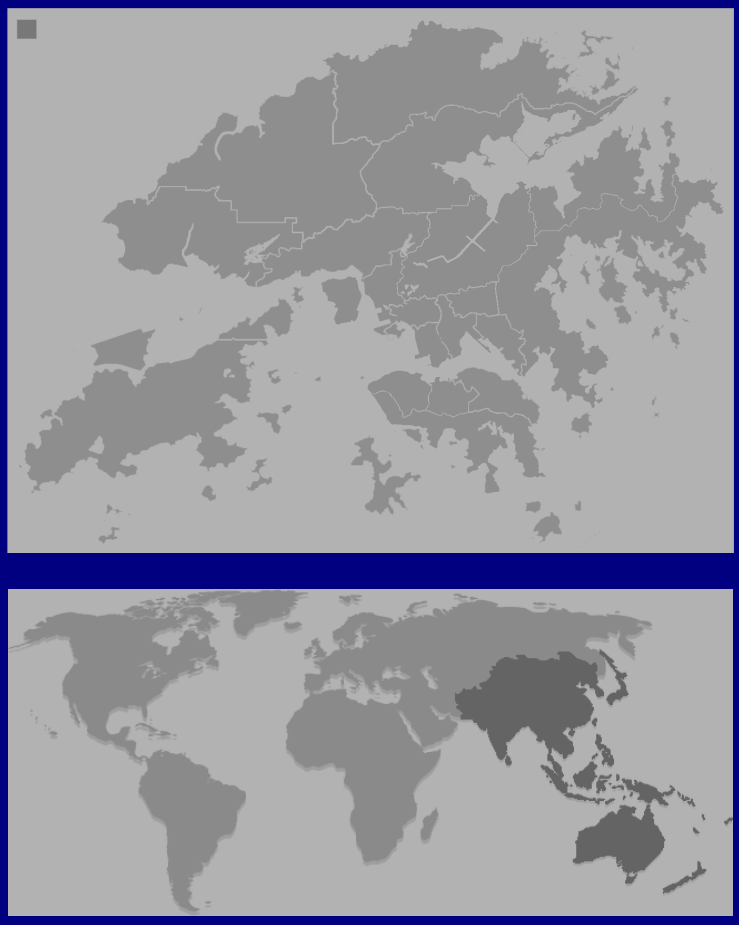
Hong Kong Higher Education Review (HER)
External Expert Report



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0. Introductory remarks

The consultant expresses warm and grateful thanks to the Higher Education Review Group, the University Grants Committee of Hong Kong, and especially to Mr Michael Stone, for providing the opportunity to undertake this work.

0.1 Coverage

The report responds to all of the issues listed in Appendix D to the consultancy contract, 'Issues to be covered by external experts' (see issues listed under the sub-headings in each section of this report). As mandated in the correspondence, the ordering of the items has been changed from Appendix D. The two 'General Issues' listed at the beginning of Appendix D are addressed in the final two sections.

The contract for the work specifies that 'The Consultant shall provide "helicopter views" on emerging issues in the higher education sector which will have an impact on the development of higher education in Australia. In the report for this purpose, the Consultant shall encompass the specific questions set out at Appendix D in the context of Australia'. In the correspondence concerning this consultancy, it was agreed that a more global scoping would also be provided. Accordingly, in each sub-section of this report the issues are addressed as follows, in sequence:

1) in terms of global overview;
2) (in most sub-sections) in terms of the position and perspective of Australian higher education;
3) (in some sub-sections) an additional 'Personal note' where the consultant comments on the Australian case, or the Hong Kong case, or remarks on matters difficult to forecast e.g. by pointing to the indeterminacy of key factors.

The consultant's own research and publishing is primarily in the domains of studies of globalisation, higher education and the knowledge economy, issues of innovation and creativity, higher education markets, and international and comparative education. Perhaps for this reason sections 1-2 and 4-5 of the report which focus on developments in knowledge and the knowledge economy, the global setting and internationalisation strategy are more data heavy than others. Arguably, this emphasis can be justified in terms of the contents of the consultancy brief. Higher education in Hong Kong, as in many nations, is increasingly focused on global drivers and strategies (for one recent discussion see Hvistendahl, 2009). Further, these sections of the report provide backdrop for the more specific discussions of government policy and institutional practices in sections 6-13 that follow.

0.2 Methods

The paper assumes that present broad trends in the policy settings will continue; which is not to say that paradigm breaks and other possibilities are excluded, merely that they are unknown. Thus for the purposes of the paper it is assumed that the

politics of low tax and constrained spending will be maintained in the Westminster democracies. The modernizing, quasi-corporate and performance-centred reforms associated with the New Public Management (NPM) will continue to work their way through institutions and national systems, albeit with some modifications. The trend to more outwardly focused and responsive institutions, engaged with communities and industry, will also continue. Likewise is also assumed that globalisation will continue to work its way through higher education and research.

The brief requires the consultant to read existing developments and trends in higher education in such a matter as to make judgements about the evolving environment and its possibilities and limits. Such is the task of all policy reviews. The exercise is inherently limited because while we can anticipate and guestimate the future we cannot forecast it with precision. The paper does not engage in statistical extrapolation across the issues. Given the complexity of the variables, the range of possible futures, and more generally, given the limits of probabilistic reasoning and statistical inference in the social sciences (Keynes, 1921); this would be of doubtful value. Numbers based simply on the extensions of present trends at best provide the comfort of a spurious precision (Le Bras, 2009; see below). Rather, the method used in this paper is that of *synthetic judgement*.

Any synthesis is partial. One chooses a particular angle, or a selected and managed plurality of angles, from which to illuminate the whole. Nevertheless the paper sets out to bring as broad as possible a set of phenomena into the frame, consistent with coherence. Inevitably in a paper of this length, covering a broad range of issues and resting on complex mutually interactive conclusions, judgements appear schematic and under-evidenced. But most of them have support in the author's published and forthcoming work, for example the theorisations in Marginson, 2006; 2007a; 2007b; 2008a and Marginson, et al., 2009). The paper is also informed by contact with higher education in Australasia, North America, UK/Europe and East and Southeast Asia; participation in policy forums in Australia and at OECD, and more briefly in some other nations; and some knowledge of the policy, empirical and theoretical literatures.

0. 3 Present uncertainties

At present the indeterminacy that attends any forward looking exercise is heightened by the global financial crisis, whose medium term effects on the capacity of individual higher education systems and institutions; the social and economic demand for education; the global flows of people, knowledge, ideas, communications, technologies capital; and the expectations of governments, are as yet unknown. One suspects that we are in the early stages of the playing out of the effects of a prolonged recession in the systems and institutions of higher education and research.

In an essay in the OECD volume *Higher Education to 2030: Volume 1, Demography*, Le Bras (2009) makes the point that while forecasters tend to extrapolate trends as if future developments will be linear, future developments are never so neat. The future, like the past, will be punctuated by breaks and disequilibria and 'numerous turning points' (p. 20). He adds that major turning points in areas such as demography – and, we can add, patterns in the social uses of higher education and in the production and

dissemination of knowledge - are slow to occur, tend to have long lasting effects, and are often triggered by political and economic factors such as recessions and wars. It is likely the present recession will be a 'major turning point'. As higher education relates to most social sectors, it will be affected in multiple unpredictable ways. Nevertheless most higher education institutions can be expected to continue through the crisis, especially research universities which, while by no means unchanging, have exhibited a high level of stability over time in response to external shocks. We can expect that institutions will maintain core activities in teaching, research and service; and retain much the same organizational forms into the early post-crisis period. In these respects they appear more stable than some other social sectors. Fraught with uncertainty though it is, the Review process – and it is to be hoped, the exercise of producing this paper – are activities that are worth conducting.

1. Knowledge

- *What will be trends for changes in the generation and creation of new knowledge? What will be the impact of these changes on delivery of knowledge (i.e. teaching)? What will be the impact of these changes of the organization of universities? Are there academic fields likely to lose their place in universities, either wholly or in part?*

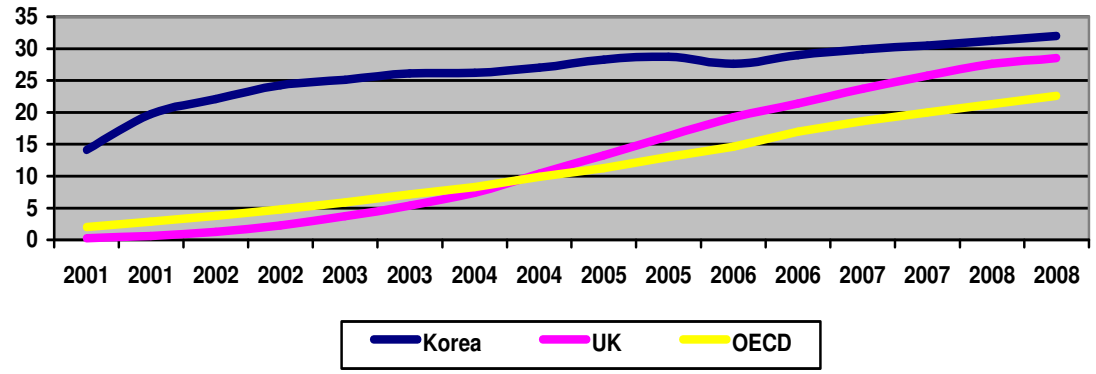
1.1 Global overview

Developments in the creation, dissemination and uses of knowledge and their interface with innovation in industry, government and civil society are the most dynamic and influential environmental factor to consider. These touch not only research and the content of teaching, but also, through the knowledge/knowledge systems/communication interfaces, the methods of teaching and the connections between higher education and external players. As knowledge and innovation become central to more and more social sites, the importance of capabilities in dissemination and knowledge transfer/exchange will further rise. There have been a several developments in the policy options in relation to knowledge and research, all likely to become increasingly significant in the next period.

Broad role of higher education in innovation. The now universal focus on innovation in economic policy has brought the role of higher education more into the centre of the economic policy picture (Scott, 2009), which is not to say that its role is confined to economic effects. This new centrality of the sector in relation to a larger role of knowledge highlights its work not only in discovery research – where higher education remains by far the most important site in most nations and has increased its relative importance in a slight majority of OECD countries since the year 2000 (OECD, 2008a, Vol. 1, p. 77) - but in five areas all told (pp. 73-76): the building of new knowledge and the continuing capacity to create knowledge; the diffusion of knowledge both in relation to the global knowledge system and through interactions with users, including industry and government (impact or knowledge transfer); the diffusion of knowledge and information about research into the larger civic culture; the

maintenance, reproduction and upgrading and continuous testing of knowledge through disciplinary communities, libraries and data bases; and the creation of human capabilities in relation to creativity and research through research training. 'Embodied in the notion of a "knowledge society" is also the idea that the number of knowledgeable actors should – and will – increase' (Scott, 2009, p. 59). All these areas of activity constitute public goods in part, in that they are only ever partly supported in competitive markets and require at least some public or philanthropic funding to be carried out at optimum levels. All of these areas also constitute potential competitive advantages for national systems and individual institutions and are therefore strategically significant. Between 2000 and 2005 higher education R&D expenditure grew by 7 per cent per annum, exceeding the growth rate of both GDP and of R&D as a whole (OECD, 2008a, Vol. 1, p. 78)

Figure1. **Broadband access as a proportion of the population (%), 2001-2008**



Source: OECD, 2009

Growth of open source knowledge and the dissemination of codified academic knowledge through the Internet. Internet connectivity is growing at a remarkable rate. In 2003 10.7 per cent of UK households had broadband access; four years later in 2007 the figure was 56.7 per cent. In Korea broadband reached a remarkable 94.1 per cent of households in 2007. In terms of individuals, broadband connectivity rose from 2.0 per cent in the OECD region as a whole in the second quarter of 2001 to 22.6 per cent in the fourth quarter of 2008 (see Figure 1) (OECD, 2009). Across the developed world there is a trend to convergence in broadband access indicating the formation of a common global network of common extensity. The number of websites rose from less than 10 million in 2000, to 236 million in May 2009 (netcraft, 2009). These developments transform not only the scope for the instant dissemination of knowledge, ideas and information but also, to the extent that creativity is fostered in communicative synchronous association, the creation of knowledge (Peters, et al., 2009). The effects on higher education are two fold. First, worldwide access to the codified academic knowledge produced in journals is facilitated, for all of those who can afford the price of subscriptions. Personnel working in the principal research universities in wealthier nations routinely have open access to this body of knowledge, and this has hastened the centralization and standardization of disciplinary knowledge in the one global language, English; and access to . Secondly and more

importantly, there is a vastly expanded potential for open source knowledge that circulates outside the formal academic knowledge system of journals and monographs. Direct communication of papers and data near synchronous with discovery and creation is often two years or more ahead of journal publication. It is certain that open source knowledge flows have expanded much more quickly than formal academic knowledge. Between 1995 and 2005 the world's annual number of published journal papers in science (including social science) rose from 564,645 to 709,541, an increase of 25.7 per cent at the modest annual rate of increase of 2.3 per cent (NSB, 2009). Coupled with the rate of growth of web connectivity this suggests that open source knowledge is playing an increasingly important role.

The webometrics (2009) data on university web traffic, which include presence in the academic journal system and also web volume, provide a measure that accounts for the dissemination of both formal and informal knowledge. See Table 1.

Table 1. **Top 20 Asia-Pacific universities in webometrics ranking, January 2009**

	university	nation	world ranking
1	Australian National U	Australia	48
2	U of Tokyo	Japan	52
3	National Taiwan U	Taiwan China	55
4	Kyoto U	Japan	78
5	Monash U	Australia	111
6	Peking U	China	117
7	U of New South Wales	Australia	120
8	U of Hong Kong	Hong Kong China	121
9	U of Sydney	Australia	125
10	U of Queensland	Australia	127
11	U of Melbourne	Australia	130
12	National U of Singapore	Singapore	135
13	Keio U	Japan	152
14	Chinese U of Hong Kong	Hong Kong China	156
15	Hebrew U of Jerusalem	Israel	169
16	National Chiao Tung U	Taiwan China	179
17	Seoul National U	Korea	182
18	Korea Advanced Institute of S&T	Korea	204
19	Technion Israel Institute of Technology	Israel	208
20	Nagoya U	Japan	216

Source: webometrics, 2009

The OECD uses the term 'open science' to capture the more transparent and rapid dissemination of formal and informal knowledge. Corporate and governmental institutions source innovations directly tapping into the world bank of open science. In the old policy model of R&D it was assumed that the key problem was 'the failure to commercialise public science' (OECD, 2008a, Vol 2, p. 103). In Europe this was known as the 'European paradox' and European universities were contrasted unfavourably with their American equivalents. A similar line of reasoning developed in the UK, Canada and Australia. It was believed that research-based innovations

proceeded by a linear progression from discovery to application. If the linear chain could be shaped more closely by the commercial user and financial investment was protected by intellectual property, the system would be made more efficient.

In the emerging new model it is assumed basic research - academically controlled curiosity-driven work - is the principal ultimate source of innovations; that the benefits of inquiry are largely unpredictable; that while discovery research is university centred innovation is a different matter and the linear chain from discovery to application is only one possible pathway to commercial innovation; that innovation can be instigated from anywhere in the complex of R&D activity and prior to, during and after discovery (OECD, 2008a, Vol. 2, p. 103); and the rate of innovation is maximised when there is free access to scientific knowledge. The new model both embraces and encourages the open dissemination of knowledge, emphasizing that knowledge is sourced on a global basis rather than in single national science systems. It notes the crucial importance for nations of broad-based skills in understanding (and therefore also creating), interpreting and applying research-based knowledge, bringing to the fore the importance of human capacity development by universities. Universities provide the skills that enable industry to access and utilise open science. For example university research training is the ultimate source of the executive capacity within industry to make advanced judgements about S&T.

The new model also downgrades the role of IPRs especially within universities themselves. Intellectual property-bound research continue to be important in some sectors, especially those like pharmaceutical research and parts of electronics where the business science potentials are well defined, but IPRs block or slow dissemination and often function as an obstacle to innovation overall. The new paradigm is summed up by the OECD (2008). The OECD notes that the notions of ‘European paradox’ or ‘Canadian paradox’ are misguided. Far from being the paragon of commercial science the USA leads on only one commercialisation indicator (p. 103) though it is exceptionally strong in basic research. What earlier policy saw as a failure to commercialise public science is typical of innovation and knowledge. ‘A common criticism of commercialization is it takes at best a restricted view of the nature of innovation, and of the role of universities in innovation processes’ (p. 120).

> It has become clear that there are complex trade-offs between providing incentives for universities and firms to develop intellectual property rights (IPRs) versus creating incentive for diffusion of knowledge across the economy… The idea that stronger IPR [Intellectual Property Right] regimes for universities will strengthen commercialisation of university knowledge and research results has been in focus in OECD countries in recent years… countries have developed national guidelines on licensing, data collection systems and strong incentive structures to promote the commercialisation of public research… Even though the policy issue of stronger IPR for universities is prominent, it contains a number of problems, however. The most important of these is that commercialisation requires secrecy in the interests of appropriating the benefits of knowledge, whereas universities may play a stronger role in the economy by diffusing and divulging results. It should be remembered that IPRs raise the cost of knowledge to users, while an important policy objective might be to lower the

> costs of knowledge use to industry. Open science, such as collaboration, informal contacts between academics and businesses, attending academic conferences and using scientific literature, can also be used to transfer knowledge from the public sector to the private sector… very few universities worldwide … have successfully been able to generate revenues from patents and commercialising inventions, partly because a very small proportion of research results are commercially patentable (OECD, 2008a, Vol. 2, pp. 102-103).
>
> Tether and colleagues (2005) remind us that the public science base is funded by national taxpayers and so it is not unreasonable to expect this research to be relevant to national business interests. Indeed, these authors argue that 'currently, a significant proportion of the science budget is spent on activities which contribute to a global pool of knowledge which is unlikely to be commercialised in the UK' (Tether *et al.*, 2005:1 p. 107). However, it should be remembered that all countries have the benefit of tapping into the global pool of knowledge and utilising and commercialising knowledge developed around the world. This suggests the policy focus should also be directed towards improving access to open science. Moreover, other forms of knowledge transfer are important, and D'Este and Patel (2007: p. 1310) argue that government policy has been too focused on patenting and spin-off activity, and this can obscure 'other types of university-industry interactions that have a much less visible economic pay-off, but can be equally (or even more) important, both in terms of frequency and economic impact' (OECD, 2008a, Vol. 2, p. 105).

It is also argued that university's efforts to secure IPR returns from scientific discovery and application, in their own interest as institutions, including technology transfer officers and other institution-based brokers, can be misguided. Universities rarely have the capacity to maintain long patent chains on a comprehensive basis, and few such university controlled IPRs actually generate lucrative returns. Even in the USA where commercial R&D activity is larger than elsewhere this activity remains a minor share of total research financing within universities. For the most part IPR-protected science is better left to venture capital, commercial R&D and product development. Universities are inherently less efficient than market forces in commercialising ideas. Nor is the commercial driver essential to the motivation of scientific discovery itself, including the evolution of socially and economically useful science. Rather than block the market actors, universities should focus on their own distinctive contributions in knowledge creation and interpreting, dissemination and research training.

The rise of open science in conjunction with open source knowledge flows does not simply constitute a swing of the pendulum from market to public sector science. The new open science is not so much non-market or a reassertion of earlier collegial modes of research largely cut off from society, as *post-market* and grounded in a highly networked and interactive environment. Commercial user ties are more important than in the high collegial era, links to industry are active in many domains and creative people alive to financing opportunities; but even more important in driving inquiry are links between the producers of knowledge across borders, reasserting the autonomy of scientific work without collapsing its transparency.

Further, 'open science', in the context also of open source knowledge flows in a networked world, alters the relationship between research universities and the societies and economies in which they sit. Facilitated by the spread of both scientific and advanced general literacies, the fruits of university research flow directly into most social sectors. The relationship between university and other sectors is less mediated than it was, reducing the distance from society and again enhancing the centrality of communications, transparency and the potentials for knowledge transfer and exchange. This is a great change in the role of higher education with consequences that will unfold in the next period. Peter Scott summarises the change:

> … the combined effects of the emergence of a truly knowledge society and the advance of globalisation, appears to offer higher education and research systems unparalleled opportunities. The primary responsibilities of higher education institutions and research organisations are no longer confined to the replication of academic (and, less honourably, social) elites, the training or higher professional experts and the production of basic science (and disinterested scholarship). Important as these responsibilities are they still require mediation- through the careers of graduates, the application of science and the transfer of technology, and the popularisation of academic knowledge within a wider intellectual culture. But in the knowledge society (and, still more, under conditions of globalisation) higher education and research institutions are projected into the front line of social and economic development, as the layers of mediation which once protected their role as – relatively – autonomous actors (and their particular organisational cultures) are peeled away (Scott, 2009, p. 61).

Basic research. These are profound shifts with several consequences. One is the enhanced policy focus on basic research (as noted, academically controlled curiosity-driven work) whether shaped within disciplinary, cross-disciplinary, problem solving or industry associated research settings. There are a number of drivers of this.

First and most fundamental is the new innovation paradigm itself and the belated recognition by national governments (Japan was the first to do so) that American success in industry innovation derives at least in part from its stellar research capacity which has been built by public science funding since world war two. American entrepreneurial science rests on the back of this basic research capacity rather than being a substitute for it, or the next stage of development of it. It is no coincidence that US universities are as dominant or even more dominant in global research as American industry is dominant in innovation in knowledge-intensive sectors. The study by Shattock and colleagues of the role of higher education and research in regional development in Europe finds that the most entrepreneurial universities are also those that are strongest in basic research. 'The triple helix of government-industry-university support is most evident in large research-intensive institutions (whether "comprehensive" or specialist)' (Shattock, 2009b, p. 36).

Second, global university rankings have gained tremendous salience in a short time (see section 4). The most authoritative rankings are in research, where internationally

comparative data are most readily standardized and embody the most prestigious aspect of higher education. University performance in the research rankings is determined primarily by the quantity and quality of journal publication and citations, including the presence of highly cited researchers. Basic research is a more fecund source of publication than are applied and commercial research. Building a position in the global research rankings largely boils down to building capacity in basic research.

Third, on the supply side, by definition basic research of global significance is the form of activity most conducive to self-determining intellectual work. It is both a highly attractive practice for university faculty and one that external agents cannot ever fully comprehend or control. Paradoxically, the evolution of unmediated and transparent relations between universities and the rest of the world renders this more important. Basic research is both the one activity that cannot be reduced to external drivers and the one that positions the creator within the university in a position of maximum status and influence, its potentials enhanced in the open science and open source settings.

The Shanghai Jiao Tong University ranking helped to bring bibliometric data on research and citations, including impact measures and judgements about the centrality and quality of field-specific journals, into the policy mainstream. The field of data compilation involves two major publishing houses and researchers in many nations specializing in science indicators. The Higher Education Evaluation and Accreditation Council of Taiwan (HEEACT, 2009) has developed a comprehensive collection based on various short-term and medium-term indicators of research publication, citation and researcher quality measures. Perhaps the most useful summary data on research performance are those prepared by Leiden University in the Netherlands. These are discussed in detail in section 4 below.

Creativity: Concurrent with the stronger emphasis on basic research and the more direct and less mediated diffusion of communicable ideas is the ubiquitous policy emphasis on fostering creativity and creative capacity, not only research itself but in all research-affected and knowledge intensive domains from science and the arts to design, organization and entrepreneurship (Peters et al., 2009). Policy in Singapore is a good example of the broad application of the creativity theme (Kong, et al., 2006). The economic policy assumption is that a social culture in which creativity is valued provides optimum conditions for innovation in business and industry, and is more likely to utilise local talent and attract high quality human capital from abroad.

Diffusion and impact: With more and more activity now sustained within and motored by the networked communicative environment; and with the growth of the number of people with advanced training and their spread through industry sectors; practices of knowledge diffusion, transfer and exchange with non-higher education partners have moved from a marginal to a central role in the work of higher education institutions. This area can be expected to develop markedly in future years, driven by the needs for status and partnerships; the positive synergies between networks, external impact and opportunities for funding; the likely evolution of government performance indicators in many countries; and the growing number of personnel specializing in the augmentation of external links and in broking relationships. Diffusion takes place not just in conventional academic publishing and open source

posting on the internet but within research cooperation, through applications for funding, via consultancies and joint ventures and especially through informal channels in public policy, professional, business and other circles. Public discussion in the media and especially specialised web-based media will increase rapidly. It is not just a matter of spreading knowledge but in spreading ways of thinking and solving problems and also making available and spreading the electronic library skills of searching for, interpreting and managing information. The last group of functions can be expected to also climb in importance.

Impact and transfer/exchange are nevertheless difficult to define and measure. Thought is being given to this problem in many countries. We can expect to see the emergence of techniques for measuring connectivity and impact as defined in quantitative terms. Qualitative measures are more elusive, and self-measures of impact are contaminated by marketing objectives. These factors pose the possibility of external panels or reference group, possibly as a branch of quality audit, with a supervisory or monitoring role in relation to the external relationships of institutions.

Research concentration strategies: The new ubiquity of knowledge-related functions creates two contrary dynamics in higher education systems. One is to encourage an across-the-board approach to lifting research outputs. Some of the strong research systems foster this broad-based capacity via funding mechanisms. For example the bulk of support for research in Denmark and the Netherlands is through the general operating grants that also cover teaching and both these university systems perform well in research counts and exhibit strong leading institutions. These systems also apply funding for project, fellowships and centres of excellence but these schemes are not the principal means of supporting research. The contrary dynamic is to focus more selectively on excellence and seek a concentration of research capability, resources and outcomes, either through targeted distributions and submission based competition, new centres of excellence, or the slower effects of funding mechanisms over time. The British Research Assessment Exercise (RAE) distributions combined elements of both approaches. The RAE was a merit based distribution of institutional rather than project-based research support. The funding was on a large scale – after the 2001 RAE the UK disbursed a total of USD $8.6 billion (Salmi, 2009a, p. 89) - with marked implications for the concentration of resources on an institutional basis, over time fostering universities with a broad range of high calibre research activities. That is, it has fostered both discipline-based and institutional concentrations. The RAE also created a transfer market. Institutions augmented their RAE performance by attracting mobile researchers with strong records, and this further augmented concentration on an institutional basis. The system appears to have been relatively efficient, in that UK universities have sustained what is in global terms a stellar research performance, in the top third of UK universities, at moderate levels of public investment.

Overall, the most important transformative trend of the last decade has been a more widespread concentration of research activities in particular institutions. This is encouraged by university rankings in which a nation's global research standing is primarily understood in terms of the league table position of its universities rather than its disciplines, even though data on both are available. A number of nations have put

in place funding and system management strategies designed to secure or elevate 'world class universities' where research performance is the most important single element of being 'world class' (SJTUIHE, 2009). Often the goal – whether implicit or explicit – is to achieve universities that have the status and influence of the principal American and British institutions. In *The Challenge of Establishing World Class Universities* (Salmi, 2009a, especially pp. 71-91)) the World Bank argues that a key characteristic of such institutions is their leading role in research and the integral role of research-based insights and sensibilities in pedagogy at all levels. Such institutions settle substantial funding on research, include large numbers of world leading researchers, have a stable funding base and 'have the confidence to set their own agenda'. The creation of such universities can proceed by upgrading or merging individual institutions or by creating new ones. China has the 211 Project and the 985 Project. Between 2007 and 2012 Denmark is allocating a USD $1.9 billion Globalisation Fund to research universities on a competitive basis. France is engaged in a large scale regroupment program designed to create ten regional centres of excellence out of existing universities and research organizations at a cost of 5 billion euros. The German Excellence Initiative involves ten research-intensive universities, 40 graduate schools and 30 clusters of excellence that take in universities and the private sector at a cost of USD $2.3 billion. Korea's USD $1.17 billion Brain Korea program involves 11 universities. Taiwan China has a USD $400 million Development Plan for University Research Excellence. However, 'instant results are impossible. Achieving the goals of creating a culture of excellence and achieving high-quality outputs take many years and sustained commitment on the part of the entire constituency of the institution, internal and external' (p. 72).

The World Bank also cautions that the goal is not possible or appropriate in some societies. Where the world standing of the university exceeds the relative opportunities for graduates it could contribute to brain drain problems (p. 73).

Knowledge city strategies: As the last point suggests, the focus on world class universities is often pursued in abstraction from the context in which institutions sit. A more place-nuanced strategy is that of university-city development, or knowledge cities, which combines research concentration and capacity building, policies designed to secure a net inflow of talent, attention to infrastructure and conditions of work, the formation of 'creative precincts' housing institutions of high endeavour across a range of fields and encouraging public/private synergies, and an emphasis on communications and dissemination functions. 'In principle, any place with an Internet connection can participate in a knowledge-based global economy. However, innovation continues to cluster in specific regions and the tendency for innovation to coalesce is becoming more pronounced' (OECD, 2007, p. 41; see also Florida, 2005). The holy grail is to become an innovation zone of global importance. In all such zones, research universities play a crucial role. It by no means follows that all strong research universities secure innovation zone status for their surrounding city and region. World class universities are a necessary but not sufficient condition. But it is easier for policy makers to take concrete steps towards stellar universities than to foster capital-heavy competitive business sectors at the forefront of innovation.

Most larger cities in the developed world have implemented or are considering a variant of the knowledge city approach, which is a subset of regional development strategy. In Singapore the city-university and regional strategy is also the global strategy. Not all higher education institutions are positioned to join such strategies. Those best placed to pursue city-university synergies have premises located close to city centres, and enjoy prestige as the leading or one of the leading universities in the metropolis. 'A more favourable industrial mix with high value-added activities is closely linked to the capacity of metro-regions to concentrate R&D activities and generate innovation', argues the OECD (OECD, 2007a, p. 59). 'Post-industrial' knowledge economies 'may favour large agglomerations in a way that was not so true of industrial economies which need more expansive production sites. In fields such as high-tech and scientific manufacturing, media, finance, cultural and fashion activities 'there are advantages in both clustering and in global access to knowledge' (p. 60). Knowledge-intensive activities gain from the concentration of diverse knowledge workers. Firms and workers 'come constantly into communication with each other in ways that help to unleash diverse innovative energies. Numerous studies have shown that this process of communication is a critical factor in the generation of new ideas, sensitivities, and insights' (p. 295). Here the relationship between global effectiveness and local productivity is not either/or. All else being equal, universities that are globally engaged can serve their localities better. Conversely universities flourish best in open regions/cities which welcome outsiders. Whereas low taxes encourage inward flows of financial capital, and entrepreneurship, it is often better services that attract creative people: 'A good and attractive environment may not be an alternative to economic success but may rather contribute to it; as in the knowledge-based economy, highly qualified professionals with scarce skills can choose where to live from among different cities' (p. 20).

Longer term shaping effects of the research mission: The history of American higher education suggests that over time a large scale focus on building research capacity tends to transform the character of universities. In *The Uses of the University* (2001) Clark Kerr described the earlier stages of the process at the University of California Berkeley, and in her article 'The University of California at Berkeley: An emerging global research university', Ma (2008) describes the further stages of the process, especially the accumulating effects of funding from the National Institutes of Health and the National Science Foundation . Not only did the prestige of research and research-active faculty lift within the institution, partly eclipsing the teaching mission, the orientation of the university shifted from a predominantly local one to one in which the global research role was often dominant. All else being equal those universities in East and Southeast Asian and Western Europe engaged in research build-up will become more autonomous in relation to local constituencies and national regulation; and their disciplinary cultures will become more self-determining and globally referenced. A growth of local networking and knowledge transfer functions might counter the mission shift. It is more likely that while all external ties will become more intensive, the ties to the global knowledge system will augment more than others.

If so, these universities undergoing research build-up will become sharper examples of a more general trend in the internal cultures of research universities. Roger King

notes that high speed synchronous global communication furthers the propensity of scientists and scholars for networked and mostly non-government supported collaboration and the continuous circulation of knowledge. National citizenship often plays a minor role in shaping the flows of knowledge. The primary forces at work are curiosity, problem solving, imagination and ambition. These readily cross borders. The moves to a more global science are driven by researchers not governments and primarily reflect person-to-person cooperation. Nationally-vectored collaboration and resource sharing in big science remains a factor but typically constitutes a small minority of total projects (King, 2009a; 2009b). This decisively limits the capacity of national governments to place firm boundaries around national science systems (see also the discussion on partial 'disembedding' from national policy in section 15 below) This means that an essentially quarantined science community, like that of the Soviet Union prior to 1990, is not longer feasible. Though scientists continue to vary in the extent to which they collaborate across borders (see section 5 below), and in the degree to which they reference their own nationals in preference to others; and though national research funding, incentives and priority setting remain highly influential in research behaviours; all national science policy and system management must now be constructed within the environment of open science and with an eye to positioning and effectiveness within the global glows of knowledge.

