

The Performance-Based Research Fund and the Benefits of Competition between Universities

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Introduction

Until the late 1980s, competition between universities was limited, and the allocation of funding by the University Grants Committee created a system that was more akin to central planning than to a competitive market. Following the advice of the Treasury, the Labour government of the late 1980s and the National government of the early 1990s increasingly encouraged universities to compete for students. From 2000 onwards, the Labour-led government began to question the value of competition between public institutions such as universities, and to seek ways to minimise competitive duplication of courses and research programmes (Associate Minister of Education, 2000; Watkin, 2000).

Despite the position of the Labour-led governments since 2000, competition between universities over 2000–06 has been perhaps more vigorous than it has ever been. This is because competition to attract students continues, and a range of schemes such as Partnerships for Excellence, Centres of Research Excellence, and the Performance-Based Research Fund (PBRF) have encouraged universities to enter into vigorous competition for the limited funds available.²

The vigour of the competition is also a result of changes in the international environment. For all sectors, including higher education, both the level of competition and the opportunities for benefit have been increased by the declining cost of travel, the improvement in standard of living of formerly low-income countries, the growing importance of the service sector and the dramatic fall in the costs of communication, including those relating to modes of learning.³ The government has actively promoted ‘export education’ as a strategy for the tertiary sector, which has the effect of placing New Zealand tertiary institutions in direct competition with universities in Australia, Canada, the United States of America (US), the United Kingdom (UK), Europe, and (increasingly) Singapore, Hong Kong and Thailand. Even without export education, the universities now need to

compete with the best universities in Australia to retain the best domestic students in New Zealand, let alone attract students from other countries.

In this chapter, we set the competition promoted by the PBRF in context by considering the costs and benefits of competition in the tertiary sector. We acknowledge the government has been correct in expressing the concern that competition for Student Component funding associated with the introduction of low-quality programmes at low-quality institutions is inefficient. However, we suggest this inefficiency was a result of the perverse incentives provided by the Student Component funding regime and institutional governance arrangements, not a result of competition. Overall, our view is that the weakness of the governance structure of the universities and the difficulties of assessing quality in tertiary education make competition such as that engendered by the PBRF critical for the development of a world-class tertiary education system in New Zealand.

Nature of tertiary education, funding, costs and incentives

In this section, we consider the issues that relate to understanding the costs and incentives facing tertiary institutions. The topic is important if the links between competition and funding are to be understood.

Incentives are substantially affected by the presence of competition, by which we mean a process of rivalry between institutions in markets. It includes rivalry in price, and altered or improved products or techniques of production, brand awareness and reputation, and the provision of information to consumers. Competition produces benefits for consumers, and for society as a whole because it induces organisations to be internally efficient, make the optimal use of resources, and make investment decisions that will provide the organisation with competitive advantages in the future.

Difficulties of measuring quality in service industries

Tertiary education is a service.⁴ As such, it has outputs that are very difficult to quantify. The number of students enrolled represents only the crudest possible measure of outputs, because the quality of the teaching and learning at tertiary education institutions (TEIs) is not directly observable by third parties. While experience (consumption) of TEI services offers intimate knowledge of the outputs, it is really only over time that quality can be evaluated.⁵ Tertiary education is an activity where reputation can be established only over a long time as multiple cohorts of graduates have the

opportunity to reflect on their experience. Reputation matters because it is the basis on which future generations assess quality before experiencing it.

The difficulty in measuring educational quality directly is accentuated by the asymmetry of information between TEI staff and managers on the one side and students and funders on the other. The existence of information asymmetry is a central feature of the modern literature on regulation. Importantly, this literature indicates that firms have more information than the regulators and that this should affect the design of regulatory schemes that, in the case of tertiary education, include public subsidies. Price regulation is normally applied to utilities that produce outputs with tangible indicators of measurement (e.g. mega-watt hours, number of interruptions in supply). It is challenging enough to quantify the goods and services of utilities, but the indicators of educational service are far more difficult to assess and this leaves much scope for staff and management to engage in practices that promote their own interests rather than those of students and funders (neither of whose interests are exactly aligned either).

