gov.au/2001/statement/index.htm

Australia's relative capacity to exploit global research advances and the role of international science linkages in providing access to these advances, do not appear in the *Rationales* section of the Report (p.3.1), or in the list of *Bottom Line* reasons for public support of our science and innovation systems (p.3.36). The Go8 would encourage the Commission to acknowledge these roles.

2.2.3 Human capital issues

The Report addresses labour force issues (p.5.7 and appendix L) at length, concluding that concerns about skills shortages in the science and technology areas are largely unfounded. It refers to overall growth in Australia's science and innovation workforce over the last ten years, evidence of growth in PhD graduations and a net *brain-gain*, to support the conclusion that skills shortages tend to be cyclical, rather than structural and that any policy responses are likely to have limited impacts (p.5.6). The solution is said to lie largely in market mechanisms, with skills shortages inevitably generating price signals and the supply of labour adjusting accordingly (p.5.6 & L.14).

This conclusion ignores the fact that while Australia's labour market may function something like the *free-market* the Commission envisions, its higher education system does not. The funding and regulatory framework under which Australia's universities operate prohibits them from responding to market signals and risks their capacity to provide high quality training into the future.[3] Further, Australia's universities must compete globally in the private and public sectors to recruit top quality teaching, research and general staff. However, their capacity to do this is hindered by regulatory constraints and indexation of block funding that falls well short of real increases in costs.[4]

If the solution to any skills shortages Australia may face in the future relies on market agility, then it follows that Australia's universities should be allowed to operate in a way that permits them to be more responsive to market signals.

3. Comments on specific draft findings

3.1 Draft finding 5.1

Several impediments to innovation should be addressed:

- *major publicly funded research infrastructure should be priced to maximise utilisation, while avoiding congestion;*
- *there should be national consistency in the application of privacy regulation and in ethical review of multi-centre research;*
- *published papers and data from ARC and NHMRC-funded projects should be freely and publicly available; and*
- *there should be greater flexibility in pay structures for teachers to help address science and maths teacher shortages.*

Comment

[3] Group of Eight, Pre-Budget Submission (November 2006), http://www.go8.edu.au/policy/current.htm
[4] See, for example, Group of Eight (December 2004) Position Paper on the Indexation of University Grants, http://www.go8.edu.au/policy/previous.htm#2004

The general thrust of this finding is supported, though the list of impediments to innovation in Australia is considered rather limited in its scope. Regarding research infrastructure, while issues of utilisation, duplication and usage are important, the greater risk is that without continued investment over the longer term, Australia's stock of research infrastructure will fall behind that of our international competitors. While the National Collaborative Research Infrastructure Strategy is welcome, it is important that the impact of this program is properly evaluated and funding certainty provided beyond 2011.

The recognition of the strains being placed on Australia′s research-intensive universities by the continued erosion of research block grants as a proportion of overall research funding is timely (p.11.24). While institutional block grants are increasingly locked in to *match* or *leverage* competitively won funds, the dual funding model is strongly supported as a sound mechanism for assuring quality and focusing research in areas of national priority. Therefore, the Report′s support for the continuation of the dual funding model, with a level of block funding that ensures institutions have the capacity to adequately support competitive schemes and make strategic choices about the direction of their research, is sound. However, the substantial increases in funding for competitive schemes that has occurred over the last five years under the *Backing Australia′s Ability* package (including the National Collaborative Research Infrastructure Strategy) has placed significant financial pressure on institutions. With further competitive funding increases in the pipeline, the sustainability of the *leveraging* model must be questioned. At the very least, total funding provided under the Research Infrastructure Block Grants scheme should be increased to a level sufficient to support competitive grants and all future increases in competitive funding should be accompanied by a commensurate increase in block funding.

The erosion of university block grants and the resulting consequences are an impediment to the efficient operation of the dual funding model and therefore to the innovation system more broadly. We therefore encourage the Commission to acknowledge this impediment in the final report.

The benefits of the wide dissemination of the outputs of publicly funded research are well recognised in the Report. The Go8 supports public access policies that make research freely available and notes the steps initiated in this regard by ARC and NHMRC. There are of course important exceptions that will need to be made such as for commercial or national security reasons.

3.2 Draft finding 6.1

Decision making within universities in relation to the transfer, diffusion and utilisation of research outputs should not focus unduly on an objective of commercialisation to the detriment of maximising the social return from the public's investment.

Comment

The Report's findings regarding research commercialisation in the university context are sensible, balanced and refreshing. As the Go8 has recently stressed elsewhere,[5] Australian

[5] See for example, Group of Eight (August 2002) *Submission to the House of Representatives Standing Committee on Science and Innovation Inquiry into Business Commitment to R&D in Australia*, Canberra; Group of Eight (May 2005), *Submission to the House of Representatives Standing Committee on Science and Innovation Inquiry into Pathways to*

universities currently receive public funding to support their teaching and research activities, but have access to very limited funding to support their research commercialisation activities. Despite these funding difficulties and critically, a lack of funding at the proof-of-concept stage, the overall research commercialisation performance of Go8 universities has improved significantly over the last decade. The latest National Survey of Research and Commercialisation, to be released in the near future, is expected to confirm these trends.