This suggests the semi-independent faculty cultures that were always inherent in the American research university – notwithstanding the early creation of an executive presidency – is becoming one of the core features of strong research universities in this period. This development is by no means the norm in higher education as a whole; and it can collide with the desire of most governments to shape the national system according to national goals; but it is now difficult to see how any university could function for long at the cutting edge of global science without sustaining semi-independent research groups. In this and other respects the 'Emerging Global Model' (Mohrman, et al., 2008) is an American model but the logics at work are more than those of US national interest or institutional isomorphism: they are suggested by the character of knowledge and communications in this period . One of the questions at issue here is the extent to which liberal discovery cultures are dependent on not just academic freedom and partial university autonomy from government but a liberal civil order. It is likely that liberal faculty cultures can coexist with a lesser level of liberty in the society as a whole – historically, this has often been the case; from time to time one of the pre-twentieth century missions of the university what that of island of liberal culture, though that role was not universal. On the other hand given the new centrality of higher education and knowledge in human affairs and the 'thick' networks now joined to the university, it is unlikely that a liberal culture within the major universities could be prevented from securing liberalising effects in civil society as a whole.

Changes in fields and disciplinarity: it is a by-word of the times that the role of large team cross-disciplinary research formations has markedly increased, and that this is joined to the trend towards greater social and economic relevance in research, for example in work on the great common problems such as climate change, land use, water and urban organisation. Often this work crosses national borders. Likewise 'super-fields' such as nanotechnology that have grown out of disciplinary synergies are said to be the wave of the future in scientific inquiry. Identification of the trends to

globalisation, greater openness and cross-disciplinarity is often also joined to the claim that in research disciplinary boundaries are 'dissolving' (for example Nowotny, 2001). It is true that large-scale and international collaborative work is growing (NSB, 2009); multiple disciplines are typically involved in problem solving work with economic, ecological and social dimensions; and fields are constantly evolving and from time to time hybrid fields develop. It does not follow that the disciplines as such are dissolving – the virtue of cross-disciplinary work often lies in the fact that more than one distinctive way of thinking is brought to bear on the common problem - or that a majority of research work is likely to be multi-disciplinary in future. While from time to time particular institutions may configure the fields of study so as to alter orthodox boundaries and achieve particular multi-disciplinary arrangements, there is no solid empirical basis for general claims about the dissolution of the disciplines.

Teaching is another matter. There appears to be a long term world-wide trend towards reduction in the specific and designated role of core science, social science and humanities disciplines in first degree teaching; whether through enhancement of the role of professional programs, notably via business studies programs; or the evolution of more general cross-disciplinary and foundation programs in some institutions. It is likely that an increasing number of first degree teaching programs will be organised on the basis of larger field groupings (for example all physical sciences together; or sociology, demography, anthropology and political science together); and that many teachers at first degree level will be required to have a broader intellectual range than in the past. However these trends should not be overstated. Orthodox disciplinary formation remains the norm in many institutions. Further, the fact that in the research literature the field and sub-field (as well as new hybrid) groupings remain strong, ensures that these continue as points of reference in the design of teaching programs, though those programs themselves might appear to be increasingly generic. In other words disciplinary knowledge remains foundational to teaching.

It is very difficult to forecast the likely future growth or decline of disciplines and discipline cultures whether in teaching or research. Of the trends of the last two decade, it seems more likely that the life sciences will continue to grow in relative importance than business studies will continue on its upward trajectory. In order to secure competitive advantage some business programs (particularly in the research intensive universities) may move to more explicitly admit to their unit configuration older social sciences such as psychology; though no doubt others will continue the main trend of the last period, fragmentation into vocational sub-specializations. Now that digitally-based skills of information and communications have become widely generalized in the workforce, the academic disciplines and among young people themselves; the scope for specific teaching and research programs in information technology/ computing has been reduced, though not eliminated. In teaching business systems can be expected to remain an important component of business studies; and information processing is likely to become part of all vocational disciplines. Communications; which sits at the intersection between hardware and software design, social systems, global studies, language and image, and has the potential to inculcate generic and creative skills of very wide application; might be more important as a 'superfield' or as an umbrella in the manner of business studies.

1.2 Australia

Australia's stance on the contemporary policy issues in relation to knowledge:
In relation to developments in knowledge, the Australian higher education system exhibits only some of the newer trends that have emerged in developed nations. Australia is touched by the same secular phenomena – the growing centrality of universities via their role in innovation; the tremendous expansion of the Internet and networked connectivity, and the consequent flows of knowledge (Australian university personnel are good travellers and active global publishers); the talk about creative precincts and knowledge cities; the growing emphasis of universities on knowledge dissemination and networking. However, in the ten years after the mid 1990s there were few substantial policy developments in the sector. Arguably, the most dynamic and formative area was not research and knowledge, it was education exports. National policy has now returned to an active stance (Cutler, 2008; Bradley, 2008) but internationally common issues such as augmented investment in basic research, research concentration, differential institutional missions, and more active national engagement in global competition for high skill research labour are yet to be explored.

Between 1969 and 2006 the proportion of Australian university research classified as 'basic' fell from 76.7 per cent to 49.6 per cent (ABS, 2008); a shift largely engineered by the policy settings which over time have encouraged industry-focused work and commercialization, for example through the Cooperative Research Centre program (see below). There has been one substantial policy initiative to augment basic research in the last twenty years. Following the Backing Australia's Ability package in 2001 the funding for national competitive research grant schemes was doubled over the next half decade. However the effects of this increase have now been exhausted, in that the success rate for Australian Research Council Discovery Grants, which are the principal means for supporting basic research outside the medical sciences, have fallen back to 20 per cent which was the level prior to the introduction of the Backing Australia's Ability package. In the absence of current policy or public discussion around the questions of strengthening of basic research, and globally competitive high performing research universities, Australia diverges sharply from much (though not all) of OECD Europe; and China, Singapore, Taiwan China, Korea and Japan.

The contemporary issues have, however, been floated on the margins of policy. For example in Annex 6 of its 2008 review of the national innovation system, designated the Cutler report after its chair Terry Cutler, the review committee stated as follows:

> *Competitor Countries*
> Many of our major competitors have made substantial commitments to basic research capability recently and see this as being fundamental to their prosperity in the 21st Century. At the same time, they are developing novel ways to adapt to the changing circumstances of scientific endeavour including engaging in an unprecedented level of global competition for talent. The United States has employed a strategy of virtual multi-hub, multi-institution collaborations to support mega research projects through the National Science Foundation, National Institutes of Health and the Department of Energy. Japan has invested in 10 year

> support to a number of high priority research areas based around leading scientists. India and China have also made large investments to achieve rapid advances in the quality of their fundamental research capacity. China has moved within the last decade to transform many areas of science from a third world state to leading edge Institutes based around major investments in training and by attracting a cadre of top Chinese researchers from western countries. They have supplemented their efforts with the involvement of the Chinese scientific diaspora around the world.
>
> If Australia does not maintain strength in basic research in key areas we will lose our international standing, we will not be a player in the emerging areas of science that are so important for innovation, and we will not be able to attract and train the top level of young scientists from around the world so adept at working across disciplines and in developing new technologies. Our capacity to innovate depends upon a solid platform of enabling knowledge and technologies. A weakening of that platform over time will have serious consequences for our international standing and our national prosperity (Cutler, 2008, Annex 6, pp. 12-13).

However, to date there has been no take up of this argument in terms of new policy. Within Australia global university rankings are read less in terms of the implications for Australian research standing than in terms of the implications for Australian standing in the international education export market (see sections 4-5 below).

The force of the OECD's critique of the IPR focus in policy on university research has also yet to be felt in Australia. In March 2007 the federal government's Productivity Commission, generally regarded as 'dry' in economic policy terms, argued for a change of approach in much the same terms as the OECD:

> Universities' core role remains the provision of teaching and the dissemination of higher quality, openly disseminated, basic research. Even where universities undertake research that has practical applications, it is the transfer, diffusion and utilization of such knowledge and technology that matters in terms of community well-being. Commercialization is just one way of achieving this. The policy framework for universities should encourage them to select the transfer pathway that maximizes the overall community benefits, which will only sometimes favour commercialization for financial gains (Productivity Commission, 2007, p. xxiii).

The Commission also made the argument that the public funding of university commercialisation of R&D can lead to crowding out of potential R&D in industry Productivity Commission, 2007, p. xvi-xxiii). Similar views were expressed in the course of the Cutler review. So far there has been little change in policy approaches.

Funding and programs: Prior to the formation of the Unified National System in 1988, encompassing both the pre-1988 universities and the former colleges of advanced education, all Australian universities were supported for research activity through the funding of teaching places. All designated universities were expected to

carry out comprehensive basic research and this expectation had been factored into the formation of all new universities opened in the pre-1988 period. However when the Unified System was formed grants per student were reduced by 10-15 per cent, varying by institution; and with the formation of the Australian Research Councill (ARC) the principal basis of research support was shifted into project and centre funding. The newly designated universities were never funded for the formation of capacity in basic research in the manner of their predecessors, and were encouraged to pursue applied, industry-focused and commercial research agendas. In the outcome all public universities are designated and marketed as comprehensive research universities, and all have doctoral programs, but only about half sustain a research mission genuinely comprehensive across disciplines and fields. This has led to doubts about the capacity of some institutions to provide doctoral education of high quality; and required some institutions to focus on large scope cross-disciplinary research programs in order to maximize the potential for applications and funding partners. While this encourages dexterity in cross-disciplinary matters, and provides apparent support for ideologies about interdisciplinarity as the collapse of orthodox disciplines, such institutions have to feed off the stronger research institutions and other parts of global science for core disciplinary knowledge and the recruitment of personnel. Inevitably they are handicapped in their intellectual depth and range.

The capacity of teaching-related funding to support research time has been sharply eroded in the last two decades: the average student-staff ratio has risen from 14 to 1 in the early 1990s to 20 to 1 today (DEEWR, 2009). One effect has been the creation of larger groupings in first degree teaching, encouraging meta-disciplinary approaches in both teaching programs and academic organization. More than half of all Australian universities have formed large scale super-faculties (e.g. Business, Law, Social Science and Education together) and/or moved to establish multi-disciplinary or single profession-based schools in place of discipline based departments. This is consistent with more holistic and problem-based approaches to professional training. However, these trends are by no means uniform.

Research is now supported by two kinds of funding. First, competitive grants awarded by the Australia Research Council (ARC) and the National Health and Medical Research Council (NHMRC). These bodies together distributed about USD $733 million in 2008 in the form of funding for projects, fellowships and centres of excellence. Some of the programs encourage international and industry collaboration, and some are targeted to particular areas of research reckoned to be of national priority, but all allocate research activity on the basis of academic merit as determined in peer review. The second type of funding is performance related block grants. Institutions have a degree of discretion in the detailed allocations. These include the Institutional Grants Scheme which in 2008 allocated USD $205 million in differential funding to institutions on the basis of research performance (the only element in the Australian system that resembles the RAE allocations but on a much smaller scale); the Research Training Scheme (USD $390 million) which supports postgraduate research degree training; USD $78 million in scholarships for research students; and Research Infrastructure Block Grants (USD $139 million) which provide part of the cost of the research infrastructure needs associated with government funded research projects. Postgraduate research support includes a component for 330 new

scholarships per annum for international research students. There is also a small scheme designed to attract high calibre international researchers at advanced levels of salary and research support, formerly designated Federation Fellowships and now designated Australian Laureate Fellowships. There are 20 or less such awards per annum. International applicants are also eligible for Australian Research Council support under the mid career Future Research Fellowships which commence in 2010.

The principal means of securing industry/higher education collaboration in research has been the Cooperative Research Centres (CRCs) Program established in 1990. There have been ten selection rounds, resulting in 102 distinct and separate CRCs, not including renewals and new-from-existing funding. The federal government has invested approximately USD $2 billion, industry $1.5 billion, government end users $1.1 billion and the government research laboratory $0.7 billion. Over the course of its history the program has shifted focus towards commercialisation. A review of the CRCs associated with the Cutler Inquiry commented that:

> Analysis of the Program's objectives, selection criteria and guidelines reveals that the CRC Program has changed considerably since its inception. While cooperative research is still the underlying raison d'être for the Program, the early ideals of enhancing and expanding the nation's overall scientific and technological research capability to support broadly stated national objectives have been replaced by a heavy emphasis on supporting end-user driven research and research capable of producing commercial return. While the early guidelines looked for a balance between strategic pre-competitive research and shorter-term research leading directly to application or commercialisation, the later guidelines placed an absolute focus on commercialisation/utilisation of outcomes. This has been emphasised by more stringent requirements to demonstrate their IP management and commercialisation 'vehicles', with clear milestones and 'paths to adoption'. The early rounds required that the research itself be of high quality, but this has been less prominent in later rounds… The early rounds recognised the cooperative aspect of CRCs, but the later rounds emphasised end-users over research providers...
>
> These trends are consistent with the drive over the last 20 years to derive financial returns from commercialisation of intellectual property arising from publicly supported research – the current program objective and guidelines provide a framework for commercialisation of research from CRCs. However the Review notes the findings of two economic-impact studies of the CRC Program which have argued that the while the economic impact of the Program has been considerable, it has been primarily through end-user application of research rather than direct commercialisation. The Productivity Commission argued that the emphasis on commercial outcomes was less defensible from an economic efficiency perspective and more likely to result in research collaborations of a type that a firm or industry collective would undertake anyway. In any event, CRCs typically appear not to have the know-how and resources to be particularly good at commercialisation (with singular exceptions) (Cutler, 2008, Annexe on CRCs, pp. 2-3).

This argument again is consistent with the thrust of current OECD thinking (e.g. OECD, 2008a, Chapter 7), but Australian policy has yet to shift decisively in response to it.

The Cutler review: The Cutler (2008) review of the national innovation system was released in September 2008. It provides a valuable overview of many aspects of research and innovation in Australia. While is was less fully prepared and packaged as a policy paper than was its compatriot report by the Bradley panel on higher education (Bradley, 2008), it has more intellectual depth and coherence, unlike the Bradley report connecting to the larger global discussion of its themes. The Cutler review notes that Australian government expenditure on R&D as a proportion of GDP fell by almost a quarter between 1993-93 and 2007-2008 (pp. 63-66). This was more serious in view of the low level of private sector investment in R&D, continuing the long term pattern which follows from Australia's sectoral bias to low technology industries (p. 7) and the branch office character of a high proportion of the global companies operating in the country. The review panel noted that to effectively source international scientific and technological know-how Australia needed 'active domestic research in the cognate field' (p. 42). Emphasizing that the public good character of knowledge meant that public investment had an irreducible role to play (pp. 38-39), the Cutler report called for the full funding of all costs associated with federally funded research projects. It noted that universities were subsidizing federally funded research work from 'other revenue streams, including those intended to cover teaching costs' (p. 68).

> Notably this includes fee income from overseas students. Cross-subsidisation of research from teaching is not sustainable in the longer term, as inevitably a decline in the quality of student experience and outcomes will result. If international students do not receive full value for the fees they are paying, they will tend to choose other countries for their studies. In addition, there are many international market factors that can affect overseas student income that are independent of the research sector. A decline in overseas student income would, under the current funding system, play havoc with universities' research activities (Cutler, 2008, p. 68).

The report noted that the government had instigated a process to determine the full costs of research on an agreed basis, along the lines of the transparent costs mechanisms developed in the UK (p. 68). In addition the Cutler report argued for increased public funding so that by 2020 Australia would match the top quartile of OECD countries in public expenditure on R&D (p. xii). It recommended immediate additional expenditure of USD $1.5 billion by 2010. It emphasized the need for Australia to compete more effectively for global R&D talent along the lines of schemes in the UK, Germany, the Netherlands, Finland and Korea (pp. 22-23). It also proposed that the annual government stipend for doctoral students be increased by almost one quarter and that the standard doctorate should be extended by six months to four years in total (p. 77). On the role of universities in commercialisation, it found:

> Research commercialisation is not a core role for universities. Nevertheless, universities can play a vital role in the commercial process. In cases where the

> benefits of research are best achieved through commercial engagement, universities should, where possible, attempt to partner with appropriate stakeholders to achieve these goals. Such instances are in the minority and universities more commonly play a role of commercial significance through provision of vital research advancement, workforce training and substantial international links (Cutler, 2008, p. 67).

The Cutler report recommended that the existing tax concession for business-financed R&D, which has proven difficult to access, be replaced by a tax credit system which was expected to induce higher levels of R&D investment by small firms and induce more R&D expenditure on Australian soil. At the same time it argued for the removal of the previous requirement that the IP of the R&D should be Australian owned given the global nature of R&D (pp. 106-107).

2009 Australian government decisions: In the May 2009 budget the Australian government adopted some but not all of these proposals. It stopped short of those that challenged the core assumptions of existing research policy. The Cutler report's recommendations on changes to the R&D tax concession regime were implemented. The government agreed to full cost research funding but in the light of the global recession and the consequent reduction in government revenues, decided to phase this in over a six year period. This meant that in the interim dependence on income from international students to cover part of the costs of research would continue.

There were no additional monies for the research programs of the ARC and NHMRC. However, the government introduced a set of 'Superscience' initiatives in three fields of research: space and astronomy, marine and climate, and life science /bio-technology. It established a scheme for 100 new Science Fellowships and made a number of one off grants for programs and facilities in these fields. This was the budget's main augmentation of basic research capacity. Part of the increase in doctoral stipends was agreed but not the extension to four years. A parallel recommendation from the Bradley committee (concurrent with Cutler) for the introduction of 1000 research scholarships for international students was not supported. There were no new schemes to advance the global attractiveness of institutions. However, the government allocated funding to eight bids for research infrastructure as part of the allocations from its Education Investment Fund. The Superscience and infrastructure grants provided compensation for some but not all institutions for the failure to adopt Cutler's propositions on funding core capacity.

A small Collaborative Research Networks program was introduced to facilitate developmental cooperation between research intensive universities and others. The commercialisation focus of policy remained largely unchanged, though the CRC guidelines were broadened to include public good as a potential objective of research activity. A new Commonwealth Commercialisation Institute was created, to support research commercialisation, the early stage development of R&D companies, and collaborative activities between universities, and industry and end users.

Research specialisations within institutions: The Australian government provides just one institution with specialised research funding to enable an augmented mission

in research and doctoral training: the Australian National University (ANU). However, in some other institutions the continued and growing importance of research capacity and performance (for example, in relation to global university rankings) generates internal pressures to concentrate and augment research-strong areas .One expression of this is the growth of research-only academic posts. Between 1996 and 2008 the number of full-time equivalent (FTE) research only staff in Australian universities grew from 7757 to 12,455 (60.6 per cent) while total FTE staffing excluding casual labour grew from 72,703 to 86,624 (19.1 per cent). Nearly all of this growth in FTE research only staff took place after the year 2001. Table 2 lists the Australian universities with more than 200 FTE research only staff in 2008:

Table 2. **Research only staff in Australian universities, 2008. Universities with over 200 full-time equivalent staff (FTE) only**

University	FTE research only staff	FTE all academic staff *	research only staff share of total staff %
U Queensland	1414	5814	24.3
U Melbourne	1404	6274	22.4
Monash U	1268	6082	20.8
Australian National U	1250	3578	34.9
U Sydney	1069	5542	19.3
U New South Wales	890	4723	18.8
U Adelaide	682	2603	26.2
U Western Australia	672	3222	20.9
Queensland U Technology	353	3169	11.1
Griffith U	308	3010	10.2
U South Australia	284	2396	11.9
Flinders U	232	1644	14.1
La Trobe U	222	2457	9.0
Curtin U Technology	217	2775	7.8

* excludes casual staff
Source: DEEWR, 2009

1.3 Personal comment

Communications systems and potentials will drive much greater changes in research and scholarship. The Internet's potential for direct, immediate publishing, and the reputational and first move advantages to be gained from speedy publishing, are likely to ensure that direct publishing (if not synchronous posting) of results becomes dominant. Possibly, journal formats with 2-3 year publishing cycles will be no longer competitive. Electronic posting of monographs can also be expected to increase in importance if not become the dominant mode of monograph publishing. On a shorter cycle, universities will compete with each other in their capacity to generate and communicate 'just in time' research data. All of this will highlight the importance of both academic validation, and electronic publishing and data transparency. It is likely that university-based electronic publishing of new work will become a chief medium, constituting the return of the university press – though only some authoritative

research universities will play a key publishing role - and undermining the large firm global publishing oligopoly that has developed. University websites therefore will become still more significant, increasing expenditures on communication.

We will also see much greater use of synchronous data exchange and analysis. International collaboration for discussion, dissemination, research, writing and publishing will become dominant in many fields. Peter Scott also remarks on:

> The development of ever more sophisticated survey design and statistical analysis tools (of particular relevance to social scientists) and of powerful simulation and visualization tools (which have made natural scientists and engineers less dependent on experimental equipment, testing rigs and bench-work apparatus), the proliferation of e-journals (which has significantly reduced the spatial constraints on access), the growth of pre-prints (which has increased the velocity at which research findings can be disseminated, but may also have compromised their authoritative status… (Scott, 2009, p. 71).

Amid these developments it is likely that eventually orthodox copyright and patent regimes will be modified substantially. One can envisage a global copyright 'regime' that is closer to those traditional to China (where scholars receive status for the circulation of their works rather than royalties) and India (which free copying is the norm) than to American IPR practice. Indeed it is likely that changes in American practice itself will signify this. The Harvard Faculty of Arts and Science decision on the posting of and free access to the scholarly output of the faculty is an important early sign of an environment in which free circulation of text is the norm. In addition, because the Internet greatly expands the scope for both transparency and knowledge transfer, this enables 'thick' networking and direct dissemination with non-university agents. This kind of activity too will develop markedly, given the other trends propelling higher education towards greater engagement with outside agents.

2. Economic role of higher education

- *What is the economic impact of higher education (including knowledge transfer) on the society? Will the economic significance of university education change in the future? How will such changes impact on the economy?*

2.1 Global overview

Education, innovation and economic growth: The notion of the advanced economies as 'knowledge economies' is now accepted. The concept of knowledge economy is understood in such broad and diverse terms as to be largely meaningless; but among the characteristics of modern economies are that knowledge-based innovation and technological change are endemic and the role of tertiary educated labour is widespread and growing in relative terms. In the OECD nations in the two decades after 1983, employment in the agricultural sector fell by 4.6 per cent, and in the industrial or manufacturing sector fell by 6.5 per cent, while services employment

grew by 11 per cent. ‘Many of the services are knowledge intensive’ (OECD, 2008b, 36). Production in many services sectors is dependent on workers with a threshold level of general literacy and skills of problem solving, communications and computation that are enhanced in education.

In practical terms the connection between investment in higher or tertiary education and economic benefits seems to be a truism of contemporary policy. Until the onset of the global financial crisis the level of investment in tertiary education was increasing on a worldwide basis, though patterns were uneven. The total level of public and private investment in tertiary education was increasing in nearly all countries. In the majority of OECD countries the national priority given to investment in tertiary education was also rising. Between 1995 and 2005 the proportion of GDP allocated to public and private spending on tertiary education rose in 17 of the 24 OECD nations for which figures are available (OECD, 2008c, p. 237). More strikingly perhaps, expenditure per tertiary students increased in nearly all OECD nations in the decade after 1995 and by an average of 11 per cent across all OECD countries, suggesting that in many countries, rather than a trade-off between quantity and quality, the often dramatic growth in student numbers was accompanied by improved quality (p. 224).

The role of tertiary education in modernisation is clear-cut. It fosters skills of reflexive self-transformation and the capacity to survive and compete effectively. At the same time it provides a broad-based framework of opportunity and a post hoc explanation for social destinations which can be centred on the individual, while also balancing inequality in the market-place. These factors; which operate regardless of the extent to which education contributes to the economy; guarantee that higher education will continue to receive social and political support. Nevertheless there are compelling pressures to ground higher education in terms of economic policy; and there is no analytical consensus on relations between investment in education and research, and outcomes such as the rate of growth, and the public and private benefits.

Higher education has two kinds of economic effects, direct and indirect. Direct economic effects pertain to the creation of economic surplus through higher education and research, primarily in the form of business activity. This includes commercially produced vocational and training programs, international education in some countries, consultancy and revenues derived from Intellectual Property. Though encouraged by government policy settings in many nations; and by institutions themselves because of the need for revenues, these activities constitute a relatively minor part of higher education as a whole. Most research is not realized in Intellectual Property. Most teaching programs are subsidized by governments or free of tuition charges and the relationship between student and institution is primarily mediated by academic selection rather than price and market choice. Even in the USA where tuition charges are higher than in most nations, revenues from students rarely generate surplus. Despite this the commercial for-profit sector has grown in the last decade, and the for-profit University of Phoenix is now the largest private institution in the USA in terms of enrolments. In a small number of nations headed by Australia, New Zealand and the UK surplus from international education is significant (see section 5 below).

However the larger role of higher education in the economy pertains to the indirect effects, and herein lies the difficulty. The OECD argues that tertiary education contributes to social and economic development through four missions: the formation of human capital in teaching; the formation of knowledge; the dissemination and use of knowledge, primarily through publication and interactions with those who use knowledge; and the maintenance, storage and transmission of knowledge (OECD, 2008a, Vol. 1, p. 23). In all these functions its contribution to economic production and growth consists in the creation of inputs, resources and conditions for economic production financed by other actors in the private market sector, civil society and government. The indirect economic contribution of higher education thus depends on a large number of mediating variables: for example entrepreneurship, capital availability and flows and the willingness to invest in economic activity; the existence of opportunities for graduate employment commensurate with graduate potentials; work organization and the deployment of graduate labour in the workplace; the availability and adoption of new technologies and innovations in work organization; and the connectivity and outreach of higher education institutions and their specific programs, for example in the professions, into the community and economy.

The presence of these mediating factors is a key difficulty for policy as well as social science. The payoffs for economic outcomes are less clear because of the mediating factors. This stymies the capacity of governments to target investments in education and research to achieve particular ends. A further difficulty for policy is that most of these mediating factors are less amenable to policy intervention than is higher education. In attempting to strengthen the economic contribution of higher education there is a tendency to focus on the supply side; the production of graduates, and of science and technology; rather than tweaking the end users of education and research. There is a tendency to try to make the economic contribution of higher education as direct as possible (for the case of commercial science see Geiger & Sa, 2008) if only to secure more policy leverage .This is one reason for the popularity of systems based on market steering. However a bias to direct economic effects, or as close as possible to them, leads to a narrow definition of higher education's economic contribution and is unlikely to lead to optimum long-term outcomes overall.

Over the half century or so that studies of the relationship between education and economy have been conducted, it has become more apparent that the interactions are complex. There is a very large literature. Findings vary widely. A key limitation in many (but not all) such studies is that they screen out the role of mediating variables. They look for a direct statistical relation between education and the economy despite the fact that the real world relationship is anything but direct or linear. But policy continues to call up such data because of the need to guide large scale investment.

For the most part the relationship between education and growth is held to be positive. Further, investment in first degree tertiary education is seen as generating a private rate of return. The OECD finds that across the OECD countries, net wage premiums to degree holders, compared to upper secondary-only graduates, vary from 2 to 11 per cent (OECD, 2008a, Volume 1, p. 30). On the whole they are higher for women than for men, which might helps to explain the fact that in most countries the female participation rate is higher than the male participation rate. Private rates of return vary

from 4-15 per cent, and are highest in Australia, Ireland, Luxembourg, Portugal, Switzerland and the USA (p. 34). The relationships between investment in education and spill-overs to other individuals, and investment in education and externalities to all members of society, are less clear. The findings from studies on those topics are assumption dependent. A key difficulty is that both the private non financial returns, for example status and quality of life benefits, are incalculable. Many of the common social benefits also elude quantification, being public goods and by definition unable to secure a full presence through market mechanisms. However both the private non-monetary benefits; and the collective benefits derived from such factors as common literacy, common language and cultures, and education's contribution to social order and the effective workings of law, economy and polity; appear to be very important (for one discussion see McMahon, 2004; 2009).

Technology and innovation: In the literature, the evidence about the contribution of higher education to growth is particularly strong in one respect, via the mediating effects of technological innovation. 'Tertiary education is identified as important for the development of innovative research and the ability to acquire and adopt it' (OECD, 2008a, Vol. 1, p. 39). The secular trend to increased R&D intensity in most advanced nations has good support. In an early study Lichtenberg and Siegel looked at productivity growth for over two thousand US firms over 1972-1985. They found that the gross rate of return on company-funded R&D was about 35 percent, and that there was a high premium on the benefits of research classified as 'basic' rather than 'applied'. In a paper summarizing this area, the Australian Cutler report notes that:

> A recent survey by Wieser (2005) assesses the international evidence. He reports considerable variation in the estimated social rates of return on R&D, averaging 28 percent but ranging from 7 percent to 69 percent. Taking account of spillover effects, the average social rate of return to R&D is around 90 percent, with spillovers between industries more important than within industries. There are wide variations in rates of return across industries. Significantly, there is no consensus as to which industries yield the highest returns, i.e., there is no evidential basis for 'picking winners' in terms of R&D support. Evidence is found that the contribution of R&D to productivity growth has been declining over time. However, this is likely to be due to the ongoing problem of measuring innovation in ever growing service sectors. It is also found that the differences in returns to R&D across different countries are not large although the USA is an outlier with relatively high returns. This evidence is backed up in the Australian context by Productivity Commission (2007, p. 628) who report that the marginal rate of return to 'R&D elicited through public support' lies between 35 percent and 100 percent (Cutler, 2008, Annex 4, p. 2).

In a review of the economic benefits of publicly funded basic research Salter and Martin (2001) suggest there are benefits for private firms not captured by productivity measures. These include increasing the stock of useful knowledge; training skilled graduates; creating new scientific instrumentation and methodologies; forming networks and stimulating social interaction; increasing the capacity for scientific and technological problem-solving; and creating new firms. But some studies indicate that publicly supported R&D can crowd out private sector research. This finding shows up

more at the firm level than a higher level of aggregation; and is more common in studies conducted in the USA than elsewhere (Cutler, 2008, Annex 4, p. 3).

Graduate labour: The more problematic domain is the interface between graduates and the labour markets and occupations. Several broad-based trends in the labour market have implications for graduate output. First, until the recession demand for graduates was rising overall. Second, there was no clear-cut evidence that the growth of graduate numbers was leading either to a displacement of the labour market position of non graduates, a deterioration in the level of sophistication of graduate work, and a decline in the income earning advantages accruing to graduates (OECD, 2008a, Vol. 2, pp. 191-193). This suggests that the growth of graduate supply has been roughly commensurate with demand for graduates, though there is much scope for variation in the demand/supply relationship in particular nations, cities and regions, and industries and professions. Third, the demand for graduates appears to be associated with the expectation that graduates should possess a higher capacity in 'soft skills' than was the case with their predecessors (pp. 199-200). The fact that a large proportion of graduates in specific vocational fields end up working for all or part of their lifetimes in sectors and roles other than the ones in which they were trained highlights the needs for flexible graduates with both strong general education and developed soft skills. It appears that in many vocationally specific programs general education and soft skills are undervalued. Though there is some domain specific training in communications, problem solving and information and communications (ICT) use in almost every field this is not always made explicit.

Regional development: In many countries policy makers are also working on the contribution of higher education and research to regional development. The OECD has fostered a series of studies in this area (Puukka and Marmolejo, 2008), and it forms a growing strand of the research literature in higher education (e.g. Shattock, 2009b). Institutions contribute skilled graduates, strengthen regional innovation systems and supply social and cultural resources. A difficulty in modelling and monitoring the role of higher education in regions is that of leakage: normally, the bulk of research is directed elsewhere, often to the global discipline, and many graduates choose to work outside the region in which the institution is located. Nevertheless the aggregate economic contribution of institutions to regions can be considerable, especially when they are the only major higher education institution in the relevant city or region. For example in November 2008, James Cook University in North Queensland, Australia, a research intensive university of medium size, commissioned a study of the impact of the region on the two provincial centres in which its main campuses are located, Townsville and Cairns. It was estimated that the university contributed just under USD $300 million or 2 per cent of regional gross economic product. For every $1 million spent on running the university, another $1.14 million in activity was created. The university created the equivalent of 5438 full time jobs of which 1907 were the University's own employees and 3531 were regional spillovers from its activity. Students attending the University spent almost $100 million in the region (DS Enterprises Consultants, 2009). While studies commissioned by the institution themselves have limitations, and the larger indirect effects cannot be readily captured in this manner, quantification of the regional effects is a valuable process.

Outwardly focused institutions: In this period most policies designed to strengthen higher education's contribution to the economy are rightly focused on securing more outwardly focused, networked and responsive institutions. The focus on external relations has the potential to strengthen the mediating effects discussed above, for example through the involvement of employers and professions in institutional governance, and in an advisory role in relation to the curriculum; student work experience programs during the period of study mandated within the curriculum; effective graduate placement at work; effective socialization into the professions; and shifts in the balance of enrolments as a result of labour market trends; and research within a region that is targeted more effectively to industry and community needs.