We should therefore expect the parameters of any funding scheme to be exploited in the interest of TEI staff and management.⁶ The exploitation can arise in the design of courses, the quality of courses, and the choice and emolument of staff. We should also expect that this tendency would be most apparent where the level of funding was designed to cover the bulk of institutional costs, because this removes the risk that strategies designed to provide greater perquisites to staff and management will result in embarrassing and public examination of the finances and practices of the institution.⁷ For example, an obvious strategy to adopt in a world of base viability funding would be to set unreasonably low enrolment limits on courses, claiming that this was required to protect quality, when, in fact, it might have been designed to reduce staff workloads.

Public funding and competition

Competition requires that customers choose from among alternative suppliers. In the university context, services are funded by a mix of government Student Component funding per student, student fee payments and other sources of income. Categories of Student Component funding are (very crudely) based on historical costs of supplying teaching and research services in different subject areas. Competition is fostered by students being able to bring their tuition fees and Student Component funding with them to the institution they choose. Public research-specific funding is still sufficiently limited as to provide only muted incentives for universities because they still draw on Student Component funding and student fees to undertake many of their research activities.

Evaluating the Performance-Based Research Fund

Aggregate student funding is limited by the amount of the direct government subsidy and what is essentially a fee cap that requires government approval. This limits competition since it limits the advantages to the university of ‘doing something different’, reduces rewards from good performance and weakens the incentives for universities to focus on their actual and potential customers.

Governance

Asymmetric information issues are more acute in services, and rendered more important by there being no effective ownership interest in New Zealand TEIs that can focus governance on the cash or social surplus delivered by the institution. The councils of TEIs are large and diffuse in membership, including having substantial staff and student representation. The best that can be said of them is that some balance may be obtained as a result of competing private interest agendas being pursued at the council table. Neither the council nor the management and staff have a direct interest in the generation of a budget surplus.

The situation is compounded by the absence of a hard bankruptcy constraint because of government ownership. Staff, management and council members believe, and recent experience suggests, the government will bail out institutions in which bad management creates a major financial or quality problem. In these circumstances, a large financial or social surplus is simply not in the interest of the staff and management of these institutions.⁸ Even surpluses that are otherwise required to preserve institutional viability (e.g. provision for depreciation are vulnerable to the short-term exigencies preferred by staff, management and students (who generally weight expenditure on the current cohort of students more heavily than may be optimal for the institution’s long-term reputation).

Endogenous costs

The difficulty in assessing the quality of services and the limitations of university governance structures affects the interpretation that can be placed on the cost of providing these services. In particular, costs in publicly funded TEIs are endogenous, in that they expand to consume the revenue provided. This is particularly so because TEIs provide services and are human-capital-intensive institutions: commonly, nearly 60% of total cost is accounted for by direct personnel costs in universities, being somewhat lower in some other TEIs. Further, the larger is the fraction of institutional revenue provided directly by the government to institutions, the more acute the problem of endogenous costs becomes.

Endogenous costs mean institutional data provide a poor basis for inferring relative costs. Costs rise to meet the funding. Similarly, the structure of costs will be shaped by the structure of the funding: large grants for university capital expenditure will result in universities that have high quality buildings whether they need them or not. Of course, the smaller the share of government payments in total TEI revenue, and the greater the competition faced by TEIs, the less scope there is for staff and management to raise personnel costs and the less impact the structure of government funding has on the actual cost structure.

When government provides the bulk of revenue by direct funding, the amount and structure of the funding will be most important for the institutions. In the context of the political economy, it can be viewed as a form of cost-plus pricing.⁹ More specifically, at the level of the TEI, for example, an unbounded uniform payment per equivalent full-time student does pose problems since, even if it is set at a level that enables funding a certain quality of education, it will provide an incentive for courses providing lower quality but higher staff-management perquisites, providing they attract students. With open-ended funding, there remains an incentive to enrol (compete for) students; when funding is capped, competition is curtailed. In this latter case particularly, the monitoring that would be required to enforce specified quality standards would be prohibitively costly. The greater the ability of the customers to take their custom elsewhere, the lower is the need for external monitoring and the stronger are the incentives to compete on quality.

Performance measurement

The problems with the measurability of the quality of the services provided by TEIs and the efficiency of TEIs may be ameliorated when there are meaningful signals about performance.¹⁰ In practice, the scope for the pursuit of private interest by TEIs' staff, management and current students will be constrained by three factors: measures of research quality, the willingness of students to pay for the courses they take and competition between programmes of study (in which both research and student willingness to pay may be significant factors).