Research commercialisation is but one of many ways by which universities transfer knowledge for the benefit of the wider community. While policy settings should not discourage research commercialisation *per se*, it is not the method of knowledge diffusion that matters, as much as the fact that the knowledge arising from publicly funded research is transferred for public benefit. The Commission's finding that there is a legitimate case for new mechanisms to facilitate knowledge transfer is therefore welcome (p.6.54). While Go8 universities already dedicate significant resources to support activities designed to transmit knowledge and ideas for the benefit of the broader community, there is capacity to do more. Of the options the Report canvasses, block grant supplementation is favoured due to the greater flexibility and lower overhead costs. Unfortunately, regulatory constraints that limit the capacity of institutions to earn additional income from their core activities, combined with the *leveraging* burden that comes with success in competitive research funding schemes, mean there is currently very little spare capacity to dedicate to knowledge transfer initiatives (p.6.55).

In its supplementary submission to the study the Go8 drew attention to two recent tax rulings with the potential to jeopardise the commercialisation activities of wholly-owned university companies.[6] While the Report acknowledges the obstacles to improved commercialisation outcomes from publicly funded research posed by various aspects of the tax system, the Go8 supports a stronger finding about what can be done to address these impediments (p.6.46).

3.3 Draft finding 11.1

Consideration should be given to delaying the adoption of the RQF further, while undertaking the following investigations and analyses:

- *continue with limited trials based on RQF peer-review principles, but focus them on providing indicators of the quality and impact of research dependent on block funding;*
- *systematically examine whether current procedures within institutions are sufficiently rigorous to promote quality and impact of block-funded research;*
- *examine what fine tuning of existing formulae, if any, might be advantageous in promoting incentives for continuing enhancement of quality and impact of research funded through block funding; and*

Technological Innovation; Group of Eight (September 2005), *Report on outcomes of 8 July 2005 Tech Transfer Workshop*; Group of Eight (August 2006) *Submission to the Productivity Commission's research study on public support for science and innovation in Australia*.

[6] Group of Eight (17 October 2006) *Supplementary submission to the Productivity Commission's Study of the Value of Public Support for Science and Innovation*, Canberra.

- *examine the merits of externally applied, risk-minimisation approaches to enhancing the quality and impact of block-funded research (applied in conjunction with formula-based funding).*

Comment

The Go8 strongly supports the Government's objective of establishing a robust framework for identifying and rewarding publicly funded research of the highest quality and impact, but shares some of the reservations expressed in the Commission's Report. The Government's recent decision to adopt a preferred model and proceed with a trial in 2007 does not diminish the relevance of the Commission's recommendations.

The trial must demonstrate a cost-effective and robust mechanism for comparing performance between institutions and research teams. The assessment mechanism must have international credibility, modest compliance costs and encourage behaviours that benefit the nation's overall research effort. The Go8 supports an assessment process that uses performance metrics that can be validated by peer review and a funding model that rewards excellence. The focus on research excellence is a fundamental driver of all internationally respected models of research assessment. There is a prospect that an RQF could become a burden to researchers, be expensive to administer and deliver very little reward to support and stimulate the best quality research. The use of caps to limit the redistribution of research funding, for example, would appear to be at odds with the objectives of the program. Further, under the proposed RQF model, institutional performance in 2001 will still be influencing funding outcomes in 2014. While the current formula-driven block funding support for university research has some inadequacies, it has the advantage of being much more responsive to changes in research performance.

4. Conclusion and Recommendations

The Go8 commends the Productivity Commission for the production of a comprehensive and balanced Report. Once finalised the Report will make an important contribution to understanding the value of public support for science and innovation and the economic, social, environmental returns that flow to Australia as a result of the substantial support the Government provides each year. Importantly, the Report points to a variety of areas where adjustments can be made to enhance the efficiency of programs and better target available resources.

While the Go8 welcomes and supports the majority of the Report's conclusions and findings, concerns are held that its finding regarding the overall adequacy of current investment levels (8.1), will not be as helpful for current and future decision-makers in government as it could be. As it stands, the Report will assist the Government to assess the appropriateness of its current investment in R&D, in particular under the *Backing Australia's Ability* initiatives. However, in the absence of additional information such as that suggested under Item 2.2.1 above, its utility will quickly diminish over time. A future Australian government will inevitably face the same challenges as the present one, in assessing the value of public support for its science and innovation systems and the return on that investment. The Report would be significantly strengthened therefore, if the final version could include:

- a concise explanation of the decision-making framework that underpinned its conclusion that current levels of public support for science and innovation in Australia are adequate;
- a list of the economic and non-economic performance metrics the Commission considers are valid indicators of the health of the nation's science and innovation systems; and
- a summary of the gaps in the evidence-base that would need to be filled before an optimal decision-making framework could be developed.

The Go8 looks forward to further discussions with the Commission about these and other issues, as it finalises the Report.