Effects of the recession: The fact that education is not a primary direct driver of economic growth is confirmed by the global recession. There is no evidence of phenomena in the higher education sector that triggered this development. The questions that arise, rather are (1) what will be the effects of the crisis in higher education and research? and (2) what can be the contribution of education and research to recovery and the next wave of growth? It is too early to determine the international pattern of effects, or the potential of higher education as a medium of recovery and economic change. Evidence from some countries suggests that the recession is associated with growth in local international student numbers; and in the United States and Australia there also appears to be growth in international student numbers. However, decline in government revenues has forced reductions in public higher education budgets in the US. Breneman (2009) reports that 'in recent days… the states of Washington, Nevada, Texas, Oregon, Idaho and South Carolina have announced cuts in state appropriations to public colleges and universities ranging from 10 to 36 per cent, and few states, if any, will avoid such cuts'. Many American universities also report 'endowment losses of 25 per cent or more in 2008, as virtually all asset classes have fallen in value… it is also unclear whether major donors will be able or willing to continue to provide substantial new gifts at previous rates in the current climate' (p. 2). Zhou and Lin (2009) report in relation to China that the recession has exacerbated the graduate unemployment consequent on China's rapid expansion of tertiary education. It is estimated that 2 million graduates in 2009 will not find jobs. The government hopes to modify graduate unemployment through the effects of government stimulus spending, and an increase in the proportion of first degree graduates who go on to postgraduate study (pp. 3-4).

2.2 Australia

Policy position on education and the economy: In 1988 the Australian government introduced at new systems of student tuition charges in which the individual contribution to the cost of higher education places via the Higher Education Contribution Scheme (HECS) was fixed at an average of 20 per cent of costs. The 80/20 public/private split of costs was reckoned to correspond to the average ratio of public benefits to private benefits, though this claim was not grounded in published research. Subsequently individual student HECS charges were increased faster than the government contribution to the cost of places, accompanied by statements about the private benefits of university education. In 2007 government paid just 42 per cent

of the total cost of higher education compared to 86 per cent in 1986 (DEEWR, 2009); and the government contribution was only slightly higher than the proportion of the income of higher education institutions that was paid by local and international students. In 2009 the public share of the cost of student places varies by discipline from 16.5 per cent public in law and business studies, to 68.2 per cent public in medicine and dentistry. It is no longer claimed that this reflects the actual public/private split of benefits but there is no doubt that the substantial transfer of costs from government to students was secured politically with claims about the private benefits of higher education.

While the funding of local students is split between government and students all of the tuition costs of international education are met by the student. International student revenues constitute 14.9 per cent of the total income of Australian universities (DEEWR, 2009). However the export industry is much larger than this suggests. In 2008 international education in all sectors, higher education, vocational education, English language colleges and schools, generated total direct economic benefits of USD $10.2 billion per annum in the form of student spending on tuition, transport, accommodation, food, clothing and other living expenses. This makes education the third largest export sector in Australia after coal and iron ore. In a report on the economic contribution of the industry Access Economics (2009) found that in 2007-2008 it constituted USD $9.4 billion in exports and each student added an average of $19,281 to the Australian economy. International education created 16,240 jobs, about 30 per cent in the education sector. For every two students, one relative or friend visited Australia during the student's stay and this factor alone contributed just over $200 million to the economy. Australia generates the world's third largest level of export revenues for education, behind the USA and UK (Bashir, 2007). A feature of the economic contribution of education exports is the relatively high economic multiplier associated with it, as the intermediate goods involved in producing education are largely sourced from within Australia (Access Economics, 2009, p. 3).

Current economic policy rationales: The Australian government's *Review of Australian Higher Education* (Bradley, 2008) did not reach any judgements about the contribution of higher education to economic growth, or the balance of public and private benefits. It was strikingly free of any consideration of these matters. It did not attempt to ground its funding proposals in an economic policy rationale. However, as noted the Cutler (2008) report on the national innovation system included a discussion of the economic contribution of R&D and the public good character of knowledge. The Bradley made a specific recommendation to provide an extra USD $53 million per year for higher education in regional areas but it was proposed as compensation for higher costs of provision rather than as an investment in regional economies and societies. The government did not include this in the 2009 budget. Instead it undertook to develop 'a new and more logical basis' for the funding of region-related costs at some point in future (Australian government, 2009, p. 59).

A demand driven system? The Australian government's preferred approach to securing the relationship between higher education and the economy; and in particular the relationship between institutions and the labour market, has been to position the student as the regulator of that relationship. First, the government

supports the annual collection of data from institutions about graduate employment outcomes, and graduate's evaluation of the quality and relevance of their programs, in the Graduate Destination Survey (GDS, 2008) and the Course Experience Questionnaire. The government also endorses the participation of individual Australian institutions in the OECD's pilot program for the Assessment of Higher Education Learning Outcomes (AHELO). The AHELO project includes assessment of discipline based learning in the fields of engineering and economics; and assessment of generic skills; and the collection of data on labour market outcomes. It is assumed that the provision of data on the comparative performance of institutions and programs will inform students' choice of institution and career path; and that this in turn will encourage institutions to both improve quality and align their programs more closely to the needs of the labour market in order to increase their share of student demand. Second, in a further step in the installation of this approach, in the 2009 budget the government formally implemented a 'demand driven' or 'student centred' system in which institutions can enrol any number of local students on the basis of government subsidized places.

> From 2012, Australian public universities and the Batchelor Institute of Indigenous Tertiary Education will be funded for student places on the basis of student demand. The Government will fund a Commonwealth supported place for all undergraduate domestic students accepted into an eligible, accredited higher education course at a recognised public higher education provider. Universities will not be funded for places that they do not fill. The Student Learning Entitlement (SLE) currently imposes a lifetime limit of seven years of equivalent full time study for Commonwealth supported students. The SLE will be abolished from 2012 when the cap on the number of places that universities can offer will be removed. Transitional arrangements will operate in 2010 and 2011. During this period the cap on funding for over enrolments will be lifted from 5 per cent to 10 per cent and the funding floor for under enrolment will remain. This approach will allow a sensible, managed transition to the new system. It will ensure that institutions do not grow too quickly at the expense of quality. It will enable a period of adjustment and planning to occur (Australian government, 2009, p. 17).

It is assumed this will confer on students a greater freedom to move to the institution of their choice, and oblige institutions to tailor their offerings more closely to the needs of students. However, much depends on the supply response of institutions. It is unlikely that many will seek to maximize market share because the fixed rate of funding of government-subsidized places in most disciplines is below average costs. Further, in the case of institutions that are already over-subscribed, and see no need to expand enrolments, the move to student-centred funding does not qualitatively increase the buying power of the student-consumer. There 'exit' has no sanction.

3. Technology

- *How has and will technological advancement drive and facilitate changes in the higher education sector?*

3.1 Global overview

Global e-universities? In the second half of the 1990s there were high expectations for the future potential of online education. Many saw virtual universities as the wave of the future. Management theorist Peter Drucker (2000) declared that within 30 years bricks-and-mortar universities would be replaced by virtual universities. The delivery of educational programs via the Internet offered institutions the prospect of operating largely outside government regulation, cutting their teaching costs, by-passing academic staff by using ICT specialists to develop programs, and opening vast new markets for educational electric commerce. In many early imagining of e-learning the Internet had overcome the old need to situate and nuance programs in local, national and linguistic contexts. Many believed that standard programs would have no trouble securing acceptance if they were delivered under the brand and via the website of Yale or Oxford. e-University offered the prospect of a worldwide sale of branded degrees at whatever price the market would bear. For their part governments were attracted to the potential for the expansion of access and participation on the basis of low cost delivery of programs. Once the infrastructure was in place and the software was running the unit cost of each additional customer was negligible and there would be no need to build new classrooms as student numbers expand; all of this providing of course that the virtual educational product would be attractive in the market. Global agencies believed that e-Us could be the circuit breaker in the reproduction of educational under-development. If the communications infrastructure was in place, e-learning could meet the world's unmet demand for education of good quality at low unit cost, using public-private partnerships. This again offered e-learning business the prospect of vast new markets, this time in the creation of global public goods in nations that could never (it was asserted) meet the demands of educational modernization, and financing by the World Bank, the UN agencies and philanthropy.

The financial potential of e-Us peaked in the dot.com equity boom of the late 1990s in the United States. Universities and commercial interests collaborated to secure a position in what was seen as the emerging global market. Columbia University's Fathom was developed in association with 14 other universities, including the London School of Economics plus libraries and museums. NYU On-line secured an investment of $22 million. The US state of Maryland spent $40 million on the University of Maryland University College's distance education activities including UMUCOnline. State assistance was also provided by Virginia, Michigan and in the Western Governors project (Ryan and Stedman 2002, pp. 11 and 17). The UK government announced the UK e-University in February 2000 at a cost of 62 million sterling over 2001-2004. It was conceived as a joint venture between UK institutions and a private sector expected to provide further investment, to provide degrees to a primarily global market largely via the Internet. Awards were to be provided by individual universities not the UKeU. It was expected to recoup its public grant of £62

million by 2004. The enrolment target was 5600 students in the first year (Maslen, 2004). Cardean University was based on Carnegie Mellon, Stanford, the business schools of Columbia and the University of Chicago, and the London School of Economics. The initial investment was $100 million. Cardean's business strategy depended on high volume sales of management education to senior and middle-level executives and managers worldwide. It targeted both the individual and corporate markets, offering an MBA taught in six-week subjects and short programs of a few hours' duration. Cardean was in partnership with courseware developer UNext which had responsibilities for course content, teaching and marketing. Teaching staff were not provided by the participating universities. In mid 2001 Cardean signed a training deal with General Motors and UNext set up marketing offices in the Middle East and Korea with a branch in Singapore (Ryan and Stedman 2002, pp. 10-11).

However in the 1999-2000 dotcom crash the Internet education bubble burst. Online education initiatives were especially vulnerable because they had 'dramatically failed to deliver revenue' (Ryan and Stedman 2002, p. 3). Meanwhile it was also becoming clear that there were high start-up costs for communications systems, web platforms for student administration and teaching, curriculum software and marketing. Most important, student numbers were well below projections. One by one most of the e-Us were terminated. In late April 2004 The UK e-University effectively closed in April 2004: 900 students had enrolled in four years, compared to the target of 5600 after one year (Maslen, 2004). By September 2001 Cardean had laid off half its staff and run into accreditation problems. By 2004 its website was moribund. U21 Global stayed open but enrolment projections were revised downwards.

Why did the commercial e-Us fail? The first answer is that the problem was not online learning itself but the assumptions attending its early global forms. Online tertiary education tailored to particular markets has been successful. As early as 2003, there were 350,000 students in mostly vocational e-learning programs in the American domestic market. One provider was the University of Phoenix. The Phoenix online mode was relatively teaching intensive and high cost, different to the early global e-U business models. At the same time, the viability of online learning in selected vocational programs does not translate into the potential to substitute for all forms of face-to-face teaching as Drucker imagined. Thus while most doctoral universities use online components in face-to-face programs, and parallel online delivery is widely used, no universities or commercial providers have yet developed an online mode strong enough to genuinely replace face-to-face doctoral university programs. Studies of student attitudes persistently show that most students want organic interactions with teachers and other students via face-to-face delivery. The main exceptions are full time workers who need convenient access to part time learning, the Phoenix clients. The second answer is that courseware is a public good; and while credentials are a potential private good the exchange value of online degrees in the labour markets is low. Online programs are handicapped by perceptions that the degree has less status than a face-to-face program, even when offered by leading brands such as New York University. There is limited scope to develop commercial products. The subsequent evolution of the knowledge economy has reflected this. The more important development than commercial delivery of e-learning has been non-proprietary open source models and systems (OECD, 2005a, pp. 134-135). These

methods release the interactive potentials of online education more effectively than commercial learning systems. There is room for many forms of e-commerce in global communications but product development always drives towards service specificity and niche networks.

The third answer is that the early courseware and electronic pedagogies failed to take full advantage of the potentials of the new medium. Essentially these were adaptations based on conventional delivery with a lower level of interaction. Today 's students make much more sophisticated use of social networks and image making than does a large proportion of the online educational programs on offer. One suspects that we are in the early stages of development of online teaching and learning; and of hybrids between the online and the conventional; and in future forms of online learning and classrooms will develop that are more compelling.

Ongoing effects of technological change: Scott (2009, pp. 70-72) confirms that the 1990s assumptions about technology replacing traditional pedagogies have now collapsed and 'a much more nuanced assessment of the likely impact of technology has become the dominant view, a view that emphasizes the blending together of technology-enhanced student learning and traditional pedagogy' (p. 70). Even so this has transformative implications for academic and organisational practices. ICTs enables a more sophisticated and varied approach to team-based teaching and team-based learning, including new interdisciplinary opportunities. In conjunction with social communications they import a more interactive, visual and even subjective approach into imagining and learning. By valorising technical expertise and web design they weaken the boundaries between academic labour and support staff labour. As indicated in section 2 there is also a major impact on research. Meanwhile shared information systems in institutions have made possible the shift to more decentralised financial management and initiative, universal performance data that facilitate quality assurance and goal-based strategy and financial allocations (pp. 71-72).

One suspects though that the transformative effects in teaching and learning have so far been slower than the changes in organisational system and design in part because of the demographic weight of the over 50 year age group in the academic staff profile in many nations. The 'baby boom' generation of professors and lecturers was at the mid career stage when the Internet become to become widely used in higher education. When this group exits we can expect more rapid changes.

4. Global environment

- *What are the necessary components of internationalization, both within the universities themselves and from the government or society? Do some countries have inherent advantages not attainable by others- if so, what and why?*

- *How do the dimensions of collaboration and competition interact with each other in the context of internationalization, and how will they evolve?*

4.1 Global overview

Globalisation: Globalisation is associated with the growing mobility of people, ideas, messages, money and technologies in higher education and research; new forms of delivery of higher education; new strategies for global and local advantage; an 'arms race' in investments in innovation; and changes in the worldwide maps of comparative national capacity and standing, student enrolments and research. China is in the process of becoming the number two national knowledge economy in the world. More generally, the Asia-Pacific is becoming a zone of great importance in higher education and science and the most important field of new opportunity.

The *global* dimension of human actions refers to a worldwide or planetary spatiality; to spaces, systems, relations, elements, agents and identities constituting of, and constituted by, the world as a whole or large parts of the world. For example it includes the worldwide system of English-language research publication. The global dimension does not mean total or universal, i.e. everything. It does not necessarily include every national and local element, only those elements that are part of the constitution of the world as an integrated world. Thus *globalisation* refers to processes of convergence and integration on a world or large regional scale; whether in economic life, culture, politics, communications or knowledge. It means 'the widening, deepening and speeding up of world wide interconnectedness' (Held et al., 1999, p. 2). Whereas international relations may involve just two nations ('inter-national'), globalisation is a dynamic process that may involve many nations and draws the local, national and global dimensions together. This points to the objective distinction between globalisation, which refers to 'one planetness', and the bilateral or multilateral character of internationalisation in which the nation-state remains essentially unchanged. The effects of globalisation are not constant but variable over time and between different parts of the world. Here it is useful to distinguish between global convergence and global integration. Convergence means coming into proximity without blending into one system. With integration a single system is formed.

Globalisation has generated new kinds of local-global-national configurations. For example, it is associated with the partial 'disembedding' from the nation-state of higher education institutions that raise incomes offshore, establish campuses outside their nation, or seek accreditation from governments other than their own (Beerkens, 2004; Marginson and van der Wende, 2007; for further discussion see section 7). Globalisation is also associated with the growing potential of global public goods whose benefits extend beyond single nation-states, and in some cases constitute benefits for the world as a whole (Marginson, 2007b). Global ecological sustainability is one example of the latter; but in the global knowledge economy (k-economy) there is increasing scope for common global goods relating to communications, information and knowledge, such as the Internet itself, which transcends individual nation-states though in its local manifestations it is open to some national influence.

Much of what is distinctive about contemporary globalisation – which in this respect continues through the recession – derives from the creation of the world communicative environment in the 1990s. This was a moment in the human story of

extraordinary importance. In association with global trade and global financial coordination, global connectivity is sustaining far-reaching changes in all parts of life, especially sectors in which knowledge, information and globally-transferable and standardized skills are of paramount importance. Since the advent of the Internet the global, national and local dimensions of higher education - as in most institutional sectors - have been brought closer together (Rhoades and Marginson, 2002). Thus the global dimension of higher education is no longer a separated realm on the edge of normal business. International education and global research *are* normal business. International and national mission and resourcing have become intimately intertwined. The comparative international performance of higher education institutions in their education and innovation functions helps to shape the global competitiveness of cities and regions, especially in relation to human capital and to creative and entrepreneurial capacities. The causality flows both ways – the quality of system steering, and institutional culture, and the levels of government and private investment in higher education, together with the freedom of institutions to respond effectively and take initiatives on the global scale; determine the global potentials of higher education and thereby shape much of the local future.

Much of the activity that is changing higher education in Hong Kong is generated from outside the SAR. Many of the effects of higher education in Hong Kong play out beyond the SAR. The issue facing the Hong Kong system and its institutions is not whether to engage with the rest of the world but *how* to engage globally and to what strategic ends? How can Hong Kong higher education optimize its position on the global scale? How should it develop its global capacity? Where lie the comparative advantages of Hong Kong higher education? What are its contributions to the world?

In this more global era, nation-states, cities and regions are no less important, but their role is changing in some respects. In communications and knowledge flows, and to some extent also in political economy and culture, the world is converging on a global scale. In all countries, cross-border policy flows and international comparisons affect policy thinking and institutional strategies. Higher education institutions and their agents have many more direct dealings with the rest of the world than was the case, say, two decades ago. At the same time government and policy remain largely national and local in character (though meta-national regional system organization is growing in importance in Europe); and cultural distinctions have become more significant than before now that nations and institutions are more visible to each other, which has always been a primary consequence of globalisation (Bayly, 2004). In crucial ways, the relations between higher education institutions and the world continue to be mediated by national and regional government, directly through policies and regulation in relation to international matters; and indirectly, through the conditions of possibility, the incentives and the resources provided by government. This suggests two conclusions. First, responsibility for the development of global connectivity and impact of higher education in Hong Kong is shared by individual institutions and government. Second, higher education in Hong Kong will be more effective in the global environment to the extent that effective synergies develop between national policy and institutional strategy, in such a way that there is a win-win for the sector and for the nation and SAR as a whole. The most globally effective

higher education systems tend to exhibit such a synergy, whether they are small nations like Finland and Singapore or large nations like the United States.

Global competition and collaboration: Worldwide higher education is a complex field of potentials for collaboration and competition. Global competition is played out in two overlapping domains: knowledge and people mobility These are often designated 'markets', though the first is not an economic market in the conventional sense and its relationships are not always zero-sum. Competition in relation to knowledge and its institutional forms as manifest in research capacity, performance and reputation takes place alongside and embracing global collaboration, endemic in research and essential to the communicative character of the open source ecology in knowledge. At bottom both global competition and global collaboration heighten engagement and enhance the need for intercultural sensibilities and skills.

> Over the past two decades, tertiary education and intercultural skills have grown in importance. In this context, there is a growing demand from students and employers alike for tertiary qualifications that have a strong international component – both from the perspective of the curriculum content and exposure to different cultures that helps develop intercultural skills and competencies (OECD, 2008a. Vol. 2, p. 237).

Forms of global competition: Competition in relation to knowledge and its institutional forms takes the form of a status market rather than an orthodox business market (for analysis of status markets and how they work see e.g. Hirsch, 1976; Frank and Cook, 1995; Marginson, 2004). All universities in all nations, and the specialized research institutes and government laboratories in some countries, are affected by competition in this domain. Research universities have always been driven by desires for prestige. In worldwide competition between universities, in which American and European institutions currently determine the norms of the higher education sector, the most credible expression of prestige is standing in research, especially scientific research. In these institutions prestige as expressed in their standing in research is more important than financial bottom lines, though economic resources are one of the conditions of success in research. Though league tables and research output metrics evolved only recently, judgments about research-based reputation have a much longer history. Increasingly the common global measures of success such as the Shanghai Jiao Tong University rankings, and English language journal publication, are displacing nationally-based indicators as the primary measures; though only a few universities can do very well or ever expect to do very well in this form of global competition. The worldwide map of uneven research capacity and the role of global referencing and ranking in research are discussed further below in this section of the paper.

The second global competition is the competition for globally mobile persons. The more global era in higher education has been characterized by vigorous continuing growth in the annual cross-border traffic of students, researchers and other higher education personnel (Enders and de Weert, 2009). Generally, mobility is welcomed by nations and institutions. It is seen as a source of talent from abroad, and for home country nationals an opportunity to gain valuable perspective and experience, though

there is always the potential for brain drain. Net brain drain is an issue for most countries other than the USA (Marginson, 2008). But people cannot be stopped from leaving a national higher education system without decoupling the nation from the global innovation system. This is not an option. At the same time, the more a national system opens to incoming talent, the more it can compensate for outward movement. Despite this many nations impose barriers to inward movement. Mobility is uneven by nation and by academic category. Competition for globally mobile persons his occurs in two main zones of activity. The first and arguably much the most important is in relation to research labour. The second zone of activity is the commercial market in international education (the education export industry) which is a competition for full fee-paying students, market share and revenues. Unlike the global competition in relation to knowledge, this takes in some non-university and commercial private sector institutions as well as universities. The competition in full fee-paying first degree and Masters students includes the UK, Australia, New Zealand, the Malaysian private sector, some institutions in Singapore and China, plus some Masters programs in Europe. Some international students pay little or no fees, for example in Germany. In the United States research universities subsidize most of their cross-border students but some community colleges and private institutions charge surplus-generating fees. Where global competition for students affects research universities everywhere is the worldwide 'market' in doctoral education. All developed and many emerging national systems compete for good quality foreign doctoral students. This is primarily a scholarship-based competition rather than a fee-based competition.

The relationship between the two global competitions, in relation to knowledge and relation to personnel, is complex. The two competitions overlap but only in part. The point of overlap is the competition for strategically significant established researchers, post-doctoral researcher-scholars and high quality doctoral students. For major research intensive universities the strategic significance of this zone of global competition can hardly be overstated, though it has little or no significance in many other higher education institutions. The zone where there is little direct overlap is that of the education export market. Capacity and activity in relation to research, and capacity and activity in relation to full fee first degree and Masters students, are very distinct areas for policy intervention; the one driven by the dynamics of knowledge flows and status competition and the other driven by profitability. Both zones of activity contribute to institutional status but in separated areas. A reputation for corporate power is not the same as a reputation for knowledge power and stellar intellect. In the commercial part of the market in foreign students the focus is on quantity (absolute student numbers and relative market share). In the competition for research prestige and international doctoral students, the focus is on quality (relative position or ranking in the market) and on the quantity of quality (the volume of recognized research outputs and good doctoral students). Talent is all-important in the global competition over knowledge, because it is the condition for stellar research performance and university prestige; but talent in itself is irrelevant in the competition for revenues. What matters there is student satisfaction and the volume of sales.

Nevertheless there can be an interdependency between the two forms of competition. Revenues from the export market are used to finance research capacity. By building status good research performance helps institutions to attract international students,

even though research quality has no necessary relationship to teaching quality. Thus the interdependency takes the form of an exchange between status and revenues. The inter-dependency does not take the form of an exchange of status building effects. While research performance and prestige helps attract international students, the reverse does not apply: success in enrolling cross-border students and earning revenues from them has no necessary implications for research performance and prestige. Again, the important exception is the global doctoral market. Attracting high quality internationals students is one condition for global success in research; and global success in research directly feeds into attractiveness to international doctoral students, though their tuition and living costs still have to be subsidised. *Success in global doctoral competition is highly strategic, pressing many buttons at once. It is also a competition in which the level of subsidies required to secure effects is modest*, compared to the start up price of an export sector, or the price of investing in mature researchers, research teams and the infrastructures they require. By doing well in the global doctoral 'market' universities can secure cost effective global advantages. Investment in high quality international doctoral scholars has the added advantage of securing relatively long term human capacity building and reputation building effects.

Comparative national investment in higher education: The OECD's *Education at a Glance* (2008c) provides a useful comparison of national investment in education but one largely confined to the OECD member countries. Data for China and India are incomplete and there are none for Singapore. By putting the OECD data together with information from the World Bank on the macro-economy we can build an international comparison of resource levels in most of the leading higher education powers, though data for China are missing. Table 3 shows that the USA is much the largest investor in higher education, allocating USD $360 billion in 2005 in Purchasing Power Parity (PPP) terms. Japan spent $51 billion, Germany, Korea and India each $27 billion, France $26 billion, Canada $25 billion, the UK $21 billion. Australia spent $10 billion.

Since the mid 1990s, in many OECD nations there has been a marked increase in the proportion of investment derived from private sources. Australian higher education provides a spectacular example of the common trend. This change and some of its implications are discussed further in section 4.2.

Global referencing and ranking: The global networking of higher education institutions and systems, the enhanced cross-border engagement made possible by cheaper air travel, global academic mobility, the global character of the sciences, and the growing converges in national policy sets; all of these developments feed into imaginings of worldwide higher education as a single system; notwithstanding the heterogeneity of traditions and practices in education and research; the continuing national, cultural and linguistic differences and the partial barriers to mobility; and the unevenness in capacity and level of global engagement. This imagining of a single global system in turn has created favourable conditions for development of global institutional rankings and the rapid increase in their influence.

Table 3. **United States' GDP, GDP per head, spending on tertiary education, leading researchers and research universities, compared to the next ten OECD nations on spending (above line) and the five largest nations in population (below line)**

	population	GDP in PPP terms	GDP per capita PPP	share of GDP to tertiary education	spending on tertiary education PPP (est.)	Thomson-ISI 'HiCi' researchers	research universities in Shanghai Jiao Tong University ranking		
	2005	2005	2005	2005	2003/2005	2007	2008		
	millions	billion $USD	$USD	%	billion $USD		top 20	top 100	top 500
USA	296.5	12,409.5	41,854	2.9	360	3837	17	54	159
Japan	128.0	3943.8	30,811	1.3	51	246	1	4	31
Korea	48.3	1056.1	21,868	2.6	27	3	0	0	8
Germany	82.5	2417.5	29,309	1.1	27	243	0	6	40
France	60.7	1829.6	30,120	1.4	26	157	0	3	23
Canada	32.3	1061.2	32,885	2.4	25	175	0	4	21
UK	60.2	1926.8	32,007	1.1	21	444	2	11	42
Italy	57.5	1667.8	29,019	0.9	15	75	0	0	22
Mexico	103.1	1052.4	10,209	1.3	14	14	0	0	1
Spain	43.4	1133.5	26,125	1.2	14	18	0	0	9
Australia	20.3	643.0	31,642	1.5	10	105	0	3	15
China *	1311.4	8787.2	6701	n.a.	n.a.	18	0	0	23
India **	1095.6	3815.6	3483	0.7	27	11	0	0	2
Brazil	186.4	1627.3	8730	0.8	13	4	0	0	6
Russia	143.2	1559.9	10,897	0.7	11	5	0	1	2
Indonesia **	221.6	847.4	3842	0.3	3	0	0	0	0

PPP = Purchasing Power Parity n.a. = data not available
* includes Hong Kong, excludes seven universities from Taiwan
** proportion of GDP spent on tertiary education is 2004 for India and Indonesia
Spending on tertiary education estimated using 2005 GDP data and 2003 proportion of GDP allocated to tertiary education
Sources: World Bank (2007), OECD (2006), Thomson-ISI (2007), SJTUIHE (2009)

The first global rankings of institutions, by the Shanghai Jiao Tong University in China (SJTIHE, 2009) in 2003 and the Times Higher Education Supplement in 2004, quickly secured a wide impact, except in the United States where the sector stayed with national rankings by the *US News and World Report*. Since then further rankings systems have appeared, mostly in relation to research performance. All of these developments have powerfully strengthened the potency of the global dimension to shape local higher education.

Rankings and league tables have quickly become a permanent part of the higher education landscape. They are the third inevitable feature of our world, after death and taxes. Rankings have limitations, and misuses as well as uses (for a valuable review see Salmi and Saroyan, 2007, pp. 31-68). Rankings have so far focused largely on research-heavy universities because research performance is more readily measured and ranked than other aspects; and research performance is rightly seen as highly strategic to national and institutional capacity and competitiveness. Thus most rankings devised so far are unimportant or irrelevant for the majority of institutions with lesser prestige or research capacity and a primarily local or national mission. The existing rankings also tend to disadvantage or eliminate from view specialist vocational institutions; large institutions with multiple social tasks that are disadvantaged by measures focused on average research outputs or student

selectivity; and non-English speaking institutions. These ranking systems militate against system diversity within national systems, and diversity on the global scale, while reinforcing the position of strong institutions and nations. They bifurcate higher education between those placed-based but globally engaged, and those who are merely place-bound (the same hierarchy is found in academic labour markets). One way out of rankings-created constraints on diversity is to establish classifications that enable separate rankings for different kinds of institution, like the Carnegie classification underpinning the *US News and World Report* ranking in the USA. A European typology of institutions is under development (Bartlese and van Vught, 2007; van Vught, 2009a). Nothing equivalent has emerged in Asia-Pacific. Nothing like a global classification system has yet emerged but the two principal research ranking systems, Jiao Tong and Taiwan, each extend to 500 and thereby constitute de facto classifications of the worldwide research university sector. The Leiden research rankings, probably the strongest data set, cover only the leading 250 universities. Rankings pose another danger for policy and strategy. They can lock institutional mind-sets into imitation of the leading institutions, so that institutional strategies eschew innovation and the institutions become inferior mimics of others.

It is just half a decade since the first release of the Shanghai Jiao Tong University research university rankings in 2003 (SJTUIHE, 2009). The *Times Higher* (2008) rankings are only four years old. The first comparative research ranking by the Higher Education Evaluation and Accreditation Council of Taiwan (HEEACT, 2009) was in 2007; the world level Leiden indicators first appeared in 2008. The two main systems for calculating publication and citation, Thomson-ISI and Elsevier-Scopus, are also very recent, especially the latter which commenced in 2007. Like national ranking by the *US News and World Report* (2007) the Carnegie classification of institutions in the United States has a longer history; but the classification of higher education in China is recent, and the European-wide system is still in preparation. The recency of these global k-economy systems underlines the extraordinary speed of their adoption and impact in policy and institutional behaviour.

> Governments and universities in Asia have taken university ranking exercises very seriously. Recent studies have repeatedly shown that universities in East Asia are increasingly under pressure to compete internationally and research has obviously become one of the major yardsticks in measuring university performance (Mok, 2009).

Hazelkorn (2008) for OECD demonstrates that the new body of comparative information, especially institutional rankings and research output metrics, has rapidly become installed in the perspectives, performance measurement systems and objectives of both national governments and higher education institutions; and is entering into the funding decisions of corporations, philanthropists and donors. Hazelkorn surveyed and interviewed institutional leaders in 41 countries on their response to university rankings and league tables. Almost universally, respondents testified that ‘rankings are a critical factor underpinning and informing institutional reputation’, affecting applications, especially from international students; university partnerships; government funding; and the employer valuation of graduates (Hazelkorn, 2008, pp. 197-198). Most university leaders had set in place strategies

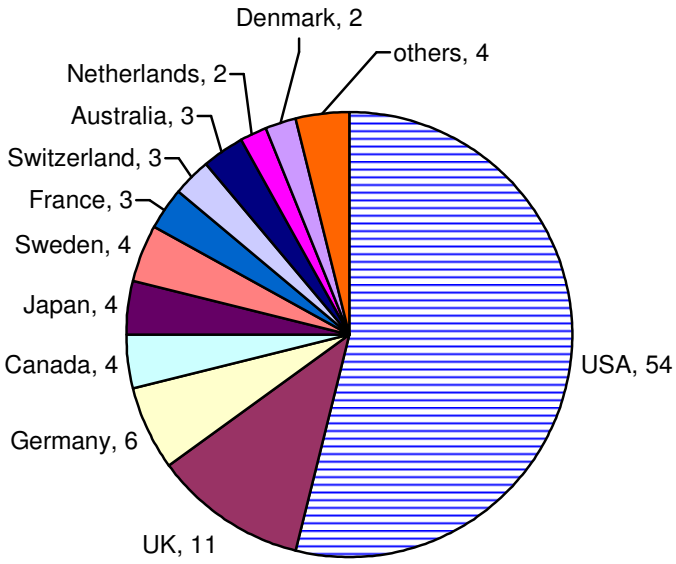
and systems to lift rankings, especially the Jiao Tong position. Only eight per cent of respondents stated they had taken no action in response to rankings (p. 199). Hazelkorn notes that many institutions had stepped up data collection on research and were monitoring the performance of comparator institutions also. Some universities had 'taken a more aggressive approach, using rankings as a tool to influence not just organizational change but influence institutional priorities' (pp. 199-201). Strategic attention has become focused on the constituent elements that constitute the Jiao Tong ranking, for example by recruiting Nobel Prize Winners and HiCi researchers, and awarding incentive funding for the publication of articles in the most prestigious journals. A May 2009 study by the US Institute for Higher Education Policy (IHEP, 2009) confirms the centrality of rankings in strategy making. IHEP also notes that in all four countries under study – Australia, Canada, Germany and Japan – rankings were seen as significant in their effects on the comparative attractiveness of the nation's educational institutions to international students (p. 28).