The quality of a research institution is indicated by the quality of its research outputs and this is derived from the quality and quantity of its staff. Research quality is imperfectly measured. It is signalled by the record of contributions to the research literature, but this is difficult to measure in any precise way. For research staff, some external market basis for the assessment of the quality of the research contribution is provided by the fact these staff participate in an international labour market. The credibility of

Evaluating the Performance-Based Research Fund

this signal is enhanced by the fact it rests on judgements about quality made by all institutions in the market.¹¹ There is no such obvious (imperfect) benchmark for the non-research institutions: these may therefore have more scope for the pursuit of the self-interest of management, staff and current students (particularly where volume input measures are used as an indicator of quality).

Competition, particularly competition for fee-paying students and research dollars, is extremely important in inducing tertiary institutions to focus in a cost-effective way on quality. Further, the higher the proportion of the total cost of their education that is paid by students, and the larger the proportion of funding that is generated by competition in research performance, the more important competition will be in disciplining the self-interested behaviour of current management, staff and students. It is difficult for a funding agency to duplicate the discipline of fee-paying students on institutions because its position as a third party accentuates the asymmetric information problem.

Benefits of competition between universities

Competition

In all industries, there is a balance between competition and cooperation that enhances economic and social performance. Competition is important because it means customers' demands must be addressed. Change results from attempts to meet their demands better. In a competitive environment, the 'competitors' should not be indifferent about their success or failure: they should benefit from the former and be accountable for the latter.

Cooperation is desirable when it arises from the attempts of competing firms to use comparative advantage or scale across multiple institutions to better meet consumers' needs. Cooperation is consistent with competition unless it is mandated by a process of central planning. The costs and benefits of central planning are well known (e.g. Stiglitz, 1994). The costs, in particular, reflect the difficulties in getting (unaccountable) suppliers interested in consumers' demands, the adoption of one view of the world when competing views and actions better accommodate the uncertainty associated with future states of the world and better serve the heterogeneous needs of consumers, and the limitations on the development of new technology that stem from rivalry between suppliers.

Cooperation induced by central planning

The alternative to competition is some form of central planning. Central planning presumes the quantity and quality of goods and services can be specified, and, once specified, delivered. However, with education services it is extraordinarily difficult for a third party to assess the quality and suitability for consumers of what has been delivered. Judgement of the services delivered by TEIs is best provided by the customers, particularly when they have alternative suppliers and can vote with their feet.

For tertiary education services, measurement by audit is unsatisfactory because of its necessary reliance on those elements of the service that are directly quantifiable, its reliance on information provided by the institutions, and because it must focus on process. No unique type or quality of educational experience can be inferred from process, since education is an experience good. Furthermore, in a central planning environment, heavy reliance on audit will tend to dictate, or enable the central planner to dictate, 'acceptable' approaches and courses of study. The dangers of this are illustrated by the fact that even in the current funding environment for tertiary education in New Zealand, the combination of public funding rule and private fee caps serves to limit the supply of educational opportunities that some consumers may have been willing to pay for.

Given that the empirical evidence does not provide strong support for the existence of meaningful economies of scale in tertiary education services, it is doubtful that central planning can be justified by a requirement to generate critical mass through coordination at the national level.¹² Hence, there would not seem to be a cost reason for agglomeration into (say) a model where there is one advanced-education/research university and a set of teaching institutions.¹³ Indeed, strong evidence supports the view that to succeed internationally, a 'national champion' firm requires that the national champion status is reached in a rivalrous market. The most prominent piece of empirical work in this area was conducted by Porter (1990), *The Competitive Advantage of Nations*. The study surveyed 10 developed economies with the evidence pointing to a strong positive link between the level of domestic competition and a nation's international competitiveness, contrary to the national champion's view.¹⁴ Porter (p. 117) concludes, "[w]e found ... few 'national champions', or firms with virtually unrivalled domestic positions, that were internationally competitive. Instead, more were uncompetitive though often heavily subsidised and protected". Thus, participating in the competitive global education market is desirable for New Zealand universities because it will enhance their performance in New Zealand, even with the current ownership and governance structures.

