HIGHER EDUCATION AND RESEARCH GROUP
HERG

The Secretariat
Review of Higher Education
Department of Education
Commonwealth of Australia
Canberra

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Dear Members of the Review Panel and Secretariat

Thank you for the opportunity to provide a submission as part of this initial consultation process. We welcome this review of Australia's higher education sector. There have been many changes in the sector in the past decade or more, and it seems timely and important that this review supports the creation of policy settings that are fit for purpose for today's environment.

This submission is focused on a single key issue in the Terms of Reference: the investment in and affordability of Australian higher education. The submission looks at how the Terms of Reference for this element of the Review could be framed in a way that supports certain practical outcomes for the sector and key stakeholder groups. The discussion and analysis that follows has been prepared with significant input from our research and data analysis team. This team has considerable expertise in respect of the matters discussed.

The matters we raise are, in our view, crucial in crafting a strong and sustainable future for Australia's higher education institutions.

Yours faithfully

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Submission by the Higher Education and Research Group

This submission focuses only on the third of the 'key areas' nominated in the terms of reference (ToR), that is, the matters headed: 'Investment and affordability'. The description of this area states that the review seeks to "explore funding and contribution arrangements to deliver equity, access, quality and longer-term investments to meet priorities in teaching, research, workforce and infrastructure".

HERG offers the following comments to help clarify, strengthen and provide a mechanism to operationalise important aspects of this key area of the review. Additional material including data and empirical evidence can be provided at a later date if desired.

Context:

For some decades, a key element of the policy arrangements surrounding the funding of Australian higher education is that the financial burden is shared between the Federal Government on the one hand and the students benefiting from the provision of that education on the other. This differs in certain key respects from the funding arrangements for government primary and secondary school education.

The Federal Government contribution is likely linked to the existence of the public good that arises out of education – that is the benefit of having a better educated citizenry. There is also a private good element. This arises for those who receive a higher education in that they typically receive, on average, higher lifetime incomes than would otherwise be available.

Still today, an examination of the financial statements of the 37 public universities reveals that the two single biggest contributors to the revenue received by these government institutions are:

- The Federal Government via several funding arrangements, and
- Student tuition payments - either via HECS or other tuition fee income.

There are also other, generally more modest, income streams to universities, including funding for research from commercial and other entities, state and territory government funding, philanthropic donations and a small number of other sources. However, the great majority of the revenue received by Australia's public universities continues to be generated from students and the Federal Government.

Therefore, in respect of questions about investment and affordability, the two largest key stakeholders are these two groups: the Federal Government and the student body. This submission is aimed at clarifying, strengthening and providing an operationalisation of this key aspect of the ToR with these two stakeholders in mind.

Introduction to the Recommendation Proposed in this Submission:

In this submission, we propose that certain clarifications and strengthening of the ToR would be advantageous to the longer-term sustainability of the higher education sector and provides a strengthened transparency and accountability for the investments made.

We recommend that consideration be given to the provision of a clear and operationalised measure of 'investment and affordability'. Like the provision of services from other key government-owned or operated organisations, we would argue that a clearer understanding of 'value-for-money' is crucial for the ongoing sustainable funding of the higher education sector, including the public universities.

A key feature of purchase decisions – whether in respect of purchases by individuals or by governments, is 'value for money'. Value for money can be seen as the measure of the outcomes delivered relative to the investment made (or cost incurred). Another way of describing outcomes per dollar of investment is the 'productivity' delivered for the investment made.

As a key element of the work of the review, we would recommend that:

Consideration be given to putting in place, as a key indicator of 'investment and affordability', a measure of higher education productivity – both at whole-of-sector and individual institution levels.

This notion of 'value for money' is a key element in, for example, the purchasing policies of many government agencies and is a central pillar of 'performance auditing' conducted by the Australian National Audit Office (ANAO). The ANAO undertakes performance audits on a range of Federal Government agencies and programs[1].

Value for money comes from obtaining the desired outcome for a given level of cost. Using the language of mathematicians, it is the 'optimisation' of the purchase decision. Several government agencies consider issues relating to this – including the Australian Bureau of Statistics (ABS) and the Productivity Commission (PC).

In recent years, the ABS has published measurements of university productivity (involving measurements of both research and education) on a whole of sector basis (see ABS, 2021 and Annabel et al., 2020). That is to say, the ABS looked at the outcomes achieved by universities for the level of funding provided.

The notion of measuring 'value for money' or 'productivity' has been used in other government organisations and was key to the implementation of, for example, the 'case-mix' approach to hospital funding. Case-mix funding is in wide use internationally where government involvement in health is dominant and is now used in a number of Australian jurisdictions.

Note that we distinguish between the community-wide productivity effect associated with the presence, extent and quality of higher education as distinct from the productivity of higher education itself. The former looks at questions such as the benefits to a nation of having a highly educated workforce. The latter examines the issue of accountability of outcomes achieved relative to the investments flowing to higher education providers individually or collectively. This submission is focussed on this latter issue.