In their study of the effect of rankings in student application behaviour, Gunn and Hill find that in the early period after the introduction of league tables in the UK, 'the higher the league table position the faster the growth in [student] applications' (Gunn and Hill, 2008, p. 273), though the effect was mainly felt in newer and lesser status universities rather than the better known ones. The association subsequently weakened, but the lesser status institutions remained vulnerable to large swings in student applications. If rankings within a national system have a larger effect in less well known institutions, this draws attention to their potential in the global market for students where they are likely to be more important than in national markets due to heightened information asymmetries. Likewise, market research in Australia suggests that global rankings provide an important source of data for potential cross-border students, especially in relation to institutions and nations other than the US research sector and the leading British universities, which were known prior to global rankings.

In national policy, research rankings appear to generate tendencies to augment national investment in research (see section 1) and also to favour policies of concentration through selective research funding or institutional merger. In the first Jiao Tong ranking in 2003, the University of Manchester in the UK was placed at 89 and the University of Manchester institute of Science and Technology was at 201-250. Following a merger of the two institutions and their research, the University of Manchester climbed to position number 40 in the Jiao Tong table by 2008, which positions Manchester at the base level of the genuine world leaders. The lesson has not been lost on everyone else. Rankings may trigger an unfortunate tendency to size for its own sake even without the potential of scale economies – a potential which is often disappointed in mergers, as the 1987-1993 merger wave in Australia demonstrates. If so this foregrounds questions of institutional design. Unless systems of comparison develop that foster small specialist institutions (and it is hard to envisage such a development at this stage), the global setting will favour large loosely coupled institutions in which individual research units have considerable freedom to move while the institution qua institution supplies brand, organizational coherence and ranking cachet. Some leading US universities already fulfill this description.

The world according to the rankings: The Shanghai Jiao Tong university ranking has rightly gained primacy because of the rigour of its data collection process. All data sets are publicly transparent and not open to manipulation by individual countries and institutions. The ranking is confined to research, taking into account the distribution of leading scientists and English language publication and citation in the English language disciplinary literatures. There is a bias towards universities strong in the sciences because the humanities and non English language work are excluded. English-speaking nations constitute 72 per cent of the Shanghai Jiao Tong top 100 research universities. The United States is dominant in the English-speaking group, with 54 of the top 100 universities and 17 of the top 20. The UK has 11, Canada four and Australia three. In total 22 of the top 100 research universities are located in Western Europe aside from the UK, six in Japan, and one in each of Israel and Russia. The main Western European nations are Germany (six) Sweden (four), France and Switzerland (three) and Netherlands and Denmark (two each). The other four in the top 100 are Norway, Finland, Israel and Russia. None of the top 100 is in southern Europe or the Spanish-speaking countries, or China or India. Figure 2 is the breakdown of the top 100 research universities by nation.

Figure 2. **Distribution of world's top 100 research universities according to the Shanghai Jiao Tong ranking, 2008**

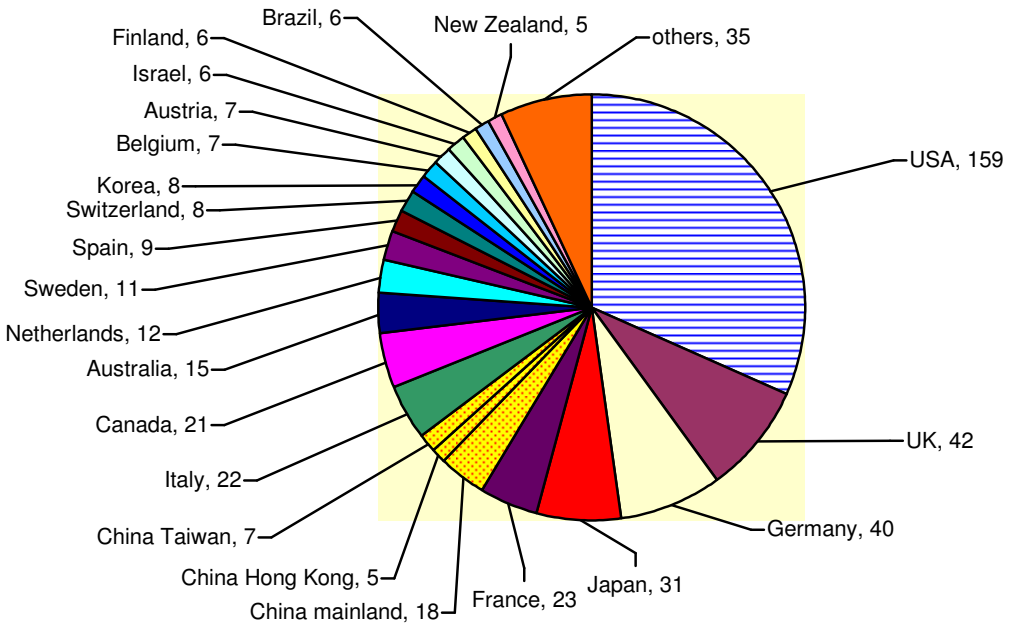


Others: Finland, Israel, Norway, Russia
Source: SJTUIHE, 2009

The USA has 159 of the top 100, followed by the UK with 42, Germany 40, Japan 31, all the Chinas together 30, France 23 and Canada 21. India has just three universities in the SJTUIHE top 500. Mainland China has 18 research universities in the top 500, Hong Kong China has 5 and Taiwan China has 7 (see Figure 3). The five Hong Kong

institutions in the world top 500 are the Chinese University of Hong Kong, Hong Kong University of Science and Technology and the University of Hong King, all between positions 201-302; and the city University of Hong Kong and Hong Kong Polytechnic University, both listed as between 303 and 401 in the world (SJTUIHE, 2009).

Figure 3. **Distribution of world's top 500 research universities according to the Shanghai Jiao Tong ranking, 2008**



others: Norway and Denmark 4; Ireland and South Africa 3; Russia, Singapore, Greece, Hungary, India, Poland, Chile and Portugal each 2; Argentina, Mexico, the Czech Republic, Slovenia and Turkey each 1.
Source: SJTUIHE, 2009

In the 2008 world research university ranking by the Higher Education Evaluation and Accreditation Council of Taiwan, the performance of the English speaking nations is again dominant, with 76 per cent: USA 60, UK 7, Canada 6, Australia 2 and the National University of Singapore which is at 86 in the world. Of the other nations Japan and the Netherlands each have 4 universities in the Taiwan top 100, Sweden has 3, Germany Switzerland and Italy each have 2; and the following nations have 1: Belgium, Brazil, Denmark, Finland, France, Korea and Spain. The USA has 163 universities in the Taiwan top 500, Germany 43, the UK 37 and Japan 34. There are 13 universities from Mainland China led by Tsinghua at 152 and Peking at 164, 5 from Hong Kong China and 5 from Taiwan China. The five from Hong Kong are as follows: University of Hong Kong 173, Chinese University of Hong Kong 275, Hong Kong University of Science and Technology 320, City University of Hong Kong 397 and Hong Kong Polytechnic University 455 (HEEACT, 2009).

As noted, the strongest research publication and citation indices so far are those developed at the Centre for Science and Technology Studies (CWTS) at Leiden

University in the Netherlands; though like all such metrics they tend to block recognition of innovations in field definition and new journals. Leiden manages its own bibliometric system and has devised four rankings of institutions: total numbers of scientific publications; citations per publication; publication volume modified by citations per publication and normalized by academic field, i.e. controlled for different rates of citation in disciplines, called the 'brute force' indicator because it rewards large institutions for their size; and citations per publication normalized by academic field. The Leiden group calls the last its 'crown' indicator (CWTS, 2009) because it provides the best measure of the quality of published work. The Leiden group published its first global ranking in 2008, incorporating publication and citation data for 2003-2007. The 'brute force' indicator measures quantity research power in science. The 'crown' indicator incorporates a larger element of quality, enabling boutique universities and consistency of quality to shine.

In the table for the 'brute force' indicator Harvard more than doubles the citation volume of the next university, the University of California at Los Angeles. US universities constitute 28 of the first 40. The UK, Canada and Switzerland perform well. In the Asia-Pacific Japan has eight of the top 250 universities including four of the first 50. Australia has seven, China including Hong Kong five, Korea three, Singapore two and China Taiwan one. Table 4 lists the Asia-Pacific universities. This table provides perhaps the best indicator we now have of the institutional weight of the universities concerned in the formal academic sector of the knowledge economy.

Ranking according to the Leiden 'crown' indicator, US universities hold the first 36 places. MIT, Princeton, University of California Berkeley and Stanford rank ahead of Harvard. Universities from Switzerland and the Netherlands emerge strongly, both nations doing better in this measure than others. Of the Asia-Pacific universities first is the University of Hong Kong at 117 followed by the Australian National University at 120, Melbourne at 154, Queensland at 159 and Tokyo at 160 (Table 5). Highest placed university on China's mainland is Peking at 228 but there are seven more institutions from China in places 234-249, and nine from Japan in places 202-238. The University of Hong Kong's high global placing on this indicator is very significant as an indicator of the quality of the basic research conducted in the institution.

Table 4. **Asia-Pacific universities in the Leiden ranking for 'brute force' in publication and citation (volume of publications modified by citation per publication and standardized for citation rates across the different field of study), world top 250, 2003-2007**

university	nation	position
U Tokyo	Japan	10
Kyoto U	Japan	27
Osaka U	Japan	36
Tohoku U	Japan	45
Seoul National U	Korea	57
National U of Singapore	Singapore	63
U Melbourne	Australia	70
U Sydney	Australia	72
U Queensland	Australia	88
Tel Aviv University	Israel	103
National Taiwan U	Taiwan China	110
U Hong Kong	Hong Kong China	114
Nagoya U	Japan	119
Kyushu U	Japan	120
U New South Wales	Australia	125
Hebrew University Jerusalem	Israel	127
Tokyo Institute of Technology	Japan	128
Tsinghua U	China	136
Australian National U	Australia	141
Peking U	China	145
Hokkaido U	Japan	146
Monash U	Australia	157
Yonsei U	Korea	159
Zheijang U	China	166
Technion Israel Institute of Technology	Israel	184
U Western Australia	Australia	193
Nanyang U Technology	Singapore	194
U Science and Technology China	China	195
Korean Advanced Institute of S&T	Korea	199
Shanghai Jiao Tong U	China	202
U Tsukuba	Japan	206
Korea U	Korea	216
National Chen Kung U	Taiwan China	226
Nanjing U	China	230
U Auckland	New Zealand	232
Hiroshima U	Japan	233
Fudan U	China	234
U Adelaide	Australia	236
Keio U	Japan	239
Chiba U	Japan	241
Okayama U	Japan	244
Hanyang U	Korea	245
Ben Gurion U Negev	Israel	246
Jilin U	China	248
Shandon U	China	250

Source: CWTS, 2009

Table 5. **Asia-Pacific universities in the Leiden ranking for citations per publication standardized for citation rates across different fields of stud), world top 250, 2003-2007**

university	nation	position
U Hong Kong	Hong Kong China	117
Australian National U	Australia	120
U Melbourne	Australia	154
U Queensland	Australia	159
U Tokyo	Japan	160
U New South Wales	Australia	163
National U of Singapore	Singapore	164
Osaka U	Japan	171
U Sydney	Australia	175
Kyoto U	Japan	180
U Auckland	New Zealand	185
U Western Australia	Australia	187
Korean Advanced Institute of S&T	Korea	190
Monash U	Australia	192
Hebrew University Jerusalem	Israel	193
Tokyo Institute of Technology	Japan	200
Yonsei U	Korea	201
Tohoku U	Japan	202
Seoul National U	Korea	203
Technion Israel Institute of Technology	Israel	206
Korea U	Korea	211
U Tsukuba	Japan	212
Tel Aviv University	Israel	213
U Adelaide	Australia	214
U Science and Technology China	China	215
Nagoya U	Japan	216
Nanyang U Technology	Singapore	217
Chiba U	Japan	223
Keio U	Japan	224
Kyushu U	Japan	225
National Taiwan U	Taiwan China	227
Peking U	China	228
National Chen Kung U	Taiwan China	229
Hanyang U	Korea	230
Hiroshima U	Japan	231
Hokkaido U	Japan	232
Shanghai Jiao Tong U	China	234
Ben Gurion U Negev	Israel	236
Fudan U	China	237
Okayama U	Japan	238
Tsinghua U	China	239
Nanjing U	China	240
Jilin U	China	242
Zheijang U	China	246
Shandon U	China	249

Source: CWTS, 2009

The other ranking which has gained significance is that of the *Times Higher Education Supplement* (THES, 2008). The *Times Higher* also has the apparent virtue of encompassing a broader set of indicators than just research. Hong Kong's institutions do much better in this ranking than any other. In 2008 the Times Higher placed the University of Hong Kong at 26 in the world (in 2007 it was higher at number 18), the Hong Kong University of Science and Technology at 39, the Chinese University of Hong Kong at 42, the city University of Hong Kong at 147. The countries with two universities in the Times Higher top 40 are the USA, UK, Australia, Japan, Canada, France and Hong Kong China. Australian universities are also rated much higher by the *Times* than any other ranking. But this is as they say 'fools gold'.

The data collected in the survey of university reputations, which comprises 40 per cent of the rankings position, are unsound because of the low response rate - 1 per cent in some years - and the fact that the pool of survey returns over-represents the former British Empire countries which do exceptionally well in the rankings. Data compilation and computation methods undergo annual changes which has contributed to the extreme volatility of rankings positions. For example over the five years of the survey Fudan University has been placed at 195 in 2004,then 72, equal 116, equal 85 and back down to 113 in 2008. Tsinghua has swung between 28 and 62; Osaka University between 44 and 105; Vanderbilt between 53 and 156; and RMIT University has endured successive placements of 55 in 2004, 82, 146 and equal 200 and then disappeared from the ranking altogether in 2008. Other problems with the *Times Higher* ranking are the use of a quantity indicator (student-staff ratios) as proxy for teaching quality, and the student internationalisation indicator which rewards student quantity not quality. The *Times Higher* often elevates leading national universities in individual countries above their level in other tables, augmenting its worldwide marketing. But a poor fit between university performance and dramatic annual changes in the ranking undermines the utility of the ranking for policy makers.

On 14 May 2009, QS Marketing which does the rankings for the *Times Higher*, released a new ranking of Asian universities. The University of Hong Kong was ranked first, the Chinese University of Hong Kong was second ahead of the University of Tokyo, and the Hong Kong University of Science and Technology was fourth. This is the only ranking in which institutions in Hong Kong eclipse Japan, and the only one in which the National University of Singapore, which was equal tenth, is ranked below the Chinese University of Hong Kong and the Hong Kong University of Science and Technology. The results seem scarcely credible. The methods of data collection and compilation are not fully transparent. It seems likely that the extraordinarily strong performance of the Hong Kong institutions is an artefact of defects in method, for example over-representation of Hong Kong respondents in the pool of survey returns.

The global position of the USA: In this period the global role of the United States is secured in part by its dominance in scientific research, knowledge in all fields, media and communications, and higher education itself. The first 36 universities in the Leiden crown indicator, the best indicator we have of the citation power of university scientific output, are all from the USA, an extraordinary level of global authority.

The USA has no explicit policy in relation to the global knowledge economy. The cross-border dealings of American institutions in education and research are conducted by the institutions themselves, albeit with official national endorsement and tacit support. Nevertheless, all agencies of education, research and government are conscious of the hegemonic position of the USA, especially in scientific research and doctoral education. The dominance of US institutions has been amassed over a long period and feeds into self-beliefs about intrinsic superiority and exceptional character. It is applied with coherence of purpose and supported by the USA's leading position in the military, political, economic, technological and cultural spheres. The conditions that underpin US dominance in the knowledge economy are scale, resources, the established concentrations of research capacity, the ability of US institutions to attract talent, a culture that values intellectual achievement and market creativity, and the advantages of an English language nation. The United States has the world's third largest population, much the largest GDP, and a GDP per head above $40,000. The next higher education nation in terms of investment, which is Japan (see Table 2), has less than half the population, one third the GDP and per capita income of just over $30,000. The USA also spends a higher proportion of GDP on tertiary education than any other nation, 2.9 per cent in 2003. As noted this amounted to about USD $360 billion in 2005 in Purchasing Power Parity (PPP) terms: US investment in higher education was *seven times* that of Japan and 17 times that of the UK.

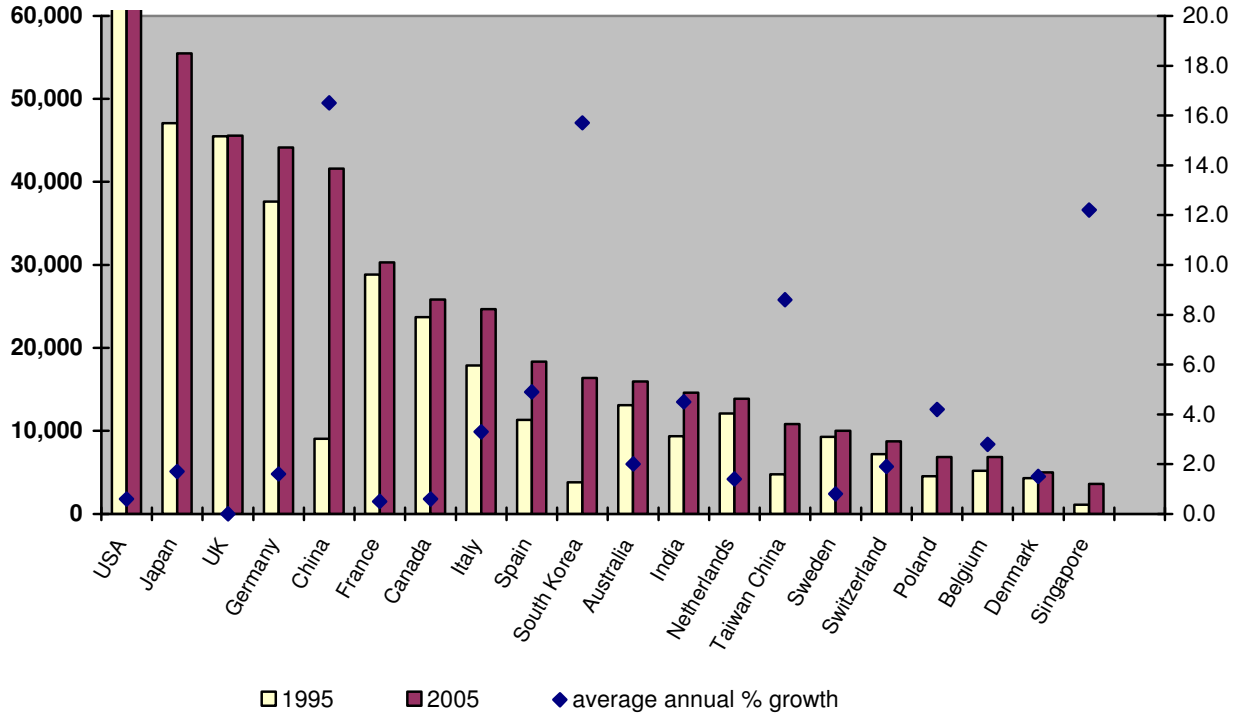
The USA is also relatively open to foreign academic talent and has the will and means to attract that talent. The foreign doctoral enrolment was 102,084 in 2004-2005 (IIE, 2007). Foreign-originated personnel have become essential to university and industry research in many fields. Almost two thirds of all foreign doctoral students in the USA receive subsidies from their host university; American salaries are attractive; and compared to most national labour markets the American academic labour market is flexible. The norming of part-time and non-tenure track labour, the weak nexus between remuneration and calendar and major variations in levels of pay and allowances, coupled with the size and differentiation of higher education, ensures a multiple and varied opportunity structure, highly accessible to foreigners. There are signs that the talent flow into the USA is increasing, for example the rising proportion of foreign students within the total doctoral cohort and the growing stay rates of foreign doctoral graduates, though the upward trends wobbled in the wake of the American reaction to the 11 September 2001 attacks. Stay rates vary by field of study and nation. Potential migration is especially high for students from China, Israel, Argentina, Peru, Eastern Europe and Iran; and some wealthy countries including the UK, Canada, New Zealand and Germany. Between 1992 and 2001 the stay rate for Chinese graduates in science and engineering jumped from 65 to 96 per cent, and for India from 72 to 86 per cent (Vincent-Lancrin, 2004, p. 32), though stay rates are lower for Korea, Japan, Indonesia and Mexico (Guellec and Cervantes, 2002, p. 92). One outcome is that net brain drain is a potential problem for all nations other than the USA. In 2003 three quarters of EU citizens who obtained a US doctorate said they had no plans to return to Europe (Tremblay, 2005, p. 208).

Not only does the US function as the global graduate school and the primary employer of post-doctoral researchers, these roles are instrumental to its leadership of the global knowledge economy and underpin not only a high level of American

investment in talent but subtract from the pool of talent in other nations. In many respects k-economy competition is competition for talent. It is competition not just for the best ideas today but for the means of creating the best ideas tomorrow. There is no sign that American knowledge economy leadership is about to diminish. The United States will almost certainly respond in 'Sputnik' fashion to the pattern of increased investment in knowledge, including research universities, in China and Europe, in order to maintain its global advantage.

The rise of Asian science: Nevertheless, a notable development of the last decade has been the beginnings of a process of global pluralisation of research capacity in the sciences, especially but not only in China. Between 1995 and 2005 the annual number of scientific papers produced in China (including Hong Kong) rose from 9061 to 41,596. China was poised to overtake UK and Germany, though its output was less than one fifth that of the EU as a whole. Between 1995 and 2005 China's annual output of papers rose by 16.5 per cent per annum. The annual rate of growth in South Korea was 15.7 per cent, Singapore 12.2 per cent and Taiwan China 8.6 per cent (NSB, 2009). In 2003 Singapore invested 2.24 per cent of GDP on R&D, a higher figure than Canada (World Bank, 2007). In contrast, between 1995 and 2005 the number of papers produced by EU nations rose by 1.8 per cent per annum, with rapid growth only in outliers such as Portugal and Turkey. Papers produced in the USA increased by 0.6 per cent per annum; in the UK the number did not rise (Figure 4).

Figure 4. **Growth in annual number of scientific papers, selected nations, 1995-2005**



Note: USA total papers 193,337 in 1995 and 205,320 in 2005.
Source: NSB, 2009

Maddison (2007) has prepared a long run study of the share of world GDP by region, for OECD. In 1700 China and India produced 46.7 per cent of world product, reflecting their rural demography, with 21.9 per cent in Western Europe including the UK and 0.1 per cent in the USA. By 1978 at the start of the 'Four Modernisations', China's share had fallen to just 4.9 per cent and India was at 3.3 per cent. By 2003 the USA was on top with 20.6 per cent of world GDP, ahead of Western Europe at 19.2 per cent, but China had reached 15.1 per cent again and India had begun to climb. By 2030 China is expected to return to its historic position with 23.4 per cent (Table 6) (Maddison, 2007, p. 103). This does not inevitably translate into global leadership in scientific research. But China seems determined to achieve that goal.

Table 6. **World GDP shares by region, 1700-2030**

	1700	1820	1952	1978	2003	2030*
China	22.3	32.9	5.2	4.9	15.1	23.1
India	24.4	16.0	4.0	3.3	5.5	10.4
Japan	4.1	3.0	3.4	7.6	6.6	3.6
Russia/USSR	4.4	5.4	9.2	9.0	3.8	3.4
Western Europe	21.9	23.0	25.9	24.2	19.2	13.0
United States	0.1	1.8	27.5	21.6	20.6	17.3

* Predicted.
Source: Maddison, 2007, p. 103.

Though China's researchers are unable to conduct global research conversations in the national language and China's transformation in education and research 'may still be only in its relatively early stages' (Li et al., 2008, p. 45), the nation's extraordinary trajectory is remaking the knowledge economy landscape. For example, between 2000-2005 R&D investment in China rose by 18.5 per cent per year. In comparison, between 1995 and 2005 Finland led R&D investment in the European Union with an increase of 7.8 per cent per year. Investment in Germany rose by 2.5 per cent and France 1.3 per cent per year (OECD, 2007b). Between 1996 and 2005 China's investment in R&D as a proportion of GDP rose from 0.57 to 1.35 per cent (World Bank, 2007). In 2006 China became the world's number two R&D spender. Between 2004 and 2005 international patents filed in China grew by 47 per cent (Li, et al., 2008, p. 43). Less than one quarter of basic research in China takes place in universities, compared to over half in many OECD nations and over 70 per cent in the USA (OECD, 2008c, p. 80). The state enterprises receive more R&D investment than the universities. Nevertheless China is the third largest investor on R&D in higher education, after the USA and Japan, at over $10 billion in 2005 (OECD, 2007b). China's demography suggests vast long-term research potential. It is expected that by 2050, 90 per cent of all PhDs in the physical sciences and engineering will be held by Asians living in Asia, most of them produced by China (Li, et al., 2008, p. 6). As will be discussed in section 6 the number of tertiary students in China has grown as rapidly as China's research output, by four times in a decade. China has also lifted the quality of its tertiary institutions at the same time as they have grown rapidly.

In 2005 China's investment in R&D in higher education was still only one quarter of the level in the United States but if present rates of growth continue, inside a generation China will exceed the investment in each of US and European higher education. However it will take longer to cement a leading position in terms of recognized quality and leadership in research. There are lags between the time of investment in research and the production of stellar science at scale; and further lags between output and publication, publication and citation, and citation and the aggregation of those citations for ranking purpose – perhaps 20-25 years all told. In 2008 European nations aside from the UK housed 88 of the top Jiao Tong discipline groups. The UK had 50, the USA had 308. There were ten in China. Of China's 10 top 100 fields, nine were in the field of engineering, Two are in the leading 50 in the world Hong Kong University of Science and Technology (40 in the world) and Tsinghua (50). The City University of Hong Kong, and the University of Science and Technology on the mainland, are ranked in the 51-75 bracket for engineering. The Chinese University of Hong Kong, Shanghai Jiao Tong University and Zhejiang University are ranked in the 76-107 bracket. In addition the Hong Kong University of Science and Technology was ranked in the 51-76 bracket for social sciences. National Taiwan University and are both ranked in the 51-75 group for engineering. Table 7 summarizes these data on the basis of national systems:

Table 7. **University discipline groups in the world top 100, by nation, Shanghai Jiao Tong rankings, 2008**

	PHYSICAL SCIENCES	ENGINEERING	LIFE SCIENCES	MEDICINE	SOCIAL SCIENCES	TOTAL
USA	59	49	62	61	77	308
UK	9	7	11	12	11	50
Canada	2	6	5	6	7	26
Germany	7	1	6	6	0	20
Japan	7	7	3	2	0	19
Netherlands	1	3	2	5	4	15
Switzerland	3	2	4	2	0	11
Australia	1	3	4	3	1	10
Israel	4	2	2	2	0	10
China	0	9	0	0	1	10
Sweden	2	3	2	2	0	9
France	5	2	1	1	0	9
Belgium	0	2	3	2	1	8
Italy	2	3	0	1	0	6
Denmark	2	1	1	1	1	6
South Korea	1	3	0	0	0	4
Singapore	1	2	0	0	1	4
others	1	2	1	3	1	8

Source: SJTUIHE, 2009

The future of Chinese knowledge power is not simply a function of GDP shares and investment. It is also tied to the evolving role of China in culture and language and the degree to which world science feels it must come to China (as well as vice versa).

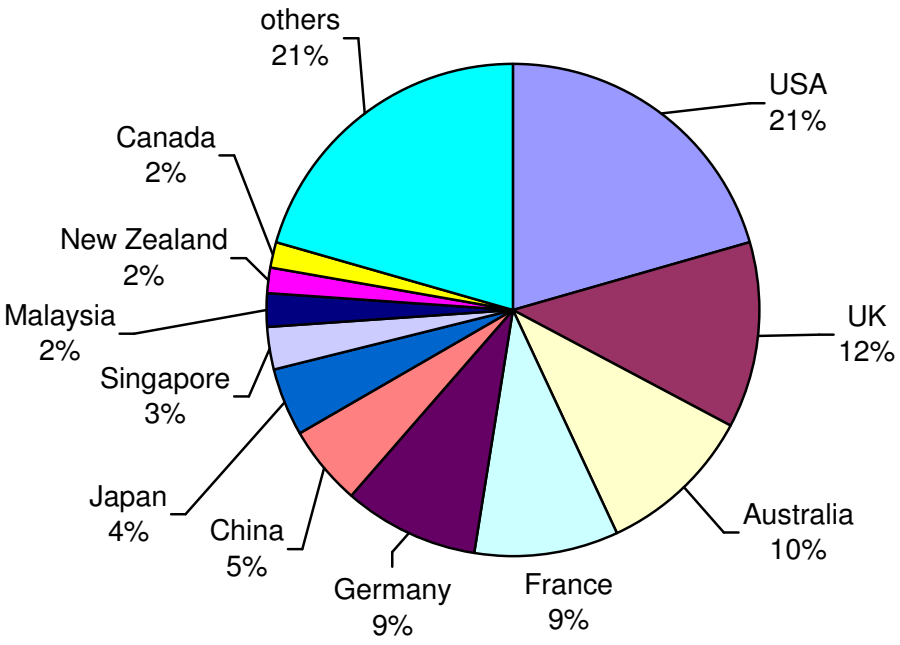
> The ritualistic assertion that English is the language of global communication and scientific research belies Mandarin's rising status. Within the Asia-Pacific region, the number of Chinese-speakers and English-speakers is almost identical, in both cases around 1 billion. China's rising strategic, economic and cultural significance, and its worldwide diaspora of 35 million, is boosting demand for educational services in Mandarin, as evident in the rising number of overseas students at its universities (now over 100,000), the explosion of Chinese material on the web, and the proliferation of Confucius Institutes (devoted to the study of Chinese language and culture) worldwide… (Welch and Zhen, 2007, p. 6).

Regardless, recent and current investments in R&D will bear fruit in the emergence of world leading universities in China and Singapore and possibly also Korea and Taiwan China. China's universities will push up the global rankings. A key element of global competition will be competition for Chinese doctoral and post-doctoral personnel, who have an essential role in the US research system and are central to China's emergence as an R&D giant. It is likely there will be increased two-way diasporic movement between China and USA. The global pluralisation of research capacity is a very significant development, though the full effects in the economic, cultural and political spheres will take a generation or more to show.

At this stage India is not in the same category as China as an emerging knowledge economy, despite its impressive rate of growth in the number of graduate engineers and technicians. For example between 1995 and 2005 India's rate of growth of scientific papers was just 4.5 per cent per annum from a low base, and total scientific papers at 14,608 in 2005 was one third the number produced in China despite the widespread use of English in India which confers an advantage in the k-economy (NSB, 2009). India has yet to indicate a coherent national policy that would lift participation and research at scale. The principal policy story of the last decade in education and research is not 'the rise of China and India' or 'the rise of Asia'. It is primarily the rise of China; and also the rise of Taiwan China, Singapore and Korea.

Competition for exports: The map of education exports (Figure 5); the leading nations in the cross-border degree market in quantity terms, as measured by share of the global market; has some resemblances to the map of research power (Figure 2) – for example the English speaking nations lead both - but is by no means identical.

Figure 5. **Shares of cross-border students, by export nation**



Source: Verbik & Lasanowski, 2007

Figure 5 shows the distribution of international students by major exporting nation. These data are supplied by the Observatory on Borderless Higher Education (OBHE), and are based on the UNESCO collection. They include all tertiary international students enrolled in the provider nation, i.e. those students that have crossed borders. They exclude offshore transnational enrolments, but include the English language colleges that are excluded from the OECD (2008c) student data. Of the international students in the OBHE/UNESCO collection, 50 per cent were in English-speaking nations: the USA (21 per cent), UK (12 per cent), Australia (10 per cent), Singapore (3 per cent) and New Zealand and Canada (each 2 per cent). The English speaking countries have varied global roles. Whereas the UK enjoys a similar market share of both the world's top 100 research universities and the cross-border student population, the USA and Canada are more prominent in research capacity than the student market, while Australia is more prominent in the student market than research capacity. New Zealand follows the Australian pattern but on a smaller scale.

What the aggregate data do not show is variation in the academic quality of international students entering each national system. Though the USA is the largest single destination for international students because of its size and power of attraction, international education actually plays a relatively marginal role in the American domestic system, constituting less than 4 per cent of enrolments in higher education.

The doctoral research universities focus more on quality of students than on quantity; and almost two thirds of all their international students are supported by scholarships, nearly all provided by the universities (IIE, 2007). The US proportion of global exports (21 per cent) is less than half of its proportion of the top 100 research universities (54 per cent). Evidence from practice and the literature confirm that the USA's global orientation is fulfilled as intended. It attracts more than its share of the academically strongest cross-border students, as do the peak UK universities. More than one third of all doctoral graduates from US universities are international students. In the UK, which sustains both a commercial international education sector and the large scale recruitment of international doctoral students, 50 per cent of all PhD graduates are international. In comparison doctoral education plays a lesser role in cross-border education in Australia and New Zealand, which provide few scholarships that cover both tuition and living costs in the manner of US universities.

Although the US doctoral universities do not set out to maximize revenues from foreign students, the US is nevertheless the largest single export earner from cross-border international education. In 2005 US exports earned $14.1 billion compared to $6.1 billion in the UK and $5.6 billion in Australia. Table 8 summarizes the details.