Evaluating the Performance-Based Research Fund

Another argument for central planning and the agglomeration of tertiary education services is that on the international scene, the New Zealand brand determines the image of education institutions, and poor performance by any subset of domestic institutions will upset this image. We question the validity of this proposition, but even if it held an element of truth, the quality of the education experience is paramount to long-term reputation and this is promoted by domestic competition and competition between New Zealand institutions that extends beyond New Zealand's shores.

Costs of ruling out competition between universities

Local monopoly power

Universities have local monopoly power, both by virtue of their locations and by virtue of the monopoly rights granted by government to operate certain franchises. Most firms with large consumer catchment areas have some localised monopoly power relating to the costs of consumers shopping in a different locality. In the university sector, this monopoly power is eroded by competition in a variety of forms, including distance education, the threat of entry from competing providers (new university campuses and other tertiary providers that develop degree programmes), and students' ability to take programmes at other institutions if firms exploit that monopoly power. This ability is enhanced by the lower communication and transport costs of modern economies.

Exemption from the Commerce Act 1986

If competition between the universities were ruled out by the government, this could be held to give universities an exemption from the Commerce Act 1986. The government has not actually ruled out competition or gone as far as to provide a section 20 statement to the Commerce Commission for an exemption from the Commerce Act's anti-trust provisions. But its public pronouncements on the costs of competition and the need for cooperation and coordination signal much the same thing in practice.

The problem with reducing competition in this way, is that a university is just like any other firm in suffering reductions in efficiency and imposing losses of welfare on society as a whole if it is not subject to the disciplines of competition.

The implications of funding regulations that essentially produce exemptions from the Commerce Act are illustrated by some universities already having been granted national monopoly franchises. The most obvious examples are the monopoly franchises in the offer of medicine and dentistry. This has two implications. First, in the absence of entry as a competitive threat, the University of Auckland and the University of Otago have much reduced incentives to compete with each other; it is better for them to reach agreements to divide the market (such as through agreed limitations on enrolment) and collect the rents associated with this franchise than to compete the rents away. Second, they may seek to exploit that local monopoly power by leveraging it into related programmes. For example, a refusal to accept students from medical intermediate programmes run by other universities might be held to constitute a welfare-reducing attempt to leverage local monopoly power.

Not-for-profit firms benefit from exploiting market power

Universities are not-for-profit institutions, which means they are not subject to taxation and have binding constraints on the distribution of profits that remove ‘maximising returns to shareholders’ as the modus operandi of the organisation. But, as Philipson and Posner (2001) have shown, the efficiency costs arising from an absence of competition between not-for-profit firms are just as large as the efficiency costs of reduced competition between for-profit firms.¹⁵

Not-for-profit institutions may seek rents because their governance structure has been captured by groups wishing to use it to subsidise certain types of consumer. Subsidies provide an alternative means of distributing excess profits.

Not-for-profit institutions may also seek returns above the competitive level because these profits are the source of perquisites and provide insulation that protects senior managers and council members from the damage to their reputation that would follow from large losses and government bailouts.

Uncertainty about the most productive paths for developing knowledge

Competitive decision making is particularly important in sectors where technology and knowledge are changing very rapidly. This is because it is not possible ex ante to be sure which path in the development of knowledge will yield the greatest benefits to society. Having only one research centre

Evaluating the Performance-Based Research Fund

in each field would place New Zealand at risk of intellectual stranding (investment in research that is not at the cutting edge of the field). Therefore, while some people might argue that New Zealand, being small, cannot afford to have competition between universities, it might alternatively be argued that it is precisely *because* New Zealand is small that there may be high costs associated with restrictions on competition between universities: without researchers at different universities being able to compete by pursuing different paths in the development of knowledge, we have a high risk of intellectual stranding.

Wasteful competition

Competition may produce similar research or teaching programmes at different institutions, but in a competitive tertiary environment, we would not expect this to represent duplication or constitute a waste of resources. This is because heterogeneous approaches to research or teaching may produce benefits associated with a greater range of new knowledge being developed or imparted, as well as better performance in quality and quantity, than if only one approach were permitted. Only when accountability is lacking and incentives for welfare-enhancing activities are weak will wasteful expenditures emerge.