Defining and Measuring Productivity:

The ABS is one of a number of authorities that define productivity. The ABS states that it is: "the ratio of a volume measure of output to a volume measure of input; that is, output per unit of input"[2]. They also note that productivity can be measured "for an individual entity, for an industry or sector of the economy, or for the economy as a whole." They add that positive productivity growth is where "an increase in output, a decrease in inputs or a combination of both" occur. Technically, some would argue that the static measure of inputs and outputs is not a measure of productivity but a measure of efficiency – that is: what can you get in the form of output for a given level of input or what level of input is needed to achieve a given level of output. This definitional approach goes on to say that the change in efficiency over time is

[1] At present the ANAO does not undertake performance or 'value-for-money' audits of the public universities as they are, in general, organizations created by state or territory legislation. Discussions with one state Auditor-General (VAGO) revealed that that agency also did not undertake performance audits as the funding for universities was seen as being a matter for the Commonwealth Govenrment.
[2] https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/5260.0.55.002main+features22016-17.

productivity or productivity growth (or decline). Productivity growth is a change in what it takes in terms of inputs to obtain an outcome or, outcomes.

Some might argue that the principal authority on productivity in Australia is the Federal Government's PC[3]. That body states that: "productivity is the efficiency with which firms, organisations, industry, and the economy as a whole convert inputs…..into outputs. Productivity grows when output grows faster than inputs, which makes the existing inputs more productively efficient".

The Reserve Bank of Australia (RBA) also defines productivity along similar lines, stating: "Productivity increases when more output is produced with the same amount of inputs or when the same amount of output is produced with less inputs"[4].

The Organization for Economic Development (OECD) in its document 'Defining and Measuring Productivity'[5] discusses the concept of productivity and states that "Productivity is considered …..[to be] basic statistical information for many performance assessments".

While there have been some efforts in the scholarly literature to examine university or, more broadly, higher education productivity, there are only a limited number of instances where government agencies have attempted this task. This rarity is partly because of the complexity of the analysis, in particular because of the complexity arising from the presence of multiple outputs in higher education. The existence of two key outputs, teaching and research, is a notable example of the "joint and common costs" problem in productivity measurement[6]. The unique choices made by institutions as to their "mix" of teaching and research is often cited as a reason for not pursuing sector wide productivity measures. There are, however, well documented and robust multivariate techniques for producing valid and reliable measures of productivity that take account of joint and common costs, including in higher education settings. These econometric techniques afford Australia with a unique opportunity to pursue a productivity analysis that honours the unique policy settings of each institution without the difficulties of creating a "league table" of winners and losers. Each institution's productivity is relative to its own signature mix of teaching and research. Thus, we note that collecting, curating, measuring and integrating relevant data, including multiple outputs, is important for reasons of validity. These data can be analysed in ways that produce new insights into the investment and affordability of higher education.

The National Academies of Engineering, Science and Medicine (NAESM) in the US, in their 2012 publication[7], explain some of the reasons for the difficulty of measuring university productivity. NAESM states that: "Productivity measurement involves a conceptually simple framework. However, for the case of higher education, complexities are created by a number of factors". They detail their concerns, stating that "Institutions of higher education in the United States are multiproduct firms (that is, they produce multiple kinds of services)". They also note that there is heterogeneity in the production process – we would argue that this, crucially, includes the fact that some US institutions are highly research-intensive and world-renowned for this, while others concentrate on teaching alone. That is to say, US higher education institutions vary hugely in respect of the teaching/research intensity mix as well as other dimensions, including

[3] Productivity Commission Staff Research Note: On efficiency and effectiveness: some definitions, May 2013.
[4] Reserve Bank of Australia, Explainers: Productivity, 2020
[5] Organisation for Economic Co-operation and Development (OECD), Undated, Defining and Measuring Productivity
[6] The joint and common cost problem is a challenging issue but can be solved where adequate data is available. This matter will likely be included in a subsequent submission by HERG when full submissions are called for in 2023.
[7] National Academies of Engineering Science and Medicine. Consensus Study Report: "Improving Measurement of Productivity in Higher Education (2012)" Chapter: 3 Why Measurement of Higher Education Productivity Is Difficult.

but not limited to scale, level of specialisation and mission. Last but not least of the challenges in the NAESM list is the "gaps in needed data".

The gaps in US data are indeed significant, given that no overarching federal agency collects higher education data, curates data and makes it public. The data largely, if not exclusively, reside at the state level. The data collected appear to vary significantly state by state. The heterogeneous nature of the data and the variations in the definitions used add considerable complexity.

There is far less variability in the nature of Australia's universities. Currently, no university has a narrow specialisation, and all claim to be relatively comprehensive in nature. Indeed, all the universities with names including 'technology' teach and research in a wide variety of fields in the social sciences and humanities. All teach business, and many teach law. These Australian institutions do not directly resemble the technological universities seen in parts of Europe or North America. Thus, in Australia, the challenges relating to the heterogeneity of institutions in terms of discipline mix are not the issue they may be elsewhere[8].

There is variability in research intensity and teaching focus, albeit it rather less so than some other OECD countries[9] . The issue of quality differentiation, also a crucial issue when measuring some aspects of productivity, is dealt with in greater detail elsewhere[10].