Table 8. **Exports of education services, English-speaking nations excluding Singapore, 2000-2005 (US dollars)**

	2000	2001	2002	2003	2004	2005	growth 2000-05
	$s million	$s million	$s million	$s million	$s million	$s million	%
USA	10,350	11,480	12,630	13,310	13,640	14,120	36.4
UK	3766	3921	3891	4709	5627	6064	61.0
Australia	2259	2528	2897	3925	4872	5563	146.3
Canada	615	699	784	1014	1268	1573	155.8
New Zealand	257	343	632	925	998	1000	289.1
total of above countries	*17,247*	*18,971*	*20,834*	*23,883*	*26,405*	*28,320*	*64.2*

Source: Bashir, 2007, p. 19

Bashir notes that the global trade in education services constitutes approximately 3 per cent of world trade in services at the end of the 1990s, and in 2000 the global value of exports of education services was $17.2 billion US compared to $6.5 billion for health services. In 2004 China spent $5.1 billion on importing education – with an additional $0.8 billion allocated by Hong Kong - while India spent $3.1 billion, Malaysia $0.9 billion, and Indonesia and Singapore both spent about $0.5 billion. 'China's imports represented about 60 per cent, and India's about 80 per cent, of domestic public spending on higher education. The value of Indonesia's imports of higher education exceeded domestic public spending' (Bashir, 2007, pp. 19-20). These nations thus have a clear motivation for expanding local tertiary provision to enable some import replacement, though this involves a partial shift from private financing to taxpayer financing, and is unlikely to diminish the desire of some families to access foreign education as a means of national and global social mobility.

The cross-border market in students is diversified between high prestige research universities; medium prestige research institutions such as many of those in the UK, Australia and New Zealand; and vocational training institutions such as the University of Phoenix, franchised UK universities and the Malaysian colleges (Bashir, 2007). Together with the growth of Asian economies and the expansion and modernization of their education systems, the more diversified market increases the potentials for emerging exporters. The education export is also pluralising by nation and at a more rapid rate than is research capacity and performance. Figure 6 shows that China, Malaysia and Singapore command 10 per cent of the global market between them. The market share of all three nations has grown rapidly. In China and Singapore rapid economic growth has made the nation a more attractive destination for foreign students. In Malaysia tuition prices are lower than in the English language countries. Singapore has systematically built a role for itself in education export and its market share is now higher than New Zealand. Verbik and Lasanowski comment that:

> It is Singapore's demography, however, which makes it an especially attractive destination for international students, especially those coming from Asia and the South Pacific. With a population consisting of ethnic Indians, Malays and Chinese, Singapore has the capacity to provide regional students with a 'Western' education in a familiar socio-cultural environment. Given that Singapore offers bilingual provision for many of its programs, it may become even more popular among Chinese students in particular because of the opportunity to pursue overseas studies in mandarin, in addition to English. For this reason, while it may seem an ambitious target, the country's ministry of Foreign Affairs believes that by purposefully marketing Singapore as a regional 'centre of excellence' offering the best of 'East' and 'West', it can successfully attract an additional 150,000 foreign students to the country by 2015 (Verbik and Lasanowski, 2007, pp. 21-22).

The majority of China's international students come from Asia, especially Korea. At the same time, China is by far the largest supplier of students to Japan, which receives about the same number of Chinese students as enter each of the USA and Australia each year. China is now both the world's largest importer of education, and the sixth largest exporter. Its number of foreign students increased from 52,150 in 2000 to 162,695 in 2006, 212.0 per cent, while numbers in Australia grew by 103.5 per cent and in the UK by 46.9 per cent (Verbik and Lasanowski, 2007, p. 37). France, Germany and Japan take a non-commercial approach to student mobility and emphasize aid, between them contributing almost 80 per cent of all aid for post-secondary education in 2004. Much of the aid is use to pay for scholarships for students from developing nations. These scholarships cover living costs, as little or no tuition fees are charged. Japan plays a particularly significant aid-based role in Asia, nearly all on a bilateral basis. A total of 89.9 per cent of Japan's aid is to Asian nations with 65.0 per cent going to China (Bashir, 2007, pp. 21-25).

Though all prediction is fraught because of the global recession it appears likely that the rate of growth of cross-border international education will continue to exceed the rate of growth of domestic education. This is largely due to global economic and cultural convergence, and the expansion of the role of globally mobile labour, plus the

continuing growth of the middle classes in China, India and Korea. The expansion and improvement of domestic systems will modify but not replace demand for offshore education in China and India, as has been the case of Korea and Japan, where offshore education continues regardless of the relatively advanced development of domestic participation and research quality. There will always be some students who seek to secure career or migration advantages by crossing borders for their education. However as China's domestic tertiary education system expands and improves it can be expected that part of the cross-border student demand will shift to the postgraduate stage. India's fertility rate ensures that in the longer term it not China will become the largest single global contributor to the school leaver age group; and India has been slower than China to grow and improve domestic education, suggesting that the drivers of offshore education will be stronger in India. In Thailand and Indonesia, which together have the same population as the USA, it is likely that in 2010-2020 significant unmet demand for research university places will drive offshore enrolment. The latter is substantially under-provided with tertiary education which is under-funded even relative to the low GDP per head. It is more difficult to anticipate future national shares of global exports. Exports from Asia are growing (Verbik and Lasanowski, 2007) and this will continue to 2020. In other words, student flows out of Asia will become more evenly balanced by flows into Asia; and the dominant export role of the English-speaking nations will be modified.

4.2 Australia

Comparative investment in tertiary education: Australia is a higher than average spender on tertiary education that is atypical of the OECD group in certain respects. Its public source investment is below the norm; its private source investment is unusually high after having grown very rapidly since the mid 1990s. Since the mid 1990s most OECD countries have increased private spending both on education as a whole and on tertiary education, and the private share of spending has risen.

> It is notable that decreases in the share of public expenditure in regard to total expenditure on educational institutions and, consequently increases in the share of private expenditure, have not generally gone hand in hand with cuts (in real terms) in public expenditure on education. In fact, many OECD countries with the highest growth in private spending have also shown the highest increase in public funding of education. This indicates that an increase in private spending tends not to replace public investment but to complement it (OECD, 2007c, p. 213).

However this is not the case in tertiary education in Australia. In 2005 the average OECD country allocated 1.5 per cent of GDP to tertiary education from public and private sources. Australia allocated 1.6 per cent and was equal sixth investor in tertiary education of the 29 OECD countries that provided data, after the USA (2.9 per cent), Canada (2.6 per cent), Korea (2.4 per cent) and Denmark and Finland (1.7 per cent). Poland and Sweden were level with Australia on 1.6 per cent. Switzerland probably spent more than Australia as it invested 1.4 per cent of GDP in public source funding of tertiary education alone, but data for Swiss private investment are not

available. The OECD's partner countries Chile (1.8 per cent) and Israel (1.9 per cent) are also relatively high investors (OECD, 2008c, p. 240).

The public/private split of tertiary funding varies markedly across the OECD group of nations. The OECD average for private source spending is 0.4 per cent of GDP. The role of private funding peaks in the USA (1.9 per cent of GDP) and Korea (1.8 per cent), Japan (0.9 per cent) and Australia which allocates 0.8 per cent of GDP in the form of private investment in tertiary education, double the OECD average (OECD, 2008c, p. 240). In Australia 52.2 per cent per cent of tertiary funding was from private sources in 2005, compared to the OECD average of 26.9 per cent. This was the fourth highest level in the OECD after Korea (75.7 per cent), Japan (66.3 per cent) and the USA (65.3 per cent). In Canada the private share of funding was 44.9 per cent, New Zealand 40.3 per cent and in the UK 33.1 per cent; indicating that higher than average private funding is a feature of two groups of nations in the OECD: the Anglo-American and the East Asian. In Europe the role of private funding is generally modest though Italy and Portugal are above 30 per cent (OECD, 2008c, p. 253). Between 2000 and 2005 total private source funding increased in every OECD nation except Ireland and Spain. There was also a marked shift from public source funding to private source funding at tertiary level in many OECD countries. The OECD notes:

> In more than one-half of the OECD countries and partner economies with comparable data in 1995 and 2004, the private share increased by 3 percentage points or more. This increase exceeds 9 percentage points in Australia, Italy, Portugal, the Slovak Republic and the United Kingdom, as well as the partner economies Chile and Israel… only the Czech Republic and Ireland – and to a lesser extent Spain – show a significant decrease in the private share allocated to tertiary educational institutions... The amounts paid by students and their families to cover tuition fees and other education-related expenditures differ among OECD countries according to taxation and spending policies, and the willingness of governments to support students. This willingness is influenced by students' enrolment status (full-time or part-time), age and residency (whether they are living at home). To some extent, however, the guidelines used in establishing eligibility for these subsidies are breaking down. Mature students, whose numbers are increasing, are more likely to have established their own households and to prefer part-time or distance learning to full-time, on-campus study. Rises in private educational expenditure have generally gone hand in hand with rises (in real terms) in public expenditure on education at the tertiary level, as for educational expenditure when all levels of education are combined. Public investment in tertiary education has increased in all OECD countries and partner economies (except Australia) for which 1995 to 2004 data are available, regardless of changes in private spending. The only exception to this is Australia (see explanation on HECS above), where the shift towards private expenditure at tertiary level has been accompanied both by a small fall in the level of public expenditure in real terms and also by a significant increase of public subsidies provided to tertiary students (OECD, 2007c, p. 217).

In Australia the private source share of tertiary education funding rose from 35.2 per cent in 1995 (OECD, 2007c, p. 221) to 52.2 per cent in 2005. This is a major change

in only a decade, signifying a large scale transfer of the cost of investment in tertiary education from government to students, families and other private sources; the largest such change in any nation in the OECD. In public funding of tertiary education, Australia is a relatively low investor at 0.8 per cent of GDP in 2005 compared to the OECD average of 1.1 per cent. Australia is 24th of the 28 OECD countries for which data are available (OECD, 2008c, p. 240). Public funding of tertiary education rose by 15 per cent between 2000 and 2005 but this followed a sharp decline in total public funding and more sharply, funding per student, in the 1995-2000 period. The depressed level of public funding places considerable strain on the capacity to support basic research. Augmented private source incomes do not necessarily substitute for reduced public incomes. This is because public and private funding are associated with different patterns of expenditure. A large proportion of international student fees must be ploughed back into the costs of the business; the marketing, recruitment, services and other provision needed to keep the money coming in.

Comparative research performance: The distribution of the world's top 100 and 500 research universities in the Shanghai Jiao Tong University rankings was reviewed above (Figures 3 and 4). Australia has 15 of the Shanghai Jiao Tong top 500 research universities. It also has 11 of the Taiwan Higher Education Evaluation and Accreditation Board top 500, which like the Jiao Tong is exclusively based on research. Two Australian universities, Tasmania and La Trobe, were in the Taiwan top 500 in 2007 but not in 2008. The Jiao Tong outcome is a good result for a nation of Australia's size, on par relative to size with Canada and Germany, nations that like Australia that also sustain a broad spread of capacity. However, Australia is weaker at the top level of research performance. It has three universities in the top 100 in the Shanghai Jiao Tong ranking, but all are in the second fifty: ANU 59, Melbourne 73 and Sydney 97. In the Taiwan table Australia has two universities in the top 100: Melbourne 58 and Sydney 83. Table summarizes the two ranking outcomes.

Table 9. **Australian universities in the Shanghai Jiao Tong top 500, 2008, and the Higher Education Evaluation and Accreditation Board of Taiwan top 500, 2008**

	Shanghai Jiao Tong 2008	**Taiwan HEEAB 2008**
top 50	nil	nil
51-100	ANU (59), Melbourne (73), Sydney (97)	Melbourne (58), Sydney (83)
101-150	Queensland, WA	Queensland (101), ANU (146), NSW (148)
151-200	NSW	Monash (176)
201-300	Adelaide, Macquarie, Monash	WA (238), Adelaide (299)
301-400	Flinders, James Cook, Newcastle, Tasmania, Wollongong	nil
401-500	La Trobe	Newcastle (449), Macquarie (454), James Cook (497)

Source: SJTUIHE, 2009; Taiwan HEEAB, 2007.

Australia's performance compares unfavourably with the UK, with the same GDP per head as Australia and just three times the GDP size but 11 of the Jiao Tong top 100, and Canada, which has four universities in the top 100 led by Toronto at equal 24 and the University of British Columbia at 35 (SJTUIHE, 2009); and a massive six in the Taiwan top 100 including Toronto at 14, British Columbia at 33 and McGill at 34 (HEEACT, 2009). Toronto has the third highest volume of academic publications in the world after Harvard and the University of Tokyo. On this measure the highest placed Australian university, Sydney, is in 52nd spot (CWTS, 2009). The leading Australian universities are also placed below those of Switzerland, Sweden and the Netherlands, all smaller nations that are additionally handicapped in global research competition in that English is not the national language. It is apparent that Australia lacks truly stellar research universities, which in the age of the global knowledge economy have become qualitatively more important to nations than before.

Marginson and van der Wende (2007) compare each nation's number of universities in the Shanghai Jiao Tong ranking, with national economic size and wealth as measured by a compound of aggregate GDP and GDP per head. Using this measure, nations with university systems that are stand-out performers in research, relative to economic capacity, in order are Israel, Sweden, Switzerland, the UK (these first four are notably superior to all the others), the Netherlands, Canada, Finland, Denmark, Australia and the United States. In all of these cases except the UK, Australia and the USA, superior national performance relative to economic capacity is correlated to a level of public investment in research in higher education that is equally superior in comparative terms. Further, except in the case of the United States, the private sector plays a relatively minor role in the nations in the high performance group. In contrast, several of the nations that under-perform relative to economic capacity have large private sectors and a highly stratified research effort, including Japan, Korea, Poland, Brazil and Mexico. This underlines the dependence of research capacity on public investment, given the public good character of research (Stiglitz, 1999).

Because in Australia funded research grants do not cover all project costs, some research costs are supported by foreign student fees. These fees also fund some capacity building in research (Marginson and Eijkman, 2007). Only a small part of total research costs are supported this way, but it is strategically significant because it is discretionary, i.e. it can be increased by the institution's own efforts or policies, without policy decision or competitive process. This reinforces Australian higher education's dependence on successful performance in *both* research competition and the high volume segment degree market – something it shares only with the UK and New Zealand - and enhances the dependence of Australian institutions to high volume cross-border enrolment (see sections 6 and 9). The nation was the nearest policy similarities to Australia, the UK, do not share the same level of dependence on international students for research support. In the UK publicly funded research is fully funded, and there have been much larger performance-based allocations to research via the RAE (see section 2). As noted in section 1 the Australian government has now moved to introduce full cost research funding but this will be phased in over six years.

As noted, the Shanghai Jiao Tong Institute of higher education also provides rankings of the top 100 universities in each of five broad discipline areas: physical sciences, engineering, life sciences, medicine and the social sciences. What immediately stands out is that the United States has 308 of these top 500 centres of disciplinary excellence, including a massive 77 per cent in the social sciences (Table 7 above). Australia has ten of these top 100 discipline groupings in its universities, of which there are three each at each of ANU and Melbourne. ANU in Physical Sciences (38) and Life Sciences (40), and Western Australia in Life Sciences (47), have discipline groups in the world's top 50 (Table 10). However on this measure of disciplines in the top 100 Australia is well behind its closest comparator Canada, which has 26 such discipline groups, the Netherlands (15) and Sweden (11). Canada is just 40 per cent bigger than Australia in population and GDP level, but 160 per cent stronger in the number of centres of disciplinary excellence. Netherlands is similar in GDP per head to Australia and has a population one quarter smaller; yet it has 50 per cent more top discipline groups. Israel has the same number of top 100 discipline groups as Australia though like Sweden it is a much smaller nation and university system.

Table 10. **Australian universities with discipline groups in the Jiao Tong top 100, 2008**

university	discipline groups
ANU	Physical Science (38), Life Science (40), Social Science (51-76)
U Melbourne	Engineering (51-75), Life Science (76-107), Medicine (52-75)
U Queensland	Life Science (76-107), Medicine (52-75)
U Western Australia	Life Science (47), Medicine (76-107)
U Sydney	Engineering (51-75)
U New South Wales	Engineering (76-107)

Source: SJTUIHE, 2009

In terms of the volume of scientific output, the US National Science Board (NSB) data show that Australia produced 15,957 papers in science, technology and social sciences in 2005, 2.2 per cent of world output, compared to 6.4 per cent in the UK, 3.6 per cent in Canada and 2.0 per cent in the Netherlands. Australia was the 11th largest science producer in volume terms. In the last decade total production of scientific papers in both China and Korea moved past Australia. However the Australian share held its own compared to North America and Europe volume shares, which declined overall in the wake of the rising Asian science powers (NSB, 2008). In the Leiden rankings for publication and citations, Australian universities perform best on those measures based on total publication volume in which size constitute an advantage. In columns 2 and 3 of Table 11, Melbourne, Sydney and ANU all figure in the second 50. Australia is weaker in terms of citations per publication, however.

Table 11. **Australian universities in the Leiden University top 250 world research rankings, 2008**

university	total publications	total publications in terms of citations per publication normalized for field	citations per publication normalized for field
ANU	151	141	120
U Melbourne	58	70	154
U Queensland	73	88	159
U New South Wales	107	125	163
U Sydney	52	72	175
U Western Australia	180	193	187
Monash U	138	157	192
U Adelaide	230	236	214

Source: CWTS, 2009

The comparative citation impact of Australian research has been subject to different measures with varying results. In the wake of the Dawkins reforms, which installed research performance measures that rewarded volume, the comparative volume of research papers improved but comparative impact deteriorated. Butler (2003) attributes this conjunction to the quantity incentive. A study by Thomson-ISI, based on that publishing companies' data base and released in 2004, found that Australian researchers exceeded average world impact levels in 12 of 20 broad fields of research, and Australian citation impact was overall about at world average level. In comparative citation impact Australia falls behind Canada and European comparators such as the Netherlands, Sweden, Switzerland and Finland. As with the Jiao Tong research rankings, the overall position suggests good rather than stellar science, with significant variations by field of research and pockets of outstanding work.

The National Science Board (2009) also provides comparative data on international collaborations in science. In 2005, 56.6 per cent of all science papers published by Australians were co-authored with international collaborators, a rate of international collaboration above the international average and one that compares favourably with China (29.9 per cent), the USA (32.2 per cent) and Singapore (53.8 per cent); but below Sweden (75.2 per cent), the Netherlands (71.5 per cent); and a little below the UK (61.9 per cent), Israel (61.0 per cent) and Canada (58.7 per cent). These data indicate that Australia could lift the extent of collaboration but is in the normal zone. For Australian the emergence of East and Southeast Asia as an additional science 'hotspot' has major implications, because of the permanent importance of these nations to Australia for geographical, demographic and economic reasons. The rise of Asian science underlines the need for Australia to focus on enhancing not just the recruitment of full fee paying students from Asian nations, but research collaboration in Asia, especially in China, and to significantly expand the inflow of high quality Asia-Pacific doctoral students and post-doctoral scholars into Australia.

4.3 Personal note

In Australian policy circles, and public debate, there is relatively little discussion of Australia's comparative position in relation to research and particularly the performance of its leading research universities in ranking and citation relative to international comparators. Some public discussion has been instigated by the author, the Group of Eight (the eight leading research universities) and *The Australian* newspaper. As noted in section 1, the Cutler report (2008) noted the issue in passing. The Bradley (2008) report did not address the issue of internationally comparative research performance, which was remarkable given the discussion of this issue in other national jurisdictions in the wake of global rankings. Australian policy makers seem reluctant to begin a discussion which might legitimate claims for additional or more differential funding for basic research.

5. Internationalisation as strategy

- *What is the strategic importance of internationalization and how will the strategic importance evolve? Is there an "appropriate" scale of internationalization? For example, what is the desirable proportion of international students or faculty members in a university? And what is the impact or strategic importance of internationalization in the area of research?*

5.1 Global overview

Strategies for enhancing national competitiveness in the global environment: Certain nations and institutions are notably effective in the global knowledge economy. Among national higher education systems, we can identify among others the USA (if US higher education can be characterized as a 'system', in the absence of some of the defining elements of a system) and the UK; the 'junction states' of Switzerland and Singapore; and Denmark and Finland. Among institutions, there are stand-out research universities that have focused on building cross-border skills, knowledge and sensibilities and are active in the international setting at a high level of engagement and effectiveness, such as (to take some of the many possible examples) the London School of Economics, the University of Illinois in the USA, Leiden University in the Netherlands, the National University of Singapore and Tsinghua in China. What are the characteristics of these cases? Each has distinctive features, but in sum we can say that global effectiveness is associated with:

1 *Resources and conditions:* Elements within the control of nation/institution that are necessary to both underpin proactive cross-border activity and attract the attention and support of other national systems and institutions (these include the elements of national investment, basic research and a competitive level of participation in tertiary education: see previous sub-section);
2 *Awareness of global context and sense of global position:* An informed understanding of the global higher education context and of the main trends shaping and changing that context. Awareness of the position of the national

system and/or institution within the global context: its geography and history, its resources and how they can be used, its competitive advantages and disadvantages, strengths and weaknesses, possible strategic options;

3 *Global mission and strategic capacity:* A strong sense of the national and/or institutional mission and project within that global context, grounded in a broad-based consensus in the nation/institution, with well defined (though not unchangeable) global objectives. An effective set of strategies for pursuing the global mission, the capacity to hold focus on the key objectives, and the capacity to respond flexibly and quickly to opportunities;

4 *Connectivity and the degree and quality of internationalisation:* The all important capacity to engage and connect across borders in a sustained manner in different parts of the world, especially those relevant to the global objectives, making the best use of position and resources. Effective internationalisation as required.

Resources and conditions for global effectiveness: The principal policy message of the OECD since the mid 1990s and in more recent years the World Bank, is that global trade and economic competition between nations is increasingly focused on knowledge-intensive production, and is therefore vectored by first mover advantages in innovation, responsiveness and adaptability. This means that higher education and research are now situated in the framework of innovation policy and national innovation systems, and in future will move closer to the centre of national policies to secure global competitiveness. When economic competition takes place on the basis of ideas, expertise and behaviours, comparative advantage is not dependent on resource holdings or inherited traditions. It can be created by investments in education and research capacity, migration policies, and policies at the junction between the creation of ideas, applications, and business organization. In sum, three sets of resources and conditions are primary in determining the global effectiveness of national systems and institutions: national investment in education and research, basic research capacity, the level and quality of participation in education.

In international discussions of global capacity, much of the emphasis falls on levels of national investment in higher education and research. In part this is because national investment is readily measured in comparative terms (see above, Table 3). The counter argument from those who resist the increase in fiscal load, is that spending in itself does not deliver results and that other changes are needed to secure global effectiveness. Both arguments are correct. The level of national and institutional investment in k-economy institutions and activities – investment both in general, and investment specifically in relation to global activity - is a necessary but not sufficient condition of global effectiveness. More needs to be done than simply invest in education and research. If the mix of incentives and organizational cultures works against global connectivity then additional capacity will be wasted. Further, in a number of ways systems and institutions can lift their global effectiveness without spending more; above all by developing greater mission coherence and better strategies. At the same time, experience shows that long-term improvements in global effectiveness cannot be secured without a substantial investment in k-economy capacity. All the global leaders are notable for either the level of their investment in knowledge in general (e.g. the United States) or specific to research (the UK). The

emerging powers in the knowledge economy are investing heavily from public sources. Targeted resources can open up a broader range of strategic options.

In building capacity in the knowledge economy the most significant form of funding is the level of investment in autonomous basic research in universities, research institutes and government sector laboratories, as was discussed in section 1. Research power is at the heart of the capacity to interpret and utilize open source knowledge flows and the capacity to create at the cutting edge of the knowledge economy. Nations without creative capacity of their own are decisively limited in their ability to use knowledge sourced from elsewhere. All successful k-economies carry a research system across the main fields of knowledge and inter-disciplinary activity, encompassing a mass of established and emerging researchers of high calibre across this range of fields of research, including the emerging areas of strategic significance, the necessary equipment and computing capacity; and a mass of internationally significant research and publications outputs. With such investments the lead times are long but patience will be rewarded. *The point cannot be over-emphasized. Building stronger basic research is the most important single strategy in lifting the global effectiveness of a national higher education system.*

The other factor at the core of national capacity in the global knowledge economy is the level of education and training in the population, especially the working age population. This goes to both the rate of participation in education at different age levels (see above, Figure 2). The innovation policy agenda implies the extension of educational participation across the population and up the age structure.

Awareness of global context and sense of global position: Within the global higher education landscape, nations and institutions are both 'positioned' and 'position-taking' (Bourdieu, 1993). Nations and institutions are positioned by their inherited characteristics, including the size, shape, skills and organizational cultures in their education and research systems. These elements create possibilities in the k-economy but there are also limits to what institutions and nations can achieve. In the short term they must do what they can, with what they have. In the longer term they can augment global capacity at least in some respects by their own efforts in building capacity and connectivity. Raw national and institutional potential in higher education is framed by such elements as the size and wealth of the economy; the systems, resources and techniques of government; cultures and languages; the skills and talents of people; and the inherited educational system itself and its academic cultures, including the size and resources of the national system and of institutions, rates of participation and the quality of students and programs, and research capacity in the different fields of inquiry. It is also shaped by history and geography, by the long-standing patterns of international relations in place and the scope and limits created by geographical position.

Nations need to work to their strengths and limitations. Every position within the global landscape suggests possible global position-taking moves that correspond to it. For example nations that have inherited a strong research base can more readily develop themselves as providers of international doctoral education. High quality vocational institutions in Germany or Finland can readily play an international role in

industry training. English-language nations can readily create an education export industry, because English is the sole global language, and so on. Nevertheless, path dependence and context effect are not absolutes. In the global k-economy there is much scope for imaginative strategy and for capacity building that will open up future strategic options. The global dimension of action is larger, more changeable, more open, and less bound to habit and tradition and the established map of power than is the national dimension of action (Marginson, 2008). Not only are there are a host of possible networks and other global strategic permutations, in a fundamental sense the possibilities are broader and the outcomes less determined. For example, national institutional hierarchies are fairly stable with little room for upward mobility especially at the top. However, second level institutions can build a new role through global production and alliances. In turn these institutions can leverage their global role to elevate their standing in the nation of origin, indicating also how the openness of the global environment has the potential to destabilize inherited certainties back home. Within the global setting whole national systems also have scope for global upward mobility, as Singapore has demonstrated by reinventing itself as a k-economy.

Although size matters in the global k-economy and only very large nations such as the USA and China have potentials to exercise hegemony on a global scale, small and medium size nations have many strategic options and can play key global roles. Singapore is one such case. There a superior reading of the global setting and its possibilities enabled the island state to design a cutting edge strategy and trajectory. Israel, Switzerland, Sweden and Finland, all relatively small in terms of population size, have built superior research and university systems that position them well in the present era. The UK, with a relatively modest level of national investment in higher education as a proportion of GDP (though targeted investment in research is higher in comparative terms), is currently world number two in research and its dissemination; and the quality of its institutions sustains it as a strong exporter relative to its size in terms of both international student quality and international student volume. The old empire is not dead, at least in the form of the empire of the mind. In the knowledge economy UK higher education punches far above its weight.

Global mission and strategic capacity: The above argument suggests that global mission should be grounded in both an informed reading of the global setting and an awareness of the position and positional options of the nation/institution. The more difficult question is implementation. This is shaped by government-institution relations, and internal organizational structures and cultures within institutions. Here global effectiveness requires a combination of qualities which some might see as paradoxical: on one hand executive acumen, the capacity to mobilize resources, and cultural coherence; on the other hand freedom of action. This combination is essential at both system level and institutional level. For a national system to be globally effective its institutions need to pursue extensive direct dealings across borders because only free global relations enable them to develop the necessary understanding and perspective, formulate innovative missions and open genuinely new markets, identify the range of opportunities in front of them, and learn to respond quickly and seize the initiative. It is essential that institutions are free to build collaborations without reference to government; though from time to time government may intervene by providing incentives to kick-start certain forms of cross-border

activity. At the same time national system effectiveness in the global setting will be furthered when institutions manifest a common approach to the global possibilities and a sense of national identity. This does not mean that the system settings should hold institutions to one common mission template – to do so is to radically reduce the capacity to develop and exploit the possibilities offered by the global setting – but that each institution's efforts should contribute to common goals and that the global dealings of each should provide more favourable conditions for the others. American universities exhibit a strong sense of cultural coherence when they operate abroad although, as noted, they are not explicitly steered by government in doing so. China's universities carry a coherent national mission in their relations with the rest of the world, joined to growing capacity in autonomous cross-border action.

At the institutional level the same logic applies. Conditions of academic autonomy, and academic units with the positive capacity to build linkages across borders without reference to central decision-makers or resource allocations, are at the core of the global effectiveness of higher education institutions. Their academic units must be as free to relate as to create. Often the two go together. Academic freedom is essential because research and knowledge are the building blocks of the k-economy and they can only fully flourish in conditions of academic freedom; but more than this, it is also a question of the limits of executive action. In the open source global setting no executive leadership, however good, can read the map of opportunities and possibilities in one particular domain of knowledge better than can the leading specialists in that domain. At the same time an advanced capacity in executive strategy making and resource management, especially the capacity to shift resources quickly as new priorities emerge in the fast-changing global setting, is at the heart of nearly all the major global institutions. The National University of Singapore is a by-word for the nimbleness of its decisions. The best US universities are notable for their capacity to combine academic freedom and decentralized initiative with executive steering and centralized intervention, enabling them to concentrate resources in key fields and projects. There are cross-cultural tensions in the arrangement; ritualistic mutual denunciations of 'the administration' and 'the faculty' come with the territory; but at best both parties share an enterprising outlook in the face of the global, a close awareness of goals and outcomes, and recognition that each needs the other.

Connectivity and the degree and quality of internationalisation: Global connectivity is instrumental capacity in cross-border relations, or 'international' relations. A working definition of 'internationalisation' is the furthering of global connections. Summing up, the potential for success in the global environment is determined by two elements: capacity and connectivity. Capacity is national or institutional fire-power, the extent of the concentration of resources and the power of attraction within the global landscape. Connectivity facilitates global action and opens up possibilities. It can further strategies of both cooperation and competition. Often of these modes of relationship are pursued at the same time. Global competition in relation to both research and export programs involve continuous international collaboration and networking. The most globally successful nations in the knowledge economy are nations that manage their cross-border relations well and to mutual advantage.

Connectivity has a number of aspects. First, there are the tools of connectivity, which are communications/information systems and capacity in foreign languages. IT connectivity is typically measured on a comparative basis by such indicators as rates of broadband Internet connection and computer use, bandwidth, and mobile phone incidence; and by the unit cost of the different forms of connection (the cheaper the cost the higher the potential connectivity). There are parallel measures of the use rates and costs of cross-border travel. Language capacity is readily measured by the number of speakers of the language in question within the population, or the higher education system. Global effectiveness requires a broad-based capacity to use English at professional and academic levels, together with partial capacity in larger language groups such as Spanish/Portuguese, Chinese, Arabic and French; and in Asia Indonesian/Malay, Japanese, Korean and perhaps Thai and Viet. Second, connectivity requires national and institutional systems and processes that synchronize effectively with significant other parts of the world. For example cross-border people mobility is facilitated by a structure of academic programs and a degree map sufficiently synchronous with major systems such as the North American, UK and European, and as far as possible the various systems in East Asia, South Asia and Southeast Asia. More directly, mobility is sustained by recognition and accreditation protocols, and a credible national system of quality assurance that can serve as proxy for direct judgments by foreign governments and institutions. If the different national quality assurance systems talk to each other, so much the better.

Third, connectivity is advanced by measures and conditions that facilitate inward mobility of students, academic staff and other researchers (see below). One key is conditions of work and life sufficiently attractive to foreign staff and students; for example the precinct quality of cities, cost of living, housing and transport, safety and intercultural relations. Another is the set of financial incentives directed towards attracting and holding foreign talent, such as the number and level of doctoral scholarships for international students, and the provision of special salaries and job conditions packages for ‘high-flyer’ researchers. Do institutions have the financial capacity and transparent freedom to appoint on merit? A further consideration is the immigration regime and the academic career system. Do they facilitate the appointment of foreigners on merit? How quickly can foreign researchers secure equivalence with their local counterparts? The global rankings position of the nation and/or institution, in comparative measures of performance in research and scientific publication (the appearance if not substance of k-economy knowledge power), also affects the capacity to attract offshore talent. Fourth, connectivity is advanced by initiatives that facilitate outward movement of students, staff and researchers. This is an active site of policy in Europe and in emerging national systems that utilize foreign doctoral training. Up to now it has been less significant in Australia and the USA where most people movement in higher education is inwards rather than outwards. Relevant programs include subsidies allocated to cross-border research training, academic visits, research collaborations, student exchange and students who complete whole degrees abroad. Like inward people movement, outward people movement can be monitored by measuring the volume and national identity of journeys, research collaborations and migration.