Competition and incentives with the PBRF

The PBRF is, in essence, a fixed pool of funding divided among tertiary institutions based on certain measures of their research performance. By providing a significant source of income based on certain measures of performance, the PBRF provides a defined set of incentives for TEIs, which include a greater focus on measured research activities, an increase in externally funded research and larger numbers of postgraduate students, and achieving rankings (and thus funding) superior to those of the other eligible institutions.¹⁶

In this section, we consider the competitive mechanisms the PBRF generates and the incentives it provides.

Competition

While the PBRF is both a funding scheme and a means of placing greater accountability on universities, it is our view that the PBRF's primary impact will be in generating an increase in the quality and quantity of research and research-related teaching in New Zealand through enhanced competition between institutions.

Benefits of Competition between Universities

The impact of the PBRF at the institutional level will depend in part on the extent of competition across all aspects of university operations. The more competitive is the environment within which institutions function, the better attuned these institutions will be to the incentives provided by the funding scheme and the demands of students, and the greater impact any sharpening of incentives (such as through the PBRF) will have on the performance of institutions as a whole.

The incentives for universities to compete by focusing on those activities that contribute to the research performance measured by PBRF are increased by the:

- fixed pool, which means each university's funding is determined relative to other universities' performance, not against any absolute measures of performance;
- likelihood the government will provide any increases in tertiary funding through the PBRF, not through changes to Student Component funding; and
- ordinal ranking system that allows one institution to be identified as having the best research performance overall and in each discipline or nominated academic unit.

We can view the PBRF as a tournament where prizes attend the consequent rankings. The prizes take the form of reputation and direct funding. Tournaments are well known in the labour economics literature as useful competitive devices where an ordinal performance ranking is determinable, but quantification of the ranking margins is impossible (Lazear and Rosen, 1981). This is surely the case in the service sector more generally and in the tertiary education sector specifically.

The higher the prize and the more independent the institutions, the more intense will be the competition in a tournament and the more accurate will be the rankings that it provides because each institution has strong incentives to provide all information relevant to the assessment that drives the tournament. Tournaments are particularly useful when the institutions operate in a common environment and thus where the tournament rankings reflect the factors that go to generating good performance and not extraneous factors that vary across institutions. In the case of tertiary education this requirement is satisfied, thereby shoring up the rationale for using tournaments. Universities, in particular, find themselves in the same environment in the case of the PBRF.

Competition for research funding and competition for students are strongly complementary. Competition for graduate students and research

Evaluating the Performance-Based Research Fund

funding clearly interact: but the preparation of graduate students is also recognised in the design of, and should be enabled by resources put into, undergraduate degrees. Such competition does not rule out inter-university joint venture arrangements for projects that exploit universities' relative strengths; but where central government directives rule out competition for students, then the competitive benefits of the PBRF are likely to be muted.

The magnitude and nature of the prize will also affect the success of the PBRF. The effect of a significant level of prize on the focus on research is obvious. For the reputation 'prize' to be important nationally and, particularly, internationally, it is critical the exercise be credible by international standards. Assessing research output is an activity that, whether carried out for the PBRF or other purposes, is not quantifiable and rests very heavily on judgement. The efficacy of the scheme then depends on the pursuit of objectivity in assessment and, conceptually at least, requires independent assessors. The scheme's design should reflect these factors. We consider the PBRF could be improved in this respect by investing greater resources in employing subject experts with no connections to New Zealand researchers to assess the quality of outputs against international standards. But consideration of improvement requires an understanding of the objective.

The requirement that all academic staff be assessed has, by comparison with the system in the UK, resulted in less emphasis on buying star researchers and more emphasis on dealing with the non-performance in research of staff who are being paid to undertake research. Indeed the requirement to assess all academic staff focuses on a widespread problem in the New Zealand university sector – staff who are on contracts and teaching loads that enable research activity, but who can provide no tangible evidence of research productivity. We consider this emphasis particularly important in New Zealand, where the absence of a system of 'tenure' (such as that used in universities in Canada and the US) reduces the incentives for junior staff to focus on research and allows the possibility that staff may have long-term careers in the New Zealand universities without ever having undertaken any internationally credible research.