University Activity: Its Inputs and Outputs:

There are a number of ways to measure inputs, but the measurement of inputs in Australia is not the real challenge. One can use the total number of dollars spent in conducting the operations of a university in a given year as the key input measure. Alternatively, one could measure and use the total person-years of the academic workforce for a given period. Historically, using expenditures or academic staff is common in university management information systems and decision-making. The use of the time-honoured staff-student ratios has existed for decades as just one example in univariate benchmarking. Other potential input variables also exist. The measurement of inputs without bias is not the principal problem.

Higher education has a more significant challenge in the measurement of its outputs. To obtain and hold the title (and provider category) of 'university', higher education institutions in Australia must have not one output but two – education and research. While there is a requirement to have both, there is no regulated level of mix between them. That is to say, other than extreme positions (that is, no teaching or no research), organisations designated as universities may choose whatever mix of education and research they desire. Put another way, a university can be strongly research-focused or strongly teaching-intensive or somewhere in between. That choice is entirely in the hands of university management. The key limitation is, however, that both teaching and research must co-exist, a requirement not found in some other OECD nations.

The empirical data in Australia are clear; some universities are more education-focused, with a stronger proportion of resources committed to undertaking education rather than research. Equally, there are other universities, including those in the Group of Eight, where there is a stronger focus on research activity. What is equally clear is that no Australian university has zero education outputs or research outputs. The key here is that universities must and do have

[8] See: Parker S, K. Houghton and M. Clisby: Why Alan Tudge is right to talk about Specialization in Universities *The Australian*, June 8, 2021

[9] See Parker, S., A. Dempster, M. Warburton, 2018, at page 11 for a discussion of research and teaching intensity.

[10] See the Explainer document of the Higher Education and Research Group (HERG) entitled: "Quality in University Research and Education" released in 2021.

not one but two key outputs or 'products', and variability in the mix of these outputs occurs under the control of the individual universities. In terms of productivity, there is no inherent hierarchy of these two outputs. As a universal truth, one output is not more important than the other. That said, there are likely to be strongly held personal preferences by some individuals and indeed institutions in the sector.

When measuring productivity, the challenge is to devise a way of measuring productivity that allows for the legitimate and required presence of these two outputs. Any measure of productivity that prescribes some fixed ratio between the output "education" and the output "research" will rightly be subject to criticism based on unintentional (or even intentional) bias. Of course, the actual ratio of research / education intensity might and, in the case of Australia, has changed over recent years. So, adopting any fixed ratio will likely render a productivity measure outdated or even invalid.

Challenges in Measuring University Productivity:

The measurement of the 'outputs' of universities is challenging for a range of reasons. Two of them are worthy of noting here. The first has been discussed and that is that there is not one, but two 'core' outputs from universities teaching and research. Second, there is no independent estimate of the 'market price' of these outputs. These challenges are not insurmountable, but they do require expertise to create a valid and reliable approach.

As noted above, the ABS has been involved in estimating university productivity. It published its findings for the period 2008 to 2017 and found that universities have demonstrated, on average, increased productivity over the period.

As noted by the ABS, there are challenges in measuring university productivity. Some of these go to issues of obtaining valid and reliable data on both research and education. There are excellent measures of both, but assembling this data is not without costs.

The need will be to develop productivity measures both for the sector as a whole and for individual universities. Further, and of some note, is the fact that by 'reverse engineering' the productivity data one can see estimates of the underlying costs within universities and the possible presence and of cross-subsidies within the sector.

Thus, measuring productivity will have the additional benefit of providing policymakers and others with cost estimates of research and education activities independent of the individual universities themselves.

These data could also be of use in estimating the costs underlying programs that are a key public good, such as supporting the education of those from less privileged backgrounds, those who attend university who identify as having a disability and the like.

Recommendation:

It is our recommendation to the Review Panel that:

Consideration be given to putting in place as a key indicator of 'investment and affordability' a measure of higher education productivity – both at whole-of-sector and individual institution levels.

Linked to this is the need to provide a mechanism for how this is to be executed including by what agency (for example, ANAO, TEQSA or other) and by what method, including the possibility of using techniques that account for "joint and common costs" of the two key outputs of teaching and research.

In addition to value-for-money assessments that would be available, adopting this recommendation would provide a transparent, independent measure of revenues, and costs within the sector.

The availability of this data on input and outputs (including costs and revenues) would support the ability to answer important questions including but not limited to:

(a) Are Australian universities underfunded for the scale of research undertaken?
(b) Are the cost estimates used in CGS and HECS payments reflective of contemporary real-world costs?
(c) Are the revenues of education being used to support the costs of research?
(d) Are the revenues designed to support students from less privileged backgrounds for university education sufficient to cover the costs incurred to support these students?
(e) Would strengthened opportunities for specialisation (by Field of Education/Research or intensity of research or education) provide enhanced productivity outcomes?
(f) Are there economies or dis-economies of large scale?
(g) Does the higher education ecosystem in Australia reflect our needs as compared with other countries.

These and other related questions that may be seen as important to policy and sound economic management can be answered when and if the relevant valid and reliable data are collected.

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