Fifth, connectivity is furthered by cross-border partnerships, consortia, networks and other forms of institutional alliance; by intergovernmental protocols and other forms of cooperation in the field of higher education; and by common trade regimes such as WTO/GATS where they facilitate freedom of people movement and business activity. Finally, there is an element difficult to define and measure but one that is often key to imaginative global strategies. That is the extent to which a spirit of sympathetic global engagement is manifest in the national system or institution. This requires a genuine curiosity about others and willingness to learn from them, as well as the tools of engagement such as language competence and IT connectivity. As more nations develop a strong sense of the global context and strategic space, and become engaged in continuous investments to lift k-economy firepower, the cutting edge of global competition will shift to adding value and building comparative advantage via finer-grained and tailored investments and strategies. In cross-border relations there will be growing emphasis not just on lifting the amount of connective activity and creating alliances but on depth of connectivity and partners of lasting value. This will foreground language competence and empathetic capacities.

Global people mobility: Mobility of personnel has long stimulated partial global convergence in education and research; and the extension and intensification of global people mobility is a principal aspect of the present period (Guruz, 2008). Data collected by the American National Science Board in the USA reveal an almost universal trend to growing cross-border collaboration in research (NSB, 2009). This is confirmed by individual country studies in Europe and elsewhere (e.g. those collected in Enders and de Weert, 2004). In the last two decades there has been significant growth in short term cross-border movement for academic purposes; research, conferences and short exchange visits; and recruitment and teaching in the cross-border degree market (OECD, 2004a). At the doctoral level many governments subsidize foreign PhD experience. Some universities that once recruited all doctoral candidates locally are now active on the national and the international planes (Enders & de Weert, 2004, p. 146). The English-speaking countries and some others have 'relaxed their immigration laws to attract qualified and highly qualified foreigners, including students, to sectors where there were labour shortages' (Tremblay, 2005, p. 197). There is also an emerging global competition for post-doctoral researchers.

Is academic mobility confined to cross-border passage between national labour markets or has globalisation promoted a distinctive global system of R&D labour as the OECD has argued (2004b), partly subsuming national labour markets? National academic career traditions are robust and often distinctive, particularly in larger self-sufficient systems such as France and Germany (Musselin, 2004; 2005). In some European systems it is almost impossible for non-nationals to establish a permanent position. The last applies also in Korea, Malaysia and Thailand. National academic career structures are more conservative than those of many other professions, as indicated also by the slow feminization of the professoriate. Despite these limitations the global element of academic labour is growing and parts of it are pushing beyond the logic of national systems. Some academic staff have expertise and reputation that confers superior opportunities in many countries, including researchers at the peak of their fields and globally transferable teachers in finance, accounting and, until recently, computing. Global researchers are strategic for national governments and research

universities, with the potential to augment both the national innovation system and the position in university rankings. It is important not to exaggerate the size of the global pool. 'One can expect international careers to primarily include a few top academics. Most others, and especially young candidates, still develop national careers' (Musselin, 2004, p. 72), with or without international experience.

A global mobile pool of high quality researchers does not in itself constitute a single global labour market with standardized conditions, remuneration and career structures. Rather, we have an American labour market that is global in reach and sets upper benchmarks for salaries and research infrastructure. Other national research systems are pulled towards the American benchmarks by market pressures, stratifying the academic professions between a small globally mobile upper segment and the much larger group of nation-bound researchers. Singapore has set out to create a globally competitive higher education system with expatriate faculty paid at US levels. In China some academic salaries are now globally competitive.

The worldwide number of cross-border foreign students ('international students' in the OECD definition) is growing at 8.4 per cent per year and reached 2.9 million in 2006, up from 0.6 million in 1975 (OECD, 2008c, p. 353). The OECD notes that between 2000 and 2005 the number of foreign students in OECD countries rose 49 per cent, which was much faster than the increase in total numbers of tertiary students, 21 per cent; though this overall growth in international student mobility has affected countries differently Global student mobility is driven by the globalization of job opportunities and educational provision, by migration, and by policies in sending and receiving nations that encourage mobility. Almost half of all cross-border student movement is out of Asia to English-speaking nations and Europe. One quarter is internal to Europe. As noted, there is growing movement within Asia. Student mobility has been facilitated by structural changes in degree programs and qualification systems, and the increasing convergence of national and European-wide recognition and quality assurance systems. Two main templates for first degrees have emerged; the four year first degree in North America and China, and the three year first degree in Europe/UK and Australia. The three-year model is premised on a longer time spent in secondary school, an older cohort and arguably a higher level of school preparation, than applies in the USA. In contrast to the first degree level, little worldwide standardization of the Masters degree is evident. However at doctoral level there is increasing worldwide interest in the American form of doctoral education, with its program of coursework and extended preparation prior to the research thesis.

Partners and consortia: An obvious response to globalization is the extension of formalised international cooperation to higher education institutions in other parts of the world. Many institutions invest executive time in creating bilateral agreements and a smaller number have joined cross-border consortia in which the members engage with multiple partners. International agreements are designed to secure quasi-concentration benefits in research, privileged routes of student passage, perhaps jointly badged degrees, on-going staff exchange, transferred prestige, or simply the appearance of being internationally engaged. Some partnerships and consortia lead to tangible, ongoing activity of importance to all partners, for example in student exchange. Institutional partnerships have been instrumental in the commercial degree

market, such as ‘twinning’ programs whereby students complete one part of the degree at home and the other part in the export nation. Many academic visiting and research cooperation falls outside executive-led institution-to-institution partnerships. Often more energy goes into the negotiation of partnerships than their implementation, and there is a lack of clarity about objectives and about how the partnership will add value to each partner. Formal partnerships play a more important role in teaching than in research. For example many British and Australian institutions have developed ‘twinning’ partnerships with Asian-based institutions, whereby the student does one or two years of the degree in the home country before moving offshore for the remainder. As well as facilitating international marketing, twinning encourages a partial convergence of curricula and assessment. A small number of institutions make particularly effective use of the network mode. The National University of Singapore (NUS) has built a range of active partnerships with major institutions in Asia, Western Europe and the English-speaking countries, in both education and research; plays a leading role in consortia such as the Asia-Pacific Rim Universities; and hosts regional and global meetings.

Cross-border mobility of institutions: The cross-border mobility of institutions, whereby they establish branch campuses in other countries, brings a foreign provider education into the student’s home nation. This mode of cross-border education, in which the institution is ‘foreign’ to the nation in which provision takes place, rather than the student being foreign, has grown rapidly (Verbik and Merkley, 2006; Ziguras and McBurnie, 2007). For receiving countries foreign cross-border institutions offer a low cost opportunity to expand local higher education capacity and are deployed as a modernising force. There are two main modes of cross-border institution. One is the stand-alone campus owned and built by the foreign provider. This involves often complex negotiations with local authorities, and is expensive and must be financed from home, but enables full quality control over the education and engagement in the local system. The more common model is franchising with a local partner as provider. This is cheaper to provide and may generate greater revenues. But franchised campuses are difficult to control from home base and may vary downwards from the standards of the home country degree, and business collapse. The curriculum and assessment standards of the two partners are not always as well integrated as is the case with twinning. Franchising involves reputational risks for the foreign providers.

The nations most active in cross-border institutional mobility are the USA, Australia and the UK. European higher education is yet to fully explore this mode of engagement but some European institutions run study centres and other nodes of activity abroad. Singapore has made the inward mobility of foreign providers a core element of local educational provision and global strategy. India has now become a key zone for foreign providers of both university and vocational qualifications, even though private and foreign institutions are formally prohibited in much of the country. Cross-border institutions are not confined to the middle level and emerging economies. There are a number of American providers operating in Western Europe, mostly in business education. Carnegie Mellon has an Australian business school supported by the South Australian government. Charles Sturt University has a teacher training campus in Ontario, Canada. Table 12 from Verbik and Merkley (2006) provides a list of stand-alone branch campuses by provider nation. This excludes

franchising. Despite the best efforts of the researchers, it is probable that the list is not fully comprehensive. e.g. there are no institutions listed for India.

Table 12. **Transnational branch campuses, by provider nation, 2006**

provider nation	international branch campuses	locations
USA	44	Qatar (5), China (4), Canada (3), Emirates (3), Jordon (2), Mexico (2), Netherlands (2), Singapore (2), UK (2), Czech Republic, Ecuador, France, Germany, Greece, Hungry, Israel, Italy, Jamaica, Japan, Panama, Poland, Puerto Rico, Switzerland, Thailand
Australia	10	Malaysia (3), Singapore (2), Canada, Emirates, Fiji, South Africa, Vietnam
India	5	Emirates (4), Singapore
UK	4	Emirates (2), China, Malaysia
Canada	3	Emirates (2), Qatar
Ireland	2	Malaysia, Pakistan
Netherlands	2	Qatar, South Africa
Pakistan	2	Emirates, Kenya
Philippines	2	Vietnam, Indonesia
Belgium	1	Emirates
Chile	1	Ecuador
France	1	Singapore
Italy	1	Argentina
Korea	1	Vietnam
Sweden	1	Russia

Source: Berbik & Merkley, 2006, pp. 25-30

The institutions involved in branch campus activity range from fully commercial providers such as the University of Phoenix, to second sector public institutions, to the one third that are established research universities. In addition to the Australian providers (Charles Sturt, Central Queensland, Curtin, Monash, Swinburne, James Cook, New South Wales, RMIT and Wollongong) they include the University of Bologna (in Argentina), Seoul National (Vietnam), the University of Nottingham (China and Malaysia), Johns Hopkins (China and Italy), Columbia (Jordan), Harvard Medical (Emirates) and the Chicago School of Business (UK). In 2006 there were 14 institutions in the Emirates, seven in Qatar, six in Singapore and five in China.

Unlike education provided to foreign students within the export nation, the cross-border mobility of institutions encourages hybrid approaches that combine the educational traditions of the exporting nation with those of the importing nation. Unlike Internet-based degrees, which can be accessed almost anywhere regardless of the policy in particular nations, offshore campuses depend on the cooperation of the country concerned and are subject to local registration, accreditation and quality assurance protocols. Transnational programs supplement rather than replacing

educational provision in the nation in which they are provided. Sometimes there are stipulations as to the educational program. Cross-border mobility of institutions is transformative at one or both ends of the relationship (Ziguras and McBurnie, 2007). Cross-border institutional mobility will be the site of many future innovations, and is likely to grow significantly in the number of sites and volume of students, and will continue to involve both research universities and teaching only institutions.

Futao Huang (2007) notes that there is ‘great diversity in the legal status' of transnational higher education (TNHE) in the different countries of Asia.

> In most cases, incoming foreign institutions are regarded as part of the private sector. Malaysia and Korea offer clear examples. By law in Malaysia, foreign providers wanting to offer transnational courses can either apply to be licensed as a private higher educational institution and open a branch campus or deliver courses through a local partner licensed as a private higher educational institution (Morshidi, 2006). In contrast, in China there is no available document that clearly defines the legal status of incoming foreign programs, especially joint degree programs in cooperation with foreign partners on Chinese campuses. Also, current government policy documentation does not show whether these programs belong to the public sector or the private sector. These joint degree programs are provided exclusively in the Chinese public sector, more specifically in prestigious Chinese national universities, but in many respects they are operated in a totally different way from normal programs even in the same institution. As a new form of higher education activity, deciding how to legally position the programs remains a big issue for the central government … Similarly, in Japan, until 2005, education authorities had approved none of the branch campuses of foreign institutions as formal higher education institutions, so it was not possible for them to acquire the status of a “corporate school” like private higher education institutions in Japan. The vast majority of these branch campuses were established as “corporations” instead of “educational organizations.” It was not until early 2005 that incoming foreign higher education programs and institutions, including branch campuses of American institutions, finally received official recognition from Japan’s Ministry of Education, Culture, Sports, Science, and Technology (MEXT) as foreign universities in Japan.
>
> The role of TNHE in national higher education systems is closely connected to the differing legal arrangements for TNHE in individual countries. For practical purposes, two major types of incoming foreign higher education services in Asia can be identified: an incorporated/domestic-oriented type and an extracurricular/overseas-led type. In the former, incoming foreign educational activity has the ability to cater to the domestic market and it is better able to contribute to national economic development and internationalization of higher education in the host country. It constitutes an integral part of the national higher education system and is officially incorporated into national provision of university education, contributing more academic and professional programs. It is also strictly monitored and regulated by national legislation and policy in the host country. A majority of countries, including China, Malaysia, and Vietnam,

> clearly conform to this type. In the second category, incoming TNHE services are not recognized as an integral part of the national higher education system of the host country, they are merely regarded as extra university activities, totally separated from the national higher education educational activity. This category is responsive to market forces and primarily operates through market mechanisms. Because this type of incoming TNHE activity is not considered to be part of the national higher education system, it can only provide preparative education or general study for local students that may facilitate their subsequent pursuit of higher education either at home campuses or abroad (Huang, 2007, pp. 425-426).

In China, transnational higher education refers to ‘the joint operation of higher education institutions with foreign partners and collaborative delivery of educational programs’ as well ‘outgoing programs that are offered by Chinese universities in other countries’. This includes ‘incoming foreign programs that are provided jointly by Chinese universities and foreign partners in Chinese universities’. The transnational programs now provided by foreign institutions in China ‘consist of two types: non degree-conferring programs and degree programs leading to degrees of foreign universities or universities of Hong Kong’. Transnational higher education has moved from ‘an incidental, informal and laissez-faire phase that lasted until 1995 into the more structured, systematic, well-supported, and regulated current phase' (p. 427).

> In the initial stage, the development of transnational programs, and in particular educational programs leading to foreign or Hong Kong degrees, were strictly controlled and regulated by government. After the statement on “Contemporary Regulation on Operation of Higher Education Institutions in Cooperation with Foreign Partners,” issued by the former State Commission of Education in 1995, there was a surprisingly rapid expansion in the number of these joint programs, especially those with authority to confer foreign degrees. For example, in 1995, there were only two joint programs that could lead to foreign degrees; by 2004, the number of joint programs provided in Chinese higher education institutions in collaboration with foreign partners had reached 745, and by June 2004 joint programs qualified to award degrees in foreign or Hong Kong universities amounted to 169 ... In general, these joint programs, and in particular programs leading to qualification for a degree from a foreign or Hong Kong university charge tuition fees of up to or even greater than five times those of local institutions. However, there exists an enormous market for these programs and, even more importantly, they are strongly supported by the Chinese government.
>
> One of the striking characteristics of transnational programs in Chinese university campuses is that the vast majority are concerned with professional education. For example, although there are numerous programs in engineering, computing, information science, and English language, the majority belong to the fields of business and management studies that prepare professionals for work in multinational corporations or in firms engaged in international commerce. Almost all of them are provided in China’s most prestigious universities. This may be one of the most important reasons that these joint programs have been able to attract a steady increase in students over the last decade. With a rapid

> expansion of joint programs, more and more research universities from foreign countries, and particularly prestigious universities from the United States, Australia, and the United Kingdom, have participated actively in offering various degree programs in cooperation with Chinese institutions. This has been a major factor in attracting more students into the joint programs in China. By 2004, joint programs with Australian universities especially, had surpassed those with U.S. institutions…
>
> Several factors have led to the substantial increase in the number of TNHE programs in Chinese universities. Two reasons are of particular importance. First, it is widely expected that integrating foreign educational programs into Chinese campuses will provide a practical and also a very efficient way to improve academic quality and standards, as well as facilitating internationalization of Chinese higher education. By undertaking joint programs with prestigious foreign partners, individual higher education institutions in China can obtain a full and direct understanding of current educational missions, standards, ideas, curriculum management, and delivery of educational programs in foreign universities. Second, by introducing those programs that are urgently needed but cannot be provided by Chinese institutions, China can train more graduates with international perspectives in a faster and more efficient way (Huang, 2007, pp. 427-428)

In addition China has a growing role as an exporter of transnational education:

> It is also important to note that in recent years, a great effort has been made by the Chinese government to provide a Chinese higher education service for local students in foreign countries. Although the number of degree-conferring programs offered outside China is much smaller than the number of TNHE degree programs provided on Chinese campuses, rapid progress has been made recently. For example, Fudan University in Shanghai and Singapore National University have agreed to establish branch campuses in their respective universities and to undertake cooperation with each other in recruiting students and by mutual recognition of some curricula, credits, diplomas, and degrees (Huang, 2007, p. 429).

Bashir (2007) notes that China is much more active in receipt of transnational provision than is India. Her paper carries data on the phenomenon worldwide. She notes that ‘twinning and franchising arrangements clearly predominate… branch campuses are far fewer in number’ (Bashir, 2007, p. 30). Some transnational sites cater mainly for local students, others for foreigners, and a further group mixes the two groups freely. One example of the second form is in the Caribbean, where there are 38 institutions offering courses in medical, veterinarian and health sciences programs ‘that allow students to take the US Medical Licence Examinations’. ‘Essentially this model consists of the “offshoring” of US medical education to produce medical graduates at lower cost for the US market’ (p. 31). The English language countries dominate in transnational education but France, Germany, Russia; Scandinavian countries in the Baltic states; and institutions from India, China, Malaysia and Singapore are also transnational players (pp. 31-32). Latin America has

many franchising and twinning partnerships involving US or European institutions. The outward transnational strategies of universities and other institutions depend in part on their own status. Newer, less prestigious institutions may be flexible in devising franchised and articulated programs in other nations, often with revenues in view; leading research universities are more likely to opt for stand-alone branch campuses and partnerships with top ranking domestic universities (p. 32).

Global hub strategies: Global hubs are designed to position a particular national system or city as a pole of attraction and capital accumulation, centred on its education and research activities. The aim is to divert part of the global flows of talent, knowledge, ideas, technologies, fee paying students and capital investments in knowledge through the hub; and to wrap around the hub a larger set of industries such as tourism, knowledge-intensive manufacturing and perhaps financial and regulatory services. Typically, government invests in infrastructure and offers favourable terms to foreign providers who may wish to locate onsite. The classic hub is seen as a medium of modernization that will position the nation or city as a centre of global and regional development. The first and only real knowledge hub so far established is Singapore but there are many would be imitators.

For Singapore the hub strategy has a special importance because of the island city-state's dependence on the global sphere of action. Singapore has a population of just 4.8 million. It has built a Western European level of per capita income as a transport and trading economy with advanced manufacturing and financial services. It is one of the world's busiest ports and sustains a high volume of currency dealings and other financial transactions. Manufacturing industries include electronics, petroleum refining, chemicals, mechanical engineering and biomedical sciences. The only wealthy economy in Southeast Asia, Singapore has positioned itself as regional centre and broker and often hosts pan-Asian organizations and meetings. Its ambition is to broker international dealings on a global scale and it emphasizes links into Europe and the Americas as well as different parts of Asia. The capacity to leverage global mobility, and the capacity to manufacture and renovate social and cultural relations, are at the heart of the Singapore project. It is friendly to foreign businesses and to tourists. Regulation is enabling, subsidies for industry and universities are designed to attract and hold, the civic services are well organized and urban precincts are transparent, safe and clean. Now Singapore's formidable powers of self-invention have been devoted to turning it into the quintessential knowledge economy.

Singapore's planners believe its survival and prosperity depend on 'establishing high value industries and services such as design and engineering, education, communication, marketing and management' (Sidhu, 2009, 128). There are global hub strategies in several areas in addition to education and research, including financial services; medical services; creative industries in the arts, media and communications; conventions; and tourism. Singapore sees the knowledge industries in parallel to other, familiar, global-forming and globally-formed industries such as transport and finance. In what Singapore calls its 'Global Schoolhouse' strategy the nation invests in both its own knowledge infrastructure; and in the enticement of foreign universities and business schools on the basis of medium term partnerships. It is hoped that the creation of a zone of institutions with world reputations will draw a

strong flow of fee paying international students of good quality, particularly from China, and also firms interested in the potential for commercialisable intellectual property, especially in electronics and biomedicine; and the presence of foreign universities of quality will drive improvements in Singapore's own institutions. Amongst the foreign institutions that have set up shop are Wharton, the leading business school in the USA, the Chicago Business School, the MIT research laboratories, the leading European business school INSEAD, the Technical University of Eindhoven in the Netherlands, and Munich University of Technology from Germany. The Schoolhouse strategy is state-dependant but it is also flexible, in that the city-state has the option of scaling down foreign involvement at a later time, thereby shifting the balance more towards locally-controlled activity. In Singapore there is also now 'greater recognition that for Singapore to meet its knowledge economy aspirations, the development of indigenous capacity in entrepreneurship and technological innovation is vital' (Sidhu, 2009, 131).

> In the Global Schoolhouse, we have a state-sponsored project devised to establish a 'knowledge and education hub' which attempts to brings together *networks* of ideas, knowledge, technology, and world-class universities, aligning them with the professional aspirations of people who are anticipated to contribute to Singapore's knowledge economy ambitions. The Global Schoolhouse, then, can be said to have multiple policy functions: it is anticipated to act as a magnet for other 'value' added knowledge-intensive services and industries; it is expected to attract high quality human capital-dubbed 'top talent' from all over the world' … it is also expected to set world-class standards for local universities and local staff. The policy approach to leverage off the branding potential of a group of renowned foreign institutions ('World-class Universities'), extended to the provision of government support to establish centres of excellence in research. It was anticipated that these centres would link up with domestic industry and MNCs with a regional and Singaporean presence, as well as local research institutes to establish a self-sustaining 'research ecosystem'. Only 'high quality' institutions were invited and supported… (Sidhu, 2009, p. 129).

Sidhu notes that 'global knowledge spaces such as the US$ 300 million Biopolis (biomedicine) and the Fusionpolis (IT and creative media) draw inspiration from the cluster technopoles of Silicon Valley and Route 135' (Sidhu, 2009, p.131). There is talk of Singapore becoming a 'Harvard of the East'. Negotiations with each of the Universities of Warwick in the UK and New South Wales in Australia, to create a large-scale campus focused on fee-paying international students, came to nothing, but research partnerships are simpler to organize because the funding of research activity is unequivocally dependant on government, in this case Singapore. Foreign research partners are required to make only modest financial commitments in exchange for up front subsidies and can bid for Singapore research funds. In the case of Johns Hopkins, where the partnership collapsed, the American university committed just $60,000 to the establishment of the Johns Hopkins Medical School in Singapore. Singapore spent about $53 million USD (pp. 132-133). A key sticking point in partnerships and a potential weak spot in the hub strategy is the character of the foreign contribution, whether it is a peripheral international venture or the real

thing. The foreign branch campus must be as hard to enter as the home institution, the people it sends to Southeast Asia must be cutting edge, and it must be a magnet for talent in the manner of its parent. Singapore's local birthrate is below replacement and a primary aim of the Global Schoolhouse strategy is to attract expatriates especially people from the 'creative class' in Richard Florida's (2002) sense. Much thought in Singapore has gone into what constitutes a 'creative economy' and 'creative culture'. Planning focuses on forms of entertainment, stimulation and sociability that creative people are expected to enjoy. Singapore knows innovations are rooted in ideas and that synchrony across diverse fields can spark them (Kong, et al., 2006, pp. 177-181; Sidhu, 2009, p. 130). But rather than migrating permanently outsiders often stay for only limited periods. It can be hard to penetrate the inner circles in Singapore. The Global Schoolhouse might be too Singapore-enclosed.

Certainly, the Global Schoolhouse has not altogether worked as planned. For the foreign partners Singapore offers a favourable location for operations in Asia that is supplementary to core operations. For Singapore the Global Schoolhouse *is* core business. Thus Singapore has assumed most of the costs and risks, but in asymmetrical partnerships it can be difficult to align expectations. A persistent complaint in Singapore is that the foreign partners have not located their best work in Asia. In the case of Johns Hopkins 'a key point of contention' was the failure by the American institution to hire '12 senior investigators with international reputations to reside in Singapore' has had been agreed (Sidhu, 2009, p. 132). The Hopkins Dean of Medicine noted that persuading Americans and their families to relocate to Singapore was 'a challenge'. Singapore lacked the stimulation derived from proximate US health science and health services, and the research performance indicators set by Singapore were too inflexible. 'Hopkins [considers] serendipity vital to the scientific process' (p. 133). Similar difficulties have attended other partnerships. The bargains driven by Singapore in exchange for generous up front funding have proven hard to deliver, while Singapore has been overly focused on direct national economic returns for its investment in global education and knowledge. Singapore makes its partners offers that are too good to refuse, but partnerships also need voluntary synchrony.

It may be that the problems are fundamental in that they go to the heart of the particular hub strategy employed in Singapore. A study by Kong and colleagues of creative economy policies in Asia finds the Singapore strategy is 'non-spatial, or at best aspatial' (Kong ,et al., 2006, p. 137). There is little discussion of spatial configurations inside the city. The benefits of fine-tuning local proximity are missed. Sidhu notes the failure 'to translate the global imaginary into globalizing practices and outcomes' and suggests that factors of location and 'adjacency' have been underestimated. 'Pronouncements about the "end of geography" and the deterritorialized university… should be approached with caution' (Sidhu, 2009, p. 137). Both comments only capture part of the problem but they each point to something important. In Singapore the nation-state is the terminal point of interest, not the global. Hence the question of internal spatial configurations is underplayed – what is important is that the activity is located and controlled within the island and not outside it, not how the activity is arranged in relation to others in Singapore – while the potential of a well organized and financed hub to orchestrate global flows is overplayed, as if these flows can be altogether abstracted from their local/ national

determinants. Singapore does not enjoy the locational advantages of London or New York.. The would-be centripetal strategy of inviting the world to come to Singapore on Singapore's terms, with all the global distances seen as equivalent, has limited purchase. It could only work if the hub was already hegemonic. Only the US could achieve such strategy at this time. Singapore is not the United States, nor is it China. The more effective global strategy for a small to medium Southeast Asian power with advanced capacity would be to combine horizontal networking and a willingness to work with partners in their own domains as well as at home (that is, for Singapore as a whole to work in the manner of the national university); with a regional role that maximizes the potentials of 'adjacency'. The last suggests that Singapore's relationships with China and East Asia, India, Indonesia and its smaller neighbours are the main vectors of its future. As a regional hub embedded in the Asia-Pacific, not a de-territorialized local hub, it could maximize its global presence. But a larger regional strategy would require Singapore to embrace interests beyond itself.

Singapore's Global Schoolhouse has left a mark on policy thinking elsewhere. Malaysia wants to be a hub (Mok, 2009). There are many more. In early April 2009 authorities in the francophone island of Mauritius in the Indian Ocean announced that the carrying capacity of the University of Mauritius would be doubled, to 20,000 students, with the creation of a second campus. The Chief Executive of the State Land Development Company said that the new campus would be 'the most modern, and will meet the aspirations of the country to become the knowledge hub of the region'. The plan to transform Mauritius into 'a regional knowledge hub and a centre of higher learning' was part of the Tertiary Education Commission's strategic plan for the 2007-2011 period (University World News, 2009). In practice this is no more than building the export of education from Mauritius.

More weighty proposals for global hubs have emerged in the Gulf States. Like Singapore and unlike Mauritius governments in the oil exporting nations can invest at scale, though their capacity to do so rises and falls with the price of oil. Large-scale 'knowledge villages' have been created in Qatar, and at the two largest cities in the United Arab Emirates, Dubai and Abu Dhabi. Foreign providers have been invited in with offers they find difficult to refuse (see list in Table 12 above), supported by locally financed infrastructure, buildings and facilities. Compared to Singapore there is a greater reliance on the foreign providers and less on local k-economy capacity, less focus on research and development, and revenue projections are more dependant on the attractiveness of the hub to fee-paying international students. But being largely abstracted from the local setting – in fact the strategy is designed to secure a beach-head for modernization without directly confronting local tradition – the hubs in the Gulf cannot utilize 'adjacency' in their favour. In any case, Qatar and the Emirates do not offer the economic and cultural ambience of North America, Europe and East Asia; nor do they offer prospects of migration or the same range of business opportunities as Singapore. The hubs promise a safe environment to young students, and there is potential to build a market in Muslim countries, but it is unclear why other foreign students or scholars would want to travel to the Gulf State 'knowledge villages' unless there are overwhelming financial incentives to do so. At this stage the Gulf State hubs look likely to be education theme parks with a limited life.

There appear to be stronger long term prospects for the King Abdullah University of Science and Technology in Saudi Arabia, which is led by the former President of the National University of Singapore, Choon Fong Shih.

> The largesse available to KAUST, and the Singaporean influence on its development model, was also evident when it announced… that it was moving forward on substantial collaborative ventures, at an institutional scale, with the American University in Cairo, Hong Kong University of Science and Technology, the Indian Institute of Technology, Bombay, Imperial College London, Institut Français du Pétrole, National University of Singapore, Stanford University, Technische Universität München, University of California, Berkeley, University of Texas at Austin, and the Woods Hole Oceanographic Institution. These are substantial and lucrative linkages… with Berkeley's Mechanical Engineering Department (the lead linkage unit at Berkeley), for example, receiving US $28 million to participate in this scheme between 2008 and 2013 (Olds, 2008).

Regionalisation of higher education and research: The other move by governments in response to the new potentials of the global higher education environment is meta-national regionalization, as in the European Union and European Higher Education Area. Regionalisation depends on four conditions. The first is geographical proximity. The second is scale which is both a benefit and condition of regionalization. The third is a reasonable degree of cultural coherence. The fourth is the political will which is the hardest condition to achieve, and so far has only been achieved in European higher education. If they can achieve these conditions regions can replicate some of the advantages of major nations such as the USA and China, established polities with coherent national cultures and a sense of national will. The strategic question for meta-national regions is how to replicate these advantages, particularly that of coherence, without losing national autonomy and diversity.

The process of convergence in higher education and research that was touched off by the Sorbonne Agreement and the Bologna Accord, and confirmed in the Lisbon policies administered by the European Commission, has a momentum that appears deeper than, and has moved ahead of, Europeanization in the economy and governance, especially the latter. While it has proven difficult for the supporters of the European project to secure broad-based consent for constitutional forms and there is an abiding cynicism about 'Brussels', in higher education there is little opposition and much enthusiasm for the EHEA and the European Research Area (ERA). The head of the OECD's Centre for Educational Research and Innovation (CERI), Dirk van Damme, notes that: 'After almost 10 years, even its most ardent skeptics and opponents will recognize that the Bologna process has been the driver of a remarkably successful process of reform in European higher education' (van Damme, 2009, p. 39). The voluntary and consensual character of negotiations seems to have speeded progress. However, the UK is relatively detached from European convergence in higher education, just as it is ambivalent about the overall project of Europeanisation. Its presence in European higher education forums often appears nominal. For the foreseeable future British universities seem unlikely to undergo the cultural changes affecting their continental counterparts. There is a persistent feeling

in UK higher education that it does not 'need' Europe, and has a separate global role; perhaps in concert with the USA (though there is no evidence American higher education wants a special Atlantic partnership). European traffic into the UK may stimulate changes in the longer term.

Despite the caveat of the UK it would be a mistake to underestimate the degree of transformation entailed in Europeanization, and its longer-term global potentials. The membership of the EHEA is larger than the country coverage of the EU and there are pressures to join from beyond the borders of Europe. The degree of convergence in higher education varies between countries, and so far the process of change has gone furtherest in Northwest Europe and the Germanic countries, particularly the sub-region of Netherlands/ Belgium/ Flanders, and in the Nordic nations, than elsewhere. But the achievements so far are impressive (Marginson and van der Wende, 2007). In less than a decade a common template for degree length and nomenclature has been adopted in nearly all systems, and implemented to a varied but increasing degree. A standardized diploma supplement has been adopted in about half of all European institutions, so that there is a common European credential alongside institution-specific credentials, facilitating mobility. Inter-European student movement continues to grow though there are restrictions on foreign entry into some academic labour markets. Through the Tuning (2008) project European institutions have adopted common objectives for educational programs which extend to both discipline-specific and generic skills. As noted, a common European-wide system for classifying institutions is in preparation. The level of inter-European research collaboration has increased dramatically; the ERA is often described as the most integrated aspect of European provision. There is strong commitment to lifting national and regional investment in R&D, although the Lisbon target of 3 per cent of GDP by 2010 will not be met in all nations; and the global recession is likely to eat into research capacity. At the same time the European systems have retained their national autonomy and much of their cultural distinctiveness. A key strength of the European approach is the capacity to manage genuine diversity within a single framework. This is facilitated by the voluntary character of collaboration, including the implementation of common standards secured by 'shaming' of laggard nations rather than direction from above.

Most of the energy in Europeanization is focused inward and European nations are yet to reforge their global mission in the manner of Australia and UK in the 1980s or China in the 2000s. Many European institutions are not as comfortable in Asia as they are in North Africa and the Middle East, the old Roman Mediterranean zone. Bologna was conceived partly as a response to globalization but the EHEA does not yet have a defined global project and its concretisation may be some time off yet.