However, we consider the requirement to assess all staff is inappropriate in another sense: high-performing institutions may utilise specialisation allowing some staff to focus on research and graduate student supervision and others to focus on undergraduate teaching. But this in turn suggests the long-term competitive response to the PBRF will come through the stronger performance management of staff who are not research active. One component of this management may be the development of

differentiated contracts that allow heavier teaching loads for staff who demonstrate limited research potential or productivity.

A more balanced approach would focus on measuring the performance of universities as institutions, taking into account both teaching and research. This would reflect the fact high performance in schools and departments requires staff with various skills and abilities. Although subsequent assessment schemes that focus on teaching and learning might provide greater balance, we doubt this since centrally administered tournaments require ordinal judgements that are much more difficult to apply in teaching than research. In our view, student choices about the institution at which they wish to study and the programmes they wish to study are, at least in the medium term, likely to be more effective in assessing teaching quality than any externally administered assessment scheme.

The PBRF contains two elements of assessment that have the potential to drive competition in directions that may be inappropriate. The 'contribution to research environment' component is but an intermediate step in producing a school or department research output and should not be counted in assessing university performance. The 'peer esteem' component is particularly hard to justify because it opens the door wide for researchers to seek high rankings through the small social networks of researchers in New Zealand rather than relying simply on the ability to publish in quality international outlets as the sole proxy for peer esteem. Peer judgements are provided through the refereeing of publications but they are limited to the publication itself. Peer esteem thus may not provide any credible information additional to that provided by the publication record.

In providing funding incentives for universities to generate external support for research, the PBRF both increases competition between universities for the research contracts available through the Foundation for Research, Science and Technology, the Marsden Fund and the Health Research Council, and increases the incentives for universities to compete with Crown research institutes and private research organisations to obtain these funds. To the extent that cooperation between institutions increases the chances of making a successful bid, cooperation may be encouraged, but there are also strong incentives to compete to be the lead contractor and thus claim the PBRF income from 'booking' the base revenue for the contract.

Incentives and funding regimes

The incentives provided by the funding of all relevant activities combine to shape the activities of the institution as a whole. Higher, competitive

Evaluating the Performance-Based Research Fund

research funding, induces higher research performance in the sector, rendering the sector more internationally competitive and reducing any proclivity to offer courses that do not attract students, no matter what the institutional priorities of the staff.

Higher research funding also has the potential to resolve one of the most anomalous features of the current Student Component funding system, and the one that has provided the most perverse incentives in recent years. In effect, there are two types of TEI in New Zealand: those whose staff do research and those whose staff do not.¹⁷ Research-based TEIs have much higher costs of teaching than non-research TEIs, because they must provide their staff with time to do research as well as teach. However, the base levels of Student Component funding for different degrees make no allowance for these differences in the costs of teaching at research institutions.¹⁸

When the fee payable by the government is the same per degree across institutional types and high enough to allow some research, the non-research institutions have a free option in that they can engage in research and, if successful, enjoy benefits from that activity with no downside cost unless they are not successful and there is sunk investment in research.¹⁹ If they choose not to engage in research, they will expand student numbers to the extent that revenue is greater than variable costs, and this could lead to a proliferation of low-cost and low-quality courses. When there is little competition, the quality and cost of the programmes have limited checks.

Research institutions are less likely to engage in the pursuit of low-cost and low-quality courses for two reasons. First, it is unlikely that, after making substantial investment in developing a reputation in the research environment and in having that reputation recognised and codified through the PBRF, they would then risk the institution's reputation in the pursuit of low-quality teaching programmes. Second, with a substantial portion of their funding coming from research, research institutions are less directly affected by the incentives that are provided by Student Component funding. In a world with competition for substantial funding based on research performance, TEIs are under pressure to limit the diversity of courses offered as part of a process of limiting teaching loads to ensure staff have adequate time to focus on research and professional development.

Conclusion

The PBRF acts as a measure of performance. In particular, it is a measure of the extent to which universities have actually invested in the development

of research capacity and hold staff with substantial research time accountable for undertaking research. Because of its very substantial impact on both the reputation and the income of the universities, it has also provided a vehicle for intense competition. We have argued that competition between universities is necessary because of the general difficulty in assessing quality in service industries and the specific problems associated with the stakeholder governance structures and academic freedom of universities.

The PBRF has the benefit of basing assessments primarily on publication of research, for which the criteria for assessing quality are relatively well defined (by academic standards). The PBRF also has the advantage that, in requiring all academic staff to be assessed, it has promoted a balance of competition in addressing the issues created by research-inactive staff as well as focusing attention on the value of the most productive researchers. In our view, the intensity of the competition between universities generated by the PBRF is unlikely to lead to an overemphasis on research so long as there continues to be competition to attract students. But if competition for students is muted by a new funding regime, universities would rationally invest less in teaching and learning and focus their attention on maximising PBRF revenues. Thus, in an environment with a PBRF, the requirement that institutions compete to attract students to all their programmes provides an appropriate balance of incentives for managers of TEIs and this is true even when Student Component funding does not differentiate between students at research and non-research institutions.

Looking forward, we would suggest increasing the amount of PBRF funding so long as competition for students is maintained to continue to provide institutions with strong incentives to invest in the quality of teaching and learning. We also recommend abandoning assessments of peer esteem separate from that demonstrated by publications, and placing more emphasis on the assessments of internationally credible researchers who are not part of New Zealand researchers' social networks.

Finally, we suggest the positive impact of the PBRF will be enhanced if we continue to promote other aspects of the TEI environment that facilitate effective competition at home and internationally.

Notes

- 1 The authors acknowledge the helpful comments from the editors on an earlier draft of this chapter. The views expressed in this paper are those of the authors alone.
- 2 While some of these schemes require cooperation between institutions, this simply shifts the competition from the level of individual institutions to competition between coalitions.
- 3 For discussion of the implications of advances in communication for competition, see Evans and Quigley (2004).
- 4 Karel (2004) examines the implications of services for competition.
- 5 An experience good is a product or service where product characteristics such as quality or price are difficult to observe in advance, but these characteristics can be ascertained on consumption. The concept is originally due to Nelson (1970). It is applicable to tertiary education.
- 6 Indeed, there is generally some purpose in the design of funding schemes that anticipates or requires managerial response. For example, any scheme designed to implement cost control must take into account the nature of the service and the presence of asymmetric information, thereby anticipating the response of management, staff and students.
- 7 Institutions that have small amounts of government funding will be more responsive to the consumer demand elements of these institutions' incomes.
- 8 The reputational effect on managers of insolvency does provide some incentive to avoid insolvency.
- 9 For a discussion of the rationale for, and the place of, state aid, see Karel (2005).
- 10 Signals about quality of input are commonly relied on in services, since the amount and quality of outputs is not easily quantifiable.
- 11 In the larger academic labour markets of Australia, Canada, the UK and the US, a much greater tradition than in New Zealand has developed of getting paid more by moving to another university, or at least obtaining offers that create the option to move to another university.
- 12 The empirical findings are inconclusive. When economies of scale are found the magnitude of them is typically small. Patterson (2000) concludes there are scale and scope economies but largely in smaller institutions.
- 13 Although, as we argue below, economies of scale estimation is likely to be confounded by the endogenous cost problem.
- 14 The 10 countries examined in Porter's study were: Denmark, Germany, Italy, Japan, Korea, Singapore, Sweden, Switzerland, the UK and the US.
- 15 We note that not-for-profit firms should not be confused with cooperative firms. While the cooperative, in certain circumstances, solves the market power problem, being not-for-profit does not. The absence of an interest in surplus

Benefits of Competition between Universities

from the organisation does not imply an absence of interest in exploiting market power settings.

- 16 Even before the PBRF's introduction, there was considerable incentive for universities to compete in raising external research contract income. Ministry of Education data shows that this form of income has increased substantially in recent years, with most of that increase coming from private sector sources (Ministry of Education, 2005).
- 17 For this discussion we can leave research participation as a choice of the institution.
- 18 Until the PBRF's introduction, there was some differentiation in the funding of the teaching of research-based TEIs through the so-called research top-ups. These differentials are being phased out as the PBRF is phased in – with the resulting savings redirected to the PBRF.
- 19 The downside cost will also be limited by the possibility of being bailed out by the government owner (bailouts come at a cost to managers, but the cost is less than that associated with a private firm's failure).

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Evaluating the Performance-Based Research Fund

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