So far regionalization in higher education is little developed outside Europe. US universities ses no point in sinking part of their identity into a region with Canadian and Mexican higher education. Argentina, Brazil, Paraguay, and Uruguay have extended educational cooperation within MERCUSOR to other South American nations. This is the most active region outside the EHEA, strengthened by the shared Spanish/ Portuguese heritage. Southeast Asian nations in ASEAN are working on recognition, student mobility and cross-border staff exchange but these activities are marginal. Yet regionalization has much to contribute, especially in carving out a larger

role for the Asia-Pacific at the world level. A collaborative region with an element of common identity could achieve much that individual nations cannot. Region building offers to augment the capacity of both advanced higher education systems and under-developed ones. At a 28 March 2009 meeting in Beijing convened by Griffith University, which included experts on the knowledge economy from Asia-Pacific nations, it was agreed that regionalization was the chief available mechanism for developing the knowledge economy in the nations of the region;

> An initial phase should be the creation of an Asia Pacific Research Area, comprised of a commitment by regional governments, universities, and other research and teaching institutions to substantially increase research collaboration within the region. Initial impetus could be developed by focusing on building research programs around common challenges such as public health and environmental sustainability, and by identifying areas of easy and natural collaboration. In time, after the habits of collaboration have developed, more challenging areas of research collaboration can be addressed. New, global centres of research and higher education are arising in the Asia Pacific. To remain competitive in the global education sector, this region's institutions must learn to internationalise their teaching and research methods at the same rates that they are internationalising their student intakes. In addition to promoting the flows of students across national borders, we should also be promoting the flows of teachers and researchers across national borders in the form of genuine teaching and research exchanges (Wesley, 2009).

There are many ways to develop regionalisation in education and research in Asia, including a large-scale intra-Asian student mobility program along the lines of Erasmus in Europe, an East Asian or Asia-Pacific research grants program as proposed above, and a combined system for classifying and ranking institutions, which would facilitate recognition and accreditation, mobility and partnership building. Regionalisation not been seriously explored. This is a vacuum waiting to be filled.

5.2 Australia

Australia's sense of global self: Australia is a developed economy and society, middle sized in economic terms with a Western European/UK level of GDP per capita, enabling it to pursue a distinctive educational strategy and establish a specialized mission and comparative advantage by its own efforts. Arguably also, Australians bring with them to global relations in education the skills of solving problems and building new institutions, and sensible policy borrowing, which are the legacy of the settler state. These qualities have served Australian higher education well in developing the international education market. Perhaps there is less confidence in Australia in the capacity of the nation to compete in basic research, and a lingering provincialism in the isolation of intellectual cultures from Australian society. Australians have a fine tuned sense of differentiation from the UK and USA that has helped their institutions to position adroitly. Australian educators are less completely comfortable with their place in Asia but more so than is Australia as a whole.

Strong in exports but middling in research: In the cross-border degree market, in quantity terms Australia has built an exceptionally strong position in a short time. Compared to the USA and UK, Australia is well placed in relation to China and to Southeast Asia (though student entry from the latter sub-region has recently declined) but less so India and in East Asia outside China. Marketing and student servicing are highly competitive. The UK appears to hold an advantage over Australia in student perceptions of academic quality (UKCOSA, 2004: DEEWR, 2007) and the USA offers a larger set of educational and career opportunities. In the global competition in research and knowledge, Australia's position is that of a strong middle level player with potential to be something more, rather than a leading knowledge economy. This is reflected in, and powerfully reinforced by, Australia's position in the global research rankings. Australia's strength is a broad-based research capacity across higher education, with 15 universities in the Jiao Tong top 500, but Australia lacks the kind of truly stellar research universities that can act as powerful attractors in the global knowledge economy, especially in conjunction with global cities. The fact that Australia's strongest research university, ANU, is located away from the potential global cities (Sydney and Melbourne, and perhaps Brisbane and Perth in the longer term) reduces the long term strategic options. The downward pressures on basic research in the present system settings have negative long-term implications for research capacity in Australia. The inability to attract enough high quality international doctoral students and post-doctoral researchers is a primary concern for Australia.

Australian institutions are active in cross-border partnerships and consortia across all parts of the world, with a particular emphasis on agreements in relation to students in Asia and agreements on research in North America, UK and Europe. Comparative data on partnership agreements are lacking but records compiled by Universities Australia indicate rapid growth in such arrangements by Australian institutions. In Internet-based delivery, Australian institutions have been active in the development of prototypes. Innovations have been concentrated at the low unit cost end of the e-learning spectrum, where no institution anywhere in the world has built a strong model. Australia has had little presence in the high unit cost/ high quality and innovative end of the e-learning spectrum where institutions such as the University of Phoenix and the Free University of Catalonia in Barcelona have been pioneers. In the cross-border mobility of institutions, however, Australia has been a notable innovator. While not all of the Australian initiatives have been successful, much has been learned from experience; and the opportunity has been taken to engage closely with national regulatory systems and local environments in Singapore, Malaysia, Hong Kong and China. Australia institutions are second only to the USA in this field.

Australia has less presence in the government-driven strategies for enhancing global competitiveness that preoccupy many nations. It is not exaggerating much to say that government has focused on the export market and left other global dealings to the institutions. In Australia there is as yet little overt policy discussion of the implications of the k-economy for national policy, no program of accelerated investment in knowledge and participation, and no program to concentrate extra resources in selective research universities whether chosen arbitrarily or by competitive process. There has been some discussion in Australia of synergistic global knowledge

city/university development. This has been pursued on a relatively small scale, and by universities and city authorities rather than national or state/territory governments.

The low level of explicit educational contributions to the global public good is another concern. The transition to the market approach in 1985-1988 brought with it a near exit from aid programs. Ausaid is modest in scale in comparison with the educational aid programs of countries such as Japan, which is a major presence in educational development in Asian nations, and the world roles of the Netherlands and Sweden.

Connectivity: On the basis of indicators of ICT connectivity Australia performs at better than average OECD levels. Australia's national language English is the one global language of education and research. However, like the other English speaking nations (except Canada and Singapore) Australia is monolingual in government, public culture and business. The level of Asian language learning in education is low.

The formal structures of Australian tertiary education facilitate mobility in and out of the country. Tertiary program structure is generally compatible with the rest of the world though three year first degrees can face difficulties in establishing standing in the USA at the point of entry to Masters programs given the American norm of four years. Three-year degrees may also become a problem in China. The quality assurance framework is internationally credible and more so now that its surveillance of offshore activity is improving. Moves towards a possible diploma supplement along European lines are promising, as this standardized auxiliary credential is already playing a major role in Europe and will secure worldwide recognition. In terms of inward student movement, Australian higher education is marketed effectively; in comparative terms the urban living environments are attractive (which is not to say international students face no problems; safety is a growing concern); though students are restricted to 20 hours per week during semester. The cost and availability of housing is a growing difficulty in Sydney and Melbourne. Visa procedures are easier than in the most other English-speaking countries, though this varies according to nation of origin. From time to time the relative cost of visas, and the policing of breaches of the study conditions, have evoked concerns. In terms of the inward movement of academic staff and researchers, Australia is supportive of short-term visitors and facilitates entry into career positions. In terms of the outward movement of students, the flows are disappointing. Australia has the highest ratio of inward to outward student movement in the OECD (OECD, 2007c). The current mechanisms of OS-HELP, the extended HECS loan and a complex set of Endeavour programs are not effective in encouraging local outward movement. The pattern of short-term outward movement of staff and researchers is healthier.

It is more difficult to reach judgements concerning the openness and enthusiasm of Australian higher education personnel towards global engagement. But the fact that the international industry developed so quickly and so well reflects the enthusiasm of thousands of people in their offshore encounters, mostly in Asia. International and global relations are centrally placed in many institutions and this sharply contrasts with the situation in most higher education institutions in the English-speaking world, especially in the USA. The retarding factor is lack of language skills. Global demand

for Asian language skills will increase, especially as China's economy gains further traction, and the Australian weakness in this area will become a more urgent issue.

The education export industry: For Australian policy makers and institutions, taken as a whole, during the last two decades the most important single objective of international connectedness has been to maximize the surplus generated by the export industry (Marginson, 2007c). To an extent which would surprise higher education personnel in many other nations, the offshore travel of personnel and the pattern of institutional partnerships and alliances have been focused on building the export industry. Global research collaboration is important, especially in the research intensive universities. But it has been a secondary objective of the system overall.

In many respects Australian history is the story of a series of large scale export sectors, from gold, wool, wheat and beef in the nineteenth century to the contemporary mining and resource extraction sector. In their mature phase these industries are characterized by the standardized production of fixed products at high volume, expanding in response to demand, led by technically superior work organization and good quality marketing. So it is with the education services sector. Between 1985 and 2005 the world number of foreign students multiplied by three but in Australia multiplied by twelve. The rate of growth of international students since the mid 1990s has been very rapid and contrasts markedly with the trajectory of domestic students where growth has been modest. Between 1988 and 2006 the number of domestic students multiplied by 1.61 times, falling in some years; while international student numbers showed continuous and rapid growth, multiplying by 9.84 times. In 1990 there were 25,000 foreign students in Australia. By 2007 the number was 254,414 in the public universities and 18,685 in private sector institutions in higher education alone, plus international students in vocational education and training, English language colleges and schools. In higher education the proportion of enrolled students in Australia that are foreign students was 26.0 per cent of all students in the public institutions in 2007, the highest level in the developed countries (DEEWR, 2009). The OECD data for 2006, which include only onshore international students, show that the international students were 19.7 per cent of total OECD type A tertiary students in Australia compared to a then 15.2 per cent in the UK, 15.1 per cent in New Zealand, 15.1 per cent in UK, 13.4 per cent in Switzerland and 34.1 per cent in Austria. The OECD country average was 7.3 per cent; the US level of foreign enrolment was 3.1 per cent (OECD, 2008c, p. 366).

The number of international students enrolled in individual institutions in Australia is very large by world standards. In the USA in 2006, the University of Southern California in Los Angeles with 7115 international students had the largest number of foreign students. There were 14 Australian universities with more international students than this in 2007, led by 19,827 at RMIT University. All but three exceeded 7115 in on shore enrolments. Table 13 lists the top ten institutions in numbers.

Table 13. **International student enrolments and revenues at ten institutions with largest number of international students, Australia, 2007**

Institution	Enrolled international students			Income from international students	
		proportion of all students %	on-shore only	$s mill. AUD	proportion of all income %
RMIT U	19,827	45.8	7861	156.4	26.3
Monash U	17,813	31.9	11,427	208.3	18.2
Curtin U Technology	16,655	45.8	8466	121.7	21.5
U South Australia	11,536	33.5	4842	69.7	16.8
Macquarie U	11,208	34.8	10,062	117.4	27.7
U Melbourne	11,191	25.3	11,105	221.8	15.5
U Sydney	10,429	22.2	9865	171.9	13.2
Central Queensland U	9797	46.5	9227	109.4	43.8
U New South Wales	9399	21.9	9284	131.6	14.3
Griffith U	8847	24.3	8188	103.2	19.4

Source: DEEWR, 2009

The Reserve Bank notes that 'since 1982, education services exports have grown at an average annual rate of around 14 per cent in volume terms'. This compares with growth of about 6 per cent per annum in both total exports and total services exports over the same period. The estimated value of Australian education exports in 2007, incorporating both onshore international student fees and other expenditures by students on housing, food, transport, living costs and entertainment, totalled USD $8.4 billion. In all 39 per cent of total education export income derived from tuition fees. Nearly all the total education export income, 97 per cent, was from onshore students in Australia. Education was the third largest export sector at 5.6 per cent of exports, behind coal 9.5 per cent), iron ore (7.5 per cent) and ahead of tourism (5.4 per cent) and gold (5.2 per cent). In 2007 about 60 per cent of all education export revenue derived from higher education institutions, though they enrolled less than 40 per cent of all international students in Australia (Reserve Bank, 2008a). In 2008 the total revenues derived from education exports increased to $10.3 billion. This does not include any receipts from transnational offshore Australian campuses.

Note that in the UK the aggregate value of the export industry in 2003-2004, taking all student expenditures into account, and including private sector training, consultancy and education-related goods and services on and offshore (this is a more comprehensive figure for exports than the Australian data cited in this section of the paper) was 28.8 billion sterling. International students in the higher education sector alone, excluding transnational education, generated 5.6 billion sterling. Transnational higher education was worth 200 million sterling (Lenton, 2007).

The Australian education export industry earns more relative to national GDP than does education in any other OECD nation. Since 2000 there has been a significant slowdown in the pace of growth of all major export categories except coal, iron ore and education, which doubled its share of total export revenues in the period 2000-2007. Education exports now earn almost half as much as the whole manufacturing

sector, which constituted 13.9 per cent of export values in 2007 (Reserve Bank, 2008b). Since the commencement of the global recession commodity prices have fallen while revenues from education export appear to be continuing to increase. Education's share of total Australian export revenue will grow further, increasing the central importance of education exports for macro economic policy in Australia. In Australia's second largest state, Victoria, education services were the largest export in 2007-2008 and were worth $3 billion (Bradley, 2008, p. 87).

On the demand side of the market Australia has befitted from the expansion of the middle classes in China, India and Southeast Asia. Applications are considerably in excess of the number of student visas granted each year. However, while most of the discussion of the international student market in Australia has focused on the demand side the supply side has been the most dynamic element in growth. On the supply side the immediate drivers are the number of visas granted and the willingness of institutions to take students. Visa policy is shaped by two macro-economic objectives: the desire of the Australian government to grow export revenues, and its desire for skilled migrants. The international education program is also a principal source of skilled migration to Australia. About 40 per cent of all graduate international students apply for permanent residence. This has also been one of the key drivers of demand for international education, as in other English speaking nations. However the most dynamic element on the supply side has been the entrepreneurial drive of the institutions themselves. Prior to the new system of demand-driven enrolments announced in the 2009 federal budget and to be phased in by 2012 (section 2.2), domestic student numbers were largely set by government decisions on the annual number of subsidized HECS-based places. Though institutions have been free to expand fee-paying postgraduate programs to meet demand these are minor components of total domestic intake. In contrast the number of international students is open-ended and determined by the institutions themselves, with reference to levels of effective demand and their own capacity and willingness to enrol. While there is a ceiling on tuition charges paid by local Institutions have been free to set whatever tuition levels for international students that they choose and thereby to aim for whatever level of unit surplus they consider to be feasible and desirable. And the policy settings have ensured that the institutions have been powerfully driven to raise these revenues.

In 1988, as the international market was put in place, the average level of Commonwealth funding per domestic student place in higher education was reduced by 10-15 per cent, depending on institutional type (Burke, 1988). Public incomes were reduced just as fee-paying international education came on line to fill the gap. In 1995 a regime of partial indexation of government grants was introduced, opening up a continuing gap between institutional revenue and expenditure. The effects of partial indexation accumulate so that the size of the gap increased each year, meaning that each year there was a larger financial hole to fill from private income sources. On top of partial indexation, in 1996 the Vanstone budget put in place a succession of annual reductions in the real value of the grants (1997-2000), which exacerbated the reductions generated by partial indexation. Between 1995 and 2005, Australia was the only nation to reduce total public spending on tertiary education, and public funding per student fell by 28 per cent in real terms (OECD, 2007c). After a decade of

partial indexation, by the mid 2000s, in most fields of study, the total tuition income received for each domestic student place (i.e. the student HECS contribution plus the government subsidy) had fallen below the average unit cost of supplying those places, despite the fact that the cost of the student HECS contribution had been sharply increased. Universities were losing money from every local student they enrolled. In addition, in Australia government funded research projects were financed only to the extent of 60-70 per cent of full cost (Bradley, 2008; Cutler, 2008). By far the most effective way to increase private income and to do so quickly and on an increasing basis each year has been to increase the number of international students.

Thus the export market subsidises both domestic teaching capacity and domestic research activity and it has been essential to increase the level of subsidisation over time. Surplus from international education has also been fed into services, facilities and new buildings used by all students. For government the growing dependence on international students has been a fiscal virtue because it has allowed public funding of higher education to be held down. It has also been a political virtue because government can point to the growth of international students and revenues as an indicator of both apparently high system quality and a healthy financial position. This appearance of a healthy system (not withstanding the pressures on basic research and the declining student-staff ratios) has been reinforced by institutional marketing and on the whole has been protected by quality assurance systems which are mindful of the need to sustain Australia's position in the global student market. Thus the other side to the success of the industry is that Australia has a higher dependence on international education than any other nation. In 2007 revenues from foreign students provided 15.0 per cent of total public higher education revenues. The role of international student fees was much higher in some institutions in Table 13. At Central Queensland University international students constituted 46.5 per cent of the student body and provided almost half of all revenues, 43.8 per cent. At RMIT, Curtin and Macquarie universities international revenue exceeded 20 per cent of the total.

In sum, the growth of the industry is the outcome of the strength of the financial incentives on the supply side; and the presence of a large pool of unmet demand partly fuelled by migration incentives; in conjunction with successful business models at institutional level and the effective management, promotion and regulation of the industry by Australian Education International, the Commonwealth's international education arm. The industry owes much to the effective offshore relationships built up between Australian government officials, and institutions and their agents. It has also been carried by marketing and student servicing work at institutional level that has continuously improved over the last two decades and now performs at a high level of excellence in many institutions. Student surveys suggest that the use of services is higher in Australia than the UK, and the level of student satisfaction with services is higher in Australia than the UK (UKCOSA, 2004; AEI, 2007). Australian institutions seem to do particularly well at the 'meet-and-greet' and early settlement stage.

On the other hand, for the most part Australian success in international education has not been carried by academic innovations. In a fully commercial framework academic innovations are seen to subtract from revenues. Thus in some respects Australian academic cultures remain surprisingly unchanged by the expansion of the

international education program; key and obvious problems such as the poor standards of English preparation and support remain unaddressed, though addressing them would strengthen Australia's market position; and the pedagogical and curricular potentials of intercultural education are little explored. The industry is locked into service improvement rather than product improvement, where product means teaching and learning. Compared to academic activities, business methods provide a more limited set of product development options. It has been difficult to synergise the academic capacities of Australian universities with their business strengths. There is limited scope to bring research insights and cultures to bear on improving standardised high-volume course work programs provided to middle-level students. Australia is weak in international doctoral education (see below), where the potential nexus between research and teaching is maximised. Thus Australia has sought to differentiate itself from the USA and UK not through the educational and cultural contents of its programs, but on the basis of a cheaper price; proximity to Asia, safety, tolerance, and non-academic services; climate and other tourist benefits; and generic claims about excellence. As a position-taking strategy, this is vulnerable to shifts in prices relative to competitor countries and changes in perceptions about qualities such as safety and academic standards.

The framework of regulation also reflects a narrow construction of 'international education' (Marginson, et al., forthcoming). It covers certain aspects of the experience very well and others not at all, retarding the potential for improvement. The ESOS Act provides consumer protection in the market and establishes a partial duty of care through the obligation to offer services when the student is on campus. It offers nothing in the way of academic support specific to students from non-English speaking backgrounds and together with DIAC it tackles the problem of standards, and the desires of foreign students for English language skills, only through the blunt instrument of English-language tests administered at the point of entry and the point of application for migration status. It also offers little assistance to international students off campus where most of their difficulties tend to arise (Deumert, et al., 2005; Sawir, et al., 2008). The jurisdiction and responsibility of the educational providers, which are the instruments of policy under the ESOS Act, do not extend to the private rental market, to the student workplace and to racism in the community.

Other concerns relate to the relatively narrow profile of the industry. In following the pathway of maximum growth it has been shaped directly by market forces. Market forces are indifferent to questions of the balance between disciplines, levels of study and nations of origin. In all of the areas the student intake is highly skewed. First, the profile is narrow in relation to nations of origin. In all, 216,842 foreign students in 2007 were from Southeast, Northeast and South/Central Asia, 79.4 per cent of all international students. That is natural given Australia's geographic position, demography and the post second world war history of international education. However, within Asia there is primary dependence on Mainland China (58,079), Malaysia (29,538), Singapore (29,345), India (23,491) and Hong Kong (22,775). China including Hong Kong constituted 29.6 per cent of all students in 2007. One of the concerns here is that the number of students coming to Australia from Southeast Asia, the one zone in which Australia is the principal English speaking exporting nation and has clear-cut comparative advantage, has plateaued in the case of

Malaysia and declined in the case of Singapore, Indonesia and Thailand. Between 1997 and 2007, in all Australian education institutions, the combined share from Indonesia, Malaysia and Singapore fell from 32.6 per cent to 11.7 per cent. In the last five years nearly all growth in students has derived from India and China. Numbers from China have doubled in that time, and numbers of India rose by five times, albeit from a low base (Reserve Bank, 2008a). The recent history of international education in New Zealand points to the dangers of a narrow enrolment profile. In that nation international students in higher education fell from 126,919 in 2002 to 90,934 in 2007 (28.4 per cent) due to a sharp decline in numbers from China, though numbers from most other countries were increasing (New Zealand government, 2007, p. 6). The New Zealand export industry was highly dependent on the intake from China.

The profile of international education in Australia is also narrow as to field and level of study. The dominant role of business education is unsurprising as the business disciplines play a principal role in international education in many countries. More specific to Australia is the strong concentration on short coursework Masters programs and the weakness of international doctoral education relative to other levels of international student enrolment. In 2007 there were 76,654 international students at coursework Masters level, comprising 28.1 per cent of internationals in the Australian higher education institutions. This compares with an overall proportion of coursework Masters students (local and international) in the student body of 15.2 per cent. At the same time there were 8513 international doctoral students, 3.1 per cent of all international students. This figure is lower than the proportion of PhDs in the general student body (4.2 per cent) and indicates the minor role played by international research students within the Australian international education program when compared with the international education programs of other nations. OECD data indicate that in 2003 research students constituted a high proportion of cross-border enrolments in several European nations including Switzerland (18.4 per cent), Finland (17.8 per cent) and Sweden (12.7 per cent), and 9.4 per cent in the UK, compared to the 3.1 per cent in Australia (OECD, 2005b, p. 272). In the UK in 2004 there were 34,533 international doctoral students, compared to 6594 that year in Australia, although the size of UK higher education is only about three times that of Australia (OECD, 2007b). As noted international students comprise about half of the UK's 119,000 postgraduate research students and are an important source of high skilled migrants. The UK has 15 per cent of the world doctoral market. In the US the cross-border doctoral student cohort is double that of the UK in size and constitutes one third of all doctoral students (International Focus, 2008, p. 4; IIE, 2007).

Here the issue in Australia is not so much that the number of international doctoral students is low in absolute terms – 8513 PhD students is a sizeable number, and constitutes 20.7 per cent of all doctoral students in Australia – but that research degrees are a relatively low priority in a program focused on the generation of revenues that are sourced for purposes other than international education. Thus Australia provides comparatively few scholarships with attached living allowances. Those without full scholarships enrol in places offering limited support, for example fees but not living allowances, or no support for dependents. This means there are questions to be asked not just about the size of the Australian doctoral intake from abroad, but its relative quality. Australia is essentially uncompetitive in the global

competition for the highest quality international PhDs, and this weakness decisively reduces the medium and long term potential of the national innovation system. The United States provides over 60,000 foreign doctoral scholarships a year and approximately half of all its foreign doctoral graduates can be expected to stay on in the United States, swelling the American knowledge economy. Some Australian institutions allocate part of the revenues from their fee-based places to the provision of international student scholarships, but in the present system settings these strategies are inevitably marginal, and cannot turn the situation around. Institutions cannot afford to allocate more than a small part of their income this way.

In sum, although the Australian export industry has been brilliantly successful in economic terms, its outstanding growth has been exhibited along relatively narrow lines and has yet to be consolidated in a distinctive comparative advantage based on product. Australia has specialized in high-volume, medium-quality, standard-cost degrees in generic Anglo-American applied vocational programs. The United Kingdom has also adopted a commercial approach to foreign education, but seems to be less stymied by trade-offs between research capacity and commercial development and between quantity- and quality-driven globalization. International doctoral students are a much higher system priority in the US and UK. The Australia industry model has been conducive to growth but is not necessary conducive to long term consolidation. Given the level of dependency on this source of revenue, the rapid growth of international education export is as much a weakness, as a strength. This has become a concern to policy makers. Because international education contributes to the core funding of domestic activities, a weakening of Australia's export market position could have serious consequences for both domestic teaching and research capacity. Such a weakening could result from a downturn in the quantity and/or quality of student demand. It could also result from decisions on the supply side, For example reduction in the level of skilled migration could feed into a reduction in student visa numbers and could also feed into reduced demand. Thus a central continuing issue for the industry is migration policy. In 2009 the intake of skilled migrants was reduced; the effects on visa numbers are not yet apparent.

Narrow export focus versus broad-based internationalisation: The growth dynamic of the Australian higher education export sector powered not by the attractions of a high quality system (e.g. Canada's system has equal or greater quality but does not have the same export growth rate) but on the deliberate under-funding of the Australian system. Public under-funding has driven export growth from the supply side, as all Australian institutions know and as official sources now acknowledge (Bradley, 2008). But under-funding tends to empty out domestic quality at the same time and is particularly detrimental to the long term accumulation of capacity in basic research. It also tends to narrow international connectivity to those areas and activities that contribute to export revenues. In sum, the policy settings have factored in a tension between the drivers of growth in exports, and the evolution of Australia's global capacity as a knowledge economy, particularly in relation to research.

This tension is manifest in three ways. First, given that the strengthening of domestic participation and the accumulation of critical mass in basic research are both integral to national capacity in the knowledge economy, the public funding reductions that

have driven export growth have directly weakened the long term potential of the Australian knowledge economy. Second, the forced growth of exports according to a commercial logic, unalloyed by other incentives, not only skews the balance of enrolments by nations of origin, field of study and course level; it installs a quantity not quality dynamic (not a quantity *and* quality dynamic) at the heart of the international education industry. Fee paying coursework Masters students are highly valued but the best international doctoral students, who need scholarships and not full fee places, are less valued despite their strategic significance for global strategy. Third, the system settings tend to restrict the potential of Australian institutions to engage successfully in a range of cross-border activities. While higher education institutions maintain a broader set of activities, inevitably the balance is skewed towards the export sector and the potentials of other areas remain under-developed.

Towards a broader global engagement: Within Australian higher education there is significant support for a broader global engagement that that determined by the funding settings and the resulting narrow focus on export volume. For example in 2008 a paper by Flinders University Pro Vice-Chancellor (International) Dean Forbes argued that Australian higher education should move to a 'third wave of internationalization'. The first wave was the period of education aid to Asia and the Pacific shaped by the multilateral Colombo Plan. The second wave was the creation of the full fee market in Australia. 'The third wave involves universities embracing more diverse kinds of international strategies that support … a stronger and more integral role in the evolving knowledge economy'. Forbes saw international education as continuing to grow in numbers, but a more nuanced educational program, with a greater diversity of disciplines, a higher proportion of research students, and more attention to English language capabilities and preparation for Australian pedagogies (Forbes, 2008, p. 1). He also saw the international program as the medium for a broader set of cross-border engagements, including more emphasis on building research and scholarly collaborations and on attracting talented research students. 'The competition to attract the best students, and to build the links with the new emerging centres of the knowledge economy is white hot'. Australian students should have more and better opportunities to go abroad on study programs, to acquire the skills needed in the k-economy. More effort should be made to reach out to alumni in the Asia-Pacific region and in cooperation with them, to contribute to higher education capacity building in the region, a global public good function (Forbes, 2008, p. 2). In addition to Forbes' list, within the constrained political economy of international education it has proved difficult to systematically tackle problems of standards in international education, and explore the potentials of intercultural education in classrooms in which half or more of the students may be international.

2008 Bradley review: The 2008 review of Australian higher education led by Denise Bradley drew attention to the 'possible over-dependence of some providers on international students' which leaves them vulnerable to sudden changes in demand such as those flowing from 'political or economic upheaval' in the countries that supply students to Australia (Bradley, 2008, p. 91), and the relatively narrow profile of international education in Australia. The Bradley report noted that 'Australia has been a world leader in international education. It has also been extremely successful in developing education as an important export industry and Australia's universities

have been central to the development of this industry. But the Australian higher education sector will need to build on this success and broaden the focus of its international education activities if it is to remain globally competitive'. The Bradley panel argued that 'There is a need to move to what is being called a "third phase" of internationalization characterised by a more holistic approach' which would maintain a substantial export sector, but add to it 'a more diverse international student body and a greater proportion of higher degree research students'; better student support, and enhance 'international research collaborations' (p. 87).

> … a critical issue for the higher education sector is the renewal of the academic workforce. International students are a potential source of the high-level skills required for academic roles. Australia is not currently well placed to attract international students for the renewal of the academic workforce…If Australia is to attract greater numbers of international students into research programs, and find ways in which to retain graduates to stay and work in Australia, research programs need to become more attractive to these high-performing students. High-quality research students will go where the money is in terms of support – scholarships and living allowances – and where there are high-quality research facilities and researchers… One significant area of concern that affects the inward movement of higher degree research students is the level of support provided by Australian governments. Compared to the United States and the United Kingdom, there are relatively few scholarships which attract these students and conditions to their visas hinder their spouses and dependants from working and studying in Australia. Australia does not provide many scholarships with living allowances or support for dependants. This makes it uncompetitive in the global market for higher degree research students. The panel believes that this will have a long-term effect on the national innovation system… There have been no specific policies implemented to attract and retain higher degree research students in Australia (Bradley, 2008, p. 99-101).

The Bradley report proposed 'that the Australian Government provide up to 1000 tuition subsidy scholarships per year for international students in higher degree by research programs targeted to areas of skills shortage'. It suggested that institutions should fund the living allowances to accompany the tuition scholarships (p. 101). The Report also proposed that within international education there should be emphasis on work experience and training in English language work requirements (p. 103)

2009 Budget decisions: The 2009 budget announced that near full cost indexation of government subsidies for domestic students would be phased in over four years, and full research funding would be phased in over six years. This held out the prospect of a medium change in the financial settings which governed the export-focus of international education. With the cost gap no longer increasing each year institutions would no longer need to keep growing international enrolments. However, with domestic student funding still at less than average unit cost levels they would still need to maintain large scale international programs. In the interim, for up to another half decade until full indexation was phased in, export volume will still need to be increased to cover a gap between institutional incomes and costs. On present indications institutions will be largely dependent on China and India for the continuing

growth of student numbers. The Bradley report's recommendation for 1000 tuition subsidy scholarships per year for international students was not taken up.

5.3 Personal Note

Given the Singapore strategy the question posed for Hong Kong is whether and to what extent the SAR should adopt a hub strategy, and if so what might be the contents of such a strategy. The Singapore experience also suggests that the notion of global education hub as defined in Singapore has limitations. It is unlikely that Singapore by itself could readily secure a competitive advantage as a global player. This is because geography, history and situation matter in higher education, it is not a product independent of place and other contextual factors. How could Singapore's education and research services consistently outperform the rest of the world; how could it offer New York or Paris something special unavailable to them in the Atlantic zone or elsewhere? Singapore acting by itself could not do this, however dextrous it was in reinventing itself and creating new forms of delivery and attracting talent. On the other hand a Singapore which offered access not just to Singapore itself but to East Asia would have more to offer. This suggests that the question of national hub strategy might be interdependent with the question of Asian regionalization. A single nation cannot sustain long-term global leadership in education and research unless it is the USA or in the longer term, China. However, China is not yet able to exercise American style leadership in the knowledge economy. On the other hand a region might already be able to exercise such leadership. Nevertheless, to pursue a regional strategy is to ground the nation-state in a larger identity, as the nations of continental Europe have in fact already done in the field of higher education.

Following this line of reasoning, for Hong Kong SAR the useful questions are not solely 'what is in Hong Kong's interest?' or 'what is in China's interest?' but 'what is in the interest of the East and Southeast Asian (or Asia-Pacific) region' and 'how can an Asia-Pacific region in higher education be built?' It was argued above that the key conditions for regionalization are geographical proximity, scale, cultural coherence, and the political will, and that the last was the most difficult condition to fulfil. The key to political will is leadership. Leadership of a regional project is a delicate matter and not all nations can play such a role. The historical legacy, which has proven very difficult to overcome, inhibits the regional potentials of Japan in higher education. Indonesia's higher education and research systems are too under-developed for that nation to play the leadership role. Neither in the Philippines nor Vietnam is higher education in a sufficiently developed condition to play the role of regional forum and broker. Malaysia, Thailand and Korea might be about the right size. Korea has the appropriate level of development in research and higher education. But this is less true in Malaysia and Thailand and in both these nations there are significant internal problems. Singapore has the capacity to lead regionalization but it is located at the edge of East Asia and not the centre, and more interested in global than regional strategy. And by itself it is too small to lead an East and SE Asian higher education region. Perhaps China is too large to lead the process of regionalisation without dominating it; and in any case China has its own global project. But Hong Kong might provide a different strategic option. Aside from Korea, perhaps Hong Kong, with its central position and its autonomous relationship inside China, might be best placed to

broker regionalization in Asia-Pacific higher education and research. Hong Kong as a strong regional coordination point would become a de facto global hub.

6. Growth, participation and equity

- *Will the number of university places continue to increase? What has been and will be the impact on society of massification of higher education and the growth in the number at university? Do you have a view on what "should be" the percentage of population to receive higher education in an advanced economy? Please explain why.*

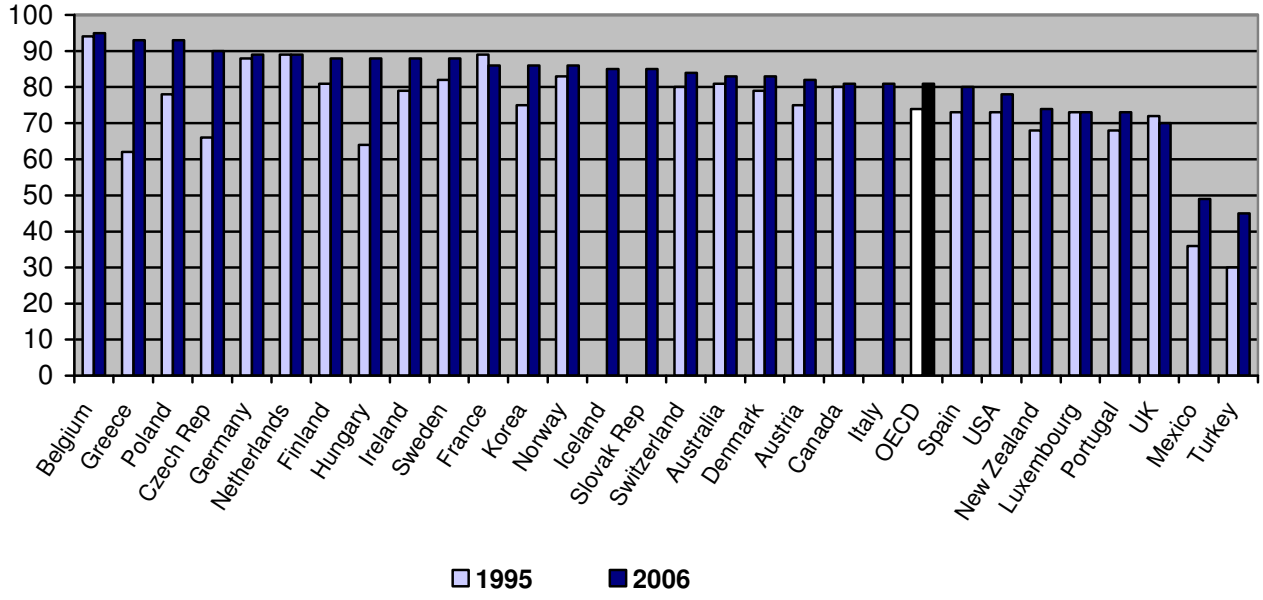
- *What are the trends in public expectations with regard to access to and outcomes of higher education?*

6.1 Global overview

Secular trend to increased tertiary participation: The OECD remarks that in the last fifty years 'the expansion of tertiary education has been remarkable'. 'Many OECD countries have witnessed a remarkable expansion of education'. Increasing attainment is 'one of the most salient trends in education… As secondary education has become nearly universalised, the marked expansion of participation in education is better shown by the proportions now reaching higher education'. Between 1991 and 2004 the average annual growth of tertiary enrolment in East Asia and the Pacific was 8.1 per cent which was more rapid than in any other world region, albeit from a low base (OECD, 2008b, p. 41 and p. 48). The secular trend to the extension of educational participation across the population and up the age structure is an inexorable fact of modern life, one of the clearest and strongest of all social trends. The growth of demand for tertiary places is shaped by the spreading role of professional and other knowledge-intensive labour in the global knowledge economy (higher skill requirements); by credentialism (higher credentials for the same skills); and by desires for upward mobility and the political pressure on governments to provide opportunities. On the supply side, the trend to rising participation is being fed by the funded expansion of places to meet knowledge economy objectives, and by the ongoing desire of political parties and governments to secure democratic political support. Nations and regions where participation is growing rapidly can secure a strategic advantage through the rapidly improving productivity of younger workers; while nations that develop effective systems of adult and lifelong learning will install a more universal reflexive capacity for productivity improvement than systems in which the role of higher education is confined largely to initial preparation. Despite the latter point, in many nations student support and tuition charges still discriminate in favour of young people. Adult participation rates vary very significantly; though again there is a common global trend to growing participation (OECD, 2008a, Vol. 1, p. 47; 2008c).

Comparative national rates of participation in tertiary education: The rate of participation of the population in upper secondary and tertiary education varies markedly by nation. In 2006 the highest nation in the OECD was Belgium at 95 per cent; the lowest is Turkey at 45 per cent (Figure 6). There is an even more marked variation between rates of participation at ages 20-29 years. The highest participation rates in that age group in 2006 were Finland 43 per cent, Iceland 37 per cent, Sweden 36 per cent, Australia 33 per cent and Greece 32 per cent.

Figure 6. **Rates of participation in education (full-time and part-time), 15-19 year olds OECD nations, 1995 and 2006**



In the UK a series break in the data means that the comparison of 1995-2006 is not accurate.
Source: OECD, 2008c, p. 344.

Notwithstanding the fact that there is a universal secular trend to the growth in participation, as Figure 6 shows it is not constant on an annual basis or uniform across nations. Nations vary in the extent to which participation rates have changed since 1995, though in almost all nations in Figure 6 the participation rate has improved. Note that along with the UK the United States is in the bottom third for participation in the 15-19 year age group. There continues to be high drop out rate, a problem that has so far proven intractable to policy. The participation rate of US people aged 20 and above is also comparatively weak. In this area both the East Asian and European national systems, with their more focused approach to policy and incentives in relation to building participation rates, might secure a social and economic advantage. In the last two decades there has been a particularly dramatic growth in China in participation rates albeit from a low base. Between 1990 and 2006 the gross enrolment rate in relation to tertiary education rose from 3 to 22 per cent of the age group (Rong, 2009). This constitutes a mind-boggling shift in the role of tertiary education. Between 1998 and 2005, the number of enrolled tertiary students in China multiplied by 4.5 times and the number of tertiary graduates multiplied by 3.7 times (Li, et al., 2008, p. 5). Not only are such rates of growth unprecedented, China's educational growth is taking place in the country with the world's largest population. It is a seismic shift in the role of tertiary education on a planetary scale. As noted China has also expanded research at similar rates (above) and lifted institutional quality.

Equity in participation and completion: While the need for government to facilitate rising tertiary participation over time is as close as we can come to a universal law of

policy, equity poses a more ambiguous and intractable set of policy problems. The social base of tertiary expands but there is continuing uncertainty about what this means for the balance of educational opportunities between different social groups (OECD, 2008d, p. 13). In many nations there is a lack of strong data for longitudinal analysis of trends (p. 21). The OECD states that equity has two dimensions: inclusion and fairness. The former refers to the trend to universalisation of educational attainment expressed in rising participation rates with an emphasis on eliminating all cases of exclusion. The latter implies 'ensuring that personal and social circumstances – for example gender, socioeconomic status or ethnic origin – should not be an obstacle to achieving educational potential' (OECD, 2008a, Volume 2, p. 13). The OECD (2008a, Volume 2, Chapter 6) provides a useful review of perspectives and strategies in relation to equity. It argues that improving educational resources and structuring opportunities more inclusively at pre-tertiary stage is likely to be more effective in tackling inequities in tertiary participation. 'In Sweden as in France, the reform of lower secondary education appears to have been a crucial factor in lessening inequality' (Vincent-Lancrin, 2008, p. 71). However while tertiary education cannot by itself create equity its systems and cultures readily enhance inequality and this is to be guarded against (OECD, 2008a, Volume 2, pp. 17-18); and much can be achieved by more effective liaison between tertiary institutions and schools, a policy and practice theme that has become common to many OECD systems (OECD, 2008a, Vol. 1, pp. 101-105). Different aspirations, tertiary student financing, modes of selection, and the relationship and throughput between universities and other institutions (p. 49): all have implications for equity. Institutional or classroom-based streaming tends to work against equity, both because all students gain educationally from the presence of bright students in the classroom (p. 39), and because over time prestructured opportunities tend to follow social logics, if they were not grounded in social inequality at the point of establishment.

> There is evidence that highly segmented or 'tracked' systems of secondary education – *i.e.* those that separate students into distinct tracks of preparation at an early age, as distinct from those that are comprehensive - have the effect of widening inequalities in entry to tertiary education.25 Systems with high levels of segmentation show a stronger relationship between family background and student achievement (with consequences for tertiary enrolment) than those that do not. This is because systems of education that sort and segment students allow inequalities in family circumstances to combine with peer and instructional inequalities to produce wider variation in secondary achievement, and more unequal opportunities for entry into tertiary education (OECD, 2008a, Volume 2, p. 37).

On the question of the effects of expansion in aggregate participation on the balance of inclusion between social groups, the evidence is mixed. A frequent finding is that the balance between social groups remains fairly constant as participation rates increase, with some fluctuations. On balance the most recent evidence favours those national systems in which growth in participation rates has sometimes or more been accompanied by improved equity, but there is no casual relationship between expansion and equity of the mix (Vincent-Lancrin, 2008, p.73 & 79). Some researchers also argue that whereas change in relative group shares reflects a

preoccupation with education as a positional good, and improvement in the absolute level of opportunity (e.g. growth in the proportion of the under-represented group that attends tertiary education) constitutes an advance in equity regardless of what is happening in other groups (OECD, 2008a, Volume 2, pp. 18-19). 'As education is not simply a "positional good" whose value depends solely on the education of others but includes intrinsic personal benefits that are not exclusively economic, this far greater openness is a sign of real social progress. It is probable that this will continue with the expansion of higher education in the decades ahead'. Further, the expansion of participation among all social strata leads to a more diverse mix on social groups inside institutions, even if the proportions have not much altered, and this broadens the social and cultural experience; though the degree of mixing varies by institution (Vincent-Lancrin, 2008, p. 72). In some systems massification is associated with greater selectivity in social access to the leading institutions. Research shows that as participation expands at a constant level of education it often becomes more stratified between groups on the basis of the distinction between higher and lower status institutions, and/or higher and lower status programs (OECD, 2008a, Volume 2, p. 26). In relation to gender, rising participation rates have been accompanied by a near universal shift in the balance of enrolments towards women, with women now in the majority in most university systems except in some technologies and at PhD stage.

6.2 Australia

Comparative educational qualification and participation rates: According to the 2008 edition of the OECD's *Education at a Glance*, in Australia 33 per cent of the 25-64 year old population has tertiary qualifications compared to an OECD average of 27 per cent. This reflects Australia's comparatively high level of participation in tertiary education in the last three decades. Australia's position falls below that of Canada (47 per cent) which is particularly high in terms of female qualifications, Japan (41 Per cent) and the USA and New Zealand (both 38 per cent). Australia is ahead of the UK (30 per cent), France (26 per cent) and Germany (23 per cent). At the same time the proportion of 25-64 year olds whose highest qualification is primary or lower secondary education is also relatively high in Australia, 33 per cent compared to an OECD average of 31 per cent, and 13-15 per cent in the USA, Canada and the UK (OECD, 2008c, 42). This may indicate the effects of migration policy prior to the present emphasis on skilled labour, but also illustrates the characteristic bifurcation in Australia between a relatively well educated layer and a relatively large early school leaver group. This bifurcation shows up also in the pattern of school achievement in the OECD PISA study, where Australia is relatively strong in the top quintile and relatively weak in the bottom quintile; and in the leakage of nearly one in five of the 15-129 year old age group from the education system. Figure 2 showed that the participation rate of 15-19 year olds in Australia is just above the OECD average, and that there has been little improvement in the participation rate since the mid 1990s. Australia has missed out on what has been the majority trend to significantly increasing participation; and its previous position of being well above the OECD average has deteriorated. Of the 26 OECD nations for which trend data are available, between 1995 and 2005 the participation rate of 15-19 year olds improved by 5 per cent or more in 15 of them. However, recent policy decisions by the Australian government are designed to lift participation rates significantly (see section 6).

Among 20-29 year olds, 33 per cent of Australians participate in education and training, compared to an OECD average of 25 per cent. Australia is 5th in the OECD on this indicator. The Scandinavian countries led by Finland (43 per cent) have higher rates of participation in this age bracket; the USA is at 23 per cent. Among 30-39 year olds the Australian rate of participation at 13.8 per cent is very strong, equal to that of Finland at the top of the OECD table. The OECD average is 5.7 per cent (OECD, 2008c, p. 343). Relatively high adult participation does not address the problem of early school leaving unless 'second chance' access plays a role. The OECD data do not allow us to distinguish the use of adult education by those who have already obtained tertiary education, from 'second chance' entrants, on a comparative basis.

Policy commitment to the principle of equity: In the last half century in Australia the social pressure for expanded aggregate access to tertiary education has ebbed and flowed (Marginson, 1997) – after a lull characterised by low growth and low unmet demand for entry in the decade after 1995 the volume of applications now seems to be rising - but expectations about social equity have been a constant. There is broad consensus across all institutions and in government that the participation of under-represented social groups should be expanded (Group of Eight, 2008) The principle of 'individual social justice' is strong in the Australian polity, meaning the notion that 'access to higher education and success in higher education should not be determined by class, ethnicity, geographical location or other personal characteristics. This principle has underpinned' the higher education sector's present equity policy framework 'since its inception in the early 1990s' (CSHE, 2008, p. 1). A difficulty for Australian policy is that it has failed to develop fine-grained methods of measuring the participation of socio-economic status groups, relaying on broad region of residence as a measure of social advantage/disadvantage. But it can safely be said that:

> … people from low SES [socio-economic status] backgrounds are significantly under-represented in Australian higher education. This conclusion is confirmed by many studies. In broad-brush terms using the available data, people from low SES backgrounds are about one-third as likely as people from high SES backgrounds to participate in higher education. The share of university places for people from low SES backgrounds — approximately 15 per cent of places, compared with a population reference point of 25 per cent — has remained virtually unchanged for 15 years despite the overall expansion of access to higher education during that period. People from low SES backgrounds are particularly underrepresented in the professional fields of study for which there is the most competitive entry and in postgraduate education. Students from low SES backgrounds comprise less than 10 per cent of postgraduate students.
>
> A set of interrelated factors lie behind the persistent under-representation in higher education of people from low SES backgrounds. The relative influence of these factors cannot be determined with precision from the available data. Under-representation in higher education is partially the result of lower levels of educational achievement in schools, lower educational aspirations and lower school completion rates. These three factors are significantly interrelated. It is likely that lower levels of educational achievement are the precursor for other

> effects. Imbalances in higher education participation reflect endemic educational disadvantage that begins in the earliest years of schooling. People from low SES backgrounds are more likely to have lower perceptions of the attainability of a university place, less confidence in the personal and career relevance of higher education and may be more likely to experience alienation from the cultures of universities (CSHE, 2008, pp. 2-3).

A shortage of financial resources can affect participation in two ways: by debarring students from entry into higher education and by forcing them to work during the period of study, attenuating their engagement as students. In Australia the latter may be a larger problem than the former. It is no longer widely held that financial factors play a major part in determining inequities in access to higher education as the financial burden of higher education is modest. Australian higher education students (though not vocational education and training students) mostly contribute to the cost of tuition in the form of deferred charges that take the form of a low interest student loan repayable through the tax system on an income contingent basis, i.e. when beneficiaries earn less than the threshold income they are not required to repay the loan. However institutional stratification enhances inequalities with students from the most advantaged SES categories tending to cluster in the leading universities (Bradley, 2008, p. 33). For the most part the success rate of low SES students, once admitted, is equal to that of other groups but this is not the case for low SES students from remote areas and Australian indigenous student, groups that overlap to some extent. The factors shaping indigenous access and success are distinct:

> The challenges lie in recruiting Indigenous students who are academically prepared for university (given that school completion rates for Indigenous people are about half of those for other Australians) and in retaining students once enrolled. The university completion rate for Indigenous enrollees remains well below 50 per cent. The low retention rate of Indigenous people is a major problem. The recent national study of student finances by Universities Australia has shown that financial factors are likely to be highly significant in improving access and retention for Indigenous students (CSHE, 2008, p. 4).

The 2008 Bradley report: In its review of Australian higher education in 2008 the main findings of the panel headed by Denise Bradley concerned the need to expand the national rate of participation in tertiary education and the need to improve the relative rate of participation of students from the bottom SES quartile. The report noted that Australia's rate of retention to the end of secondary school was slightly below the OECD average; and between 1996 and 2006 there had been growth in the number of countries ahead of Australia in the proportion of 25-34 year olds holding university degrees. 'Analysis of recent participation patterns and international comparisons shows that Australia is no longer at the forefront in this area of higher education performance' (Bradley, 2008, p. 39). The panel argued that targets for educational achievement should focus not on access rates but on successful completion rates. It resolved that 'the Australian Government set a national target of at least 40 per cent of 25- to 34-year-olds having attained a qualification at bachelor level or above by 2020' (p. 21). To facilitate the growth of enrolments the report proposed the deregulation of the volume of funded places for local students in a

'demand-driven entitlement' system (section 2.2). Urging universities to work more closely with secondary schools and other tertiary institutions to improve the access of under-represented groups, it proposed that 'the Australian Government set a national target that, by 2020, 20 per cent of higher education enrolments at undergraduate level are people from low socio-economic status backgrounds' (p. 45). 'Low socio-economic status was defined as the bottom quartile of the population. The report proposed that a new indicator of SES should be devised to replace postcode district of residence. The committee also recommended improved financial support for tertiary students.

2009 Australian government decisions: In March 2009 the federal government adopted the Bradley report's recommendation to adopt as a national target that by the year 2020, 20 per cent of first degree students should be from the bottom SES quartile. It also adopted the target of 40 per cent of Australians 25-34 year olds holding degrees but postponed that target date to 2025, suggesting that equity was a higher priority than growth. The May 2009 federal budget confirmed the adoption of the 'demand-driven entitlement system' from 2012, and allocated USD $291.3 over four years for measures designed to increase the participation of students from low SES backgrounds; and $327.1 million for growth in the number of funded places. Most of the Bradley report proposals on financial aid for students were also adopted. The government also foreshadowed a new system of 'compacts' (section 7.2) between government and institutions that would provide a framework in which it could negotiate individual institutional responses to the system target for equity.

It was announced that the new monies for equity, described as 'performance funding', would take two forms. The first component of funding would be awarded for 'partnership activities' between the higher education institution and schools and other tertiary providers, to encourage student aspirations for higher education and provide broader pathways and support into the universities. The second component of funding was to take the form of an enrolment loading based on the representation of low SES students in the university. The intention here was not only to reward the institutions for progress towards the equity goal but also to provide the low SES students with additional support in order to facilitate the completion of their degrees. The second, enrolment loading component of funding was three times the size of the first component, the monies for partnership activities. The new policy was as follows:

> To address Australia's historically poor record in increasing participation by low SES students, the Government has announced its ambition that by 2020, 20 per cent of higher education enrolments at the undergraduate level will be of people from a low SES background. This goal will be directly supported by the injection of an additional $394 million in funding, bringing funding to support the low SES participation targets to a total of $437 million over the next four years [both amounts in AUD]. At the same time the Government is also introducing major reforms to student income support to assist the access and retention of low SES students. In 2010, the funding provided will be about 2 per cent of teaching and learning grants, and will increase to about 3 per cent in 2011. By 2012, equity funding will be broadly in line with the recommendation of the Bradley Review to increase it to 4 per cent of teaching and learning grants.

The major barriers to increased higher education participation by students from low socio-economic backgrounds include previous educational attainment, low awareness of the long-term benefits of higher education resulting in little aspiration to participate, and the need for financial assistance, academic and personal support once enrolled. International experience shows that interventions or outreach in the early years of secondary schooling are highly effective in increasing the aspirations of students to attend university. The Government has therefore allocated $108 million [AUD] over four years for a new partnerships program, to link universities with low SES schools and vocational education and training providers. The intention is to create leading practice and competitive pressures to increase the aspirations of low SES students to higher education. The Government is deliberately putting in place systemic reasons for universities to be engaged with improving the quality of school education. Funding will provide schools and vocational education and training providers with links to universities, exposing their students to people, places and opportunities beyond the scope of their own experiences, helping teachers raise the aspirations of their students. Programs might include scholarships, mentoring of teachers and students, curriculum and teaching support, or hands-on activities run by university staff in schools.

Once students from disadvantaged backgrounds have entered university the likelihood of them completing their course of study is broadly similar to that of the general higher education population. Often, however, they require higher levels of support to succeed, including financial assistance and greater academic support, mentoring and counselling services. The Government has therefore allocated a further $325 million [AUD] over four years to be provided to universities as a financial incentive to expand their enrolment of low SES students, and to fund the intensive support needed to improve their completion and retention rates. The existing higher education Equity Support Program will be replaced and incorporated into these new funding arrangements.

Better measures of low socio economic status will be developed which are based on the circumstances of individual students and their families and performance funding will be based in part on how effective institutions are in attracting these students.

The steps to improve low SES student participation will impact on and benefit Indigenous students. They are significantly under represented in our universities and face distinct challenges. The Government will support a review of the effectiveness of measures to improve the participation of Indigenous students in higher education in consultation with the Indigenous Higher Education Advisory Council. Funding to increase low SES student participation is a key initiative to achieve the broader attainment target of 40 percent of 25 to 34 year olds having attained a bachelor level or above qualification by 2025 (Australian government, 2009, pp. 13-14).

6.3 Personal note

The Australian government has set the higher education institutions and itself a very difficult target in relation to social equity. First, it appears likely that less than 20 per cent of the current final year cohort at secondary school is from the bottom SES quartile, however SES is measured. Achievement of the target requires substantial change at school level to achieve higher levels of student retention and academic success. Second, using the (present flawed) postcode based measures, less than 10 per cent of the students in some universities are from the bottom SES quartile. In public statements in March 2009 by the federal Minister for Education it was hinted that not all institutions would be required to reach the target of 20 per cent of their students from the bottom SES quartile but all would be expected to make progress towards it. And to the extent that the most socially elite institutions fall short of the target others will have to exceed it. Third, though the government has announced there will no longer be restrictions on the maximum number of funded local students that institutions could enroll, with the new system fully operational by 2012, the fact that it has placed improved equity (target to be achieved by 2020) in sequence ahead of growth (target to be achieved by 2025) poses the difficult policy question of how to achieve a marked shift in the social distribution of places, a goals that had eluded policy in the past, ahead of rather than during a major expansion in numbers in which a shift in SES shares might be somewhat easier to achieve.

7. Government roles and agendas

- *Does the government have a firm view of what it wants the higher education sector to achieve? Do you see the scope for significant potential changes in the objectives of government policy on higher education?*

- *Do you see the government's policy in higher education moving towards further regulation or deregulation? What will the government's regulatory role be, and how will the government's regulation impact on the universities? How do you think the relationship between government and universities might be modified, if the proportion of university income drawn directly from taxpayer revenues is reduced?*

7.1 Global overview

State policy frameworks, marketisation, government-institution relations and the New Public Management: The last two decades have seen a major transformation in modes of governance, institutional organisation and management in higher education. Governance and organisation in higher education has been swept up in the larger transformation often called the 'new public management' (Marginson and Considine, 2000). Here quasi-democratic trends to openness, transparency, stakeholder participation and devolution – sometimes described as 'agentification', 'the creation of semi-autonomous agencies responsible for operational management' (de Boer, et al., 2009, p. 64) - have become combined with the modelling of

institutions as businesses, the professionalisation of management, part privatisation of some functions, competition and other quasi-market features; and also with the creation of more effective control and objective-driven and targeted systems moderated by lighter touch political devices such as formula funding which is 'now well established in most countries' (OECD, 2008a, p. 201). De Boer and colleagues (2009) refer to 'market governance' in higher education. These changes do not mean a less powerful nation-state in relation to higher education; nor do they in themselves solve recurring the policy dilemmas of efficiency/equity, transparency/ surveillance cost, access/quality, quality/relevance, quality/local engagement, accountability/ flexibility, competition/cooperation and quality/diversification (OECD, 2008a, Vol. 1, pp. 135-137); not to mention local/national/global; but have changed the functions and modus operandi of government, and may have diminished the political pressures on it, the breadth of the policy burdens it carries and the human aspirations it must meet, while increasing the expectations of regulatory systems.

A core feature of new public management-oriented systems are the tensions between freedom and control, and the inevitable oscillation between regulation and deregulation, which were always inherent in the Thatcher reform project of 'free market and strong state' which originated the new public management (Marginson, 1997). Within this policy framework government may move in either direction to realise its objectives. What distinguishes the different national systems of higher education from each other is not whether they experience this oscillation (all do); and not so much how the coupling of devolution and direction is played out in each case (it can vary over time without any necessary outcome in terms of competitive position or organisational cultures), but the core policy and strategic objectives determined by national identity and global strategy and the degree of system-wide consensus and coherence around those objectives. All nation-states are become 'global competition states' (Mok, 2009) in this era. But while some national systems have an explicit common project (e.g. Singapore); and some share a sense of destiny and view of human action which amounts to an implicit common project (e.g. higher education in the USA); for others national identity is primarily inward looking, or fractured and problematic, and does not cohere around the global positioning of the system.

Global variation in the role of government: Despite the universal influence of the new public management there remains much variation between national higher education systems in the scope of national policy, the role of law, the extent and nature of regulation/deregulation and the role of economic markets in funding and governance, the systems of funding and reporting, the agents and instruments of policy making and implementation, and the forms of and scope for institutional autonomy. These elements intersect with other forms of variation, such as whether the system is a unitary or federal one and if the latter what is the division of labour between the tiers of government; the extent and type of institutional diversity and differentiation; the degree and type of international engagement of institutions; and so on. In a paper of this length it is not possible to provide a comprehensive worldwide picture. Hence this section of the paper will made a few brief global observations before focusing in more detail on the Australian case. However, without developing a full typology here, we can observe three broad types of system:

1. *Bureaucratic system model:* Higher education systems administered by the state in the manner of a public service department, with some institutional autonomy in academic matters (e.g. in research). State appointment of key personnel and comprehensive government specification of mission, budgets and activities. Institutions are unlikely to have much financial autonomy and the poay and career structures of academic staff are regulated the same as or parallel to the state public service. Most Western European and East Asian systems have their origins in this model and some still partly lie within it;
2. *Decentralized corporate model:* Higher education systems in which there is no central government administration and there is a presumption that at least the research-intensive institutions are self-managed and have control over their own strategies, programs and budgets; but state funding agencies and legislative bodies shape public institutions through legislated conditions (e.g. specification of tuition charges) and regulate specific activities (e.g. conditions for performance reporting attached to particular parcels of funds). In such systems the private sector will be liable to some controls of the second kind but few of the first kind. This is the system model typified by American higher education and on the whole it is the one associated with the highest degree of academic freedom in relation to teaching and research;
3. *Centralized corporate model:* Higher education systems in which government and agencies controlled by government steer semi-autonomous corporate style institutions directly through the legal framework and funding regime; and ster them indirectly via performance, accountability and audit requirements; negotiated missions and activity or output contracts; performance-based formula funding that shapes behaviour; targeting of resources; voluntary competitive bidding for parcels of funds with conditions attached; and so on (e.g. among others OECD, 2008a, Chapters 2-3). Institutions typically have executive leaderships and financial autonomy are subject to centralised controls in some areas and possibly a comprehensive regulation in important areas that sits oddly with the presumption of corporate forms and financial autonomy. Typically research intensive universities and private sector institutions have more freedom than others but the conditions attached to research funding are more interventionist and shaping than under model 2. Sometimes the state works directly through its economic and other departments; in other cases it may work through a state agency with a partial nominal or real independence from government and some standing within the sector such as the funding bodies in the UK, the quality assurance regimes in many countries, etc. This is the system model, one particularly apt to the new public management, that was developed in the Westminster countries (UK, Australia and New Zealand) and has since become widely influential though not fully adopted in many other nations despite their varied traditions.

If there is a general world wide momentum it is towards model 3. Many nations have moved from bureaucratic model 1 to centralized corporate model 3, e.g. Japan. But because nations have different starting points, different policy imperatives and objectives, and nationally nuanced responses to the organisational principles that are increasingly held in common, they find themselves engaged in different reform processes. ‘Key national regulatory varieties remain’ (King, 2007, p. 415). For

example, the OECD (2008a, Vol. 1, pp. 91-96) detects country cases characterised by 'reducing state control and widening institutional autonomy', and country cases that involve movement from institutional independence to closer state steering.

In the last two decades, the era of communicative globalisation, the role and power of national government has both strengthened and weakened. On one hand government has at its disposal a set of policy and regulatory instruments of unprecedented effectiveness (see next section), especially those that pertain to transparent activity and performance and to financial reporting. On the other hand global developments mean that many higher education institutions (specially the research intensive universities) have become partly disembedded from the nation-state. Beerkens notes that globalization in higher education is associated with 'a process in which basic social arrangements within and around the university become "disembedded" from their national context due to the intensification of transnational flows of people, information and resources' (Beerkens, 2004). Disembedding occurs when activity taking place in the global space becomes sufficiently important to overshadow or displace activity in the national dimension or weakens the regulatory capacity of national governments. When some institutions become more disembedded from national regulatory frameworks than others, a national system of higher education becomes a complex amalgam with varying degrees of national accountability. This also stretches the capacity of existing steering instruments.

There is potential for disembedding in several areas. Global rankings mean that research universities are referenced against global models and templates, and the worldwide not national knowledge system and the expectations of a relatively small number of globally mobile staff and students; and not the policy objectives and systems of national government. A 2008 report to the UK HEFCE remarked that 'league tables may conflict with other priorities. There is perceived tension between league table performance and institutional and governmental policies and concerns (e.g. on academic standards, widening participation, community engagement and the provision of socially valuable subjects)' (CHERI, et al., 2008, p. 6). League tables create a fault line between policy and institutional interest and this is magnified at the global level. There may be a tension between the global strategies and priorities of the institution, and the global strategies and priorities of the nation simply because the institution is more absorbed than is the nation in the global dimension of action. Further, many institutions seek an increasing proportion of their funds from outside the national jurisdiction, for example in the export market. In research a growing proportion of funding is accessible at international and supranational levels.

Another set of examples of disembedding relates to teaching programs that cross national boundaries. By operating either virtually or physically across national borders, institutions exceed the boundaries of their enabling national legislation while entering the jurisdiction of other nation states. Some institutions seek accreditation outside their original national context (Altbach, 2003; OECD, 2004a); e.g. because of a lack of accreditation opportunities at home; or to use international accreditation to secure advantage in the national dimension or evade the requirements or prohibitions of national accreditation; and to enhance global recognition through accreditation by a reputable foreign accreditation body. National accreditation agencies also have

motivations for exporting their services (Eaton, 2003). There is also a small group of would-be global accreditation agencies with a vested interest in expanding the role of global referencing in accreditation. A further set of examples relates to research labour. The mobility of leading researchers is tending to segment national labour markets between a small group of the globally mobile and the rest. Governments and universities are under pressure to differentiate salaries previously held in an equal position across fields and institutions, and between individuals at the same level regardless of merit. The emerging alternative is two tier remuneration systems that will match the twin character of the global mobile/ nationally bound academic profession. For those governments that have traditionally regulated salaries centrally it is becoming increasingly attractive to leave that field to institutional managers. But this is difficult to achieve in national systems in which academic remuneration is still common to public service remuneration arrangements.

Performance-based funding: In many systems the new public management is associated with moves away from the use of complex synthetic judgement and evidence-based planning towards formula-based allocations driven by performance measures.

> Formula-based funding provides many advantages over alternative methods. In most countries, it has replaced a system in which time and resources were devoted to regulatory compliance. The de-regulation has allowed institutions more flexibility with increased institutional cooperation and innovation. Further, it gives transparency to institutional allocations: the criteria for the distribution of funds are typically clear to all involved and allocation no longer reflect ill-founded historical trends or the lobbying power of given institutions. Another positive feature of formula-based lump sum budgeting is that it is delivered directly to public institutions as a block grant, and the institutions decide on their internal allocation of resources. This gives institutions more flexibility and autonomy than line-item arrangements, enabling them to determine their preferred distribution of funds in accordance with their particular mission.
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> Targeted funds have the potential to steer institutions towards a better alignment with national economic and social goals. This is the case when funds are allocated on a targeted basis to achieve explicit objectives such as the improvement of the quality of educational programmes, the introduction of innovative curricula, the improvement of management practices, or the development of partnerships with the region where the institution is located. However, there is an important trade-off between the transparency of funding and the range of funding drivers necessary to improve the alignment with the government's various goals. Broad goals will demand a range of funding mechanisms but that will reduce transparency and risks increasing the transaction costs in the system. A second issue is that government's goals are wide-ranging so it isn't easy to tune the funding drivers to those goals without opening opportunities for perverse incentives (OECD, 2008a, Vol. 1, pp. 203-204).

Performance-based automata cheapen the economic and political cost of regulation, enabling system authorities to by-pass much of the routine dimension of consultation and consent, but over time may lead to the 'dumbing down' of policy and a lack of reflexivity in relation to the assumptions of the performance model and measures. This suggests it is not just routinely necessary to review the formulae but to retain at all times the option of bringing expert judgement to bear on the problems at hand. There is a parallel debate about the role of metrics versus peer review in research assessments. Metrics provide unequalled precision in tracking research and publications output (though not necessarily context and meaning) but are unable to identify the potentials of the new. Butler (2007) argues for a 'balanced approach'.

The OECD notes also that performance-based systems can trigger perverse effects.

> For instance, if institutions are funded on the basis of degrees awarded or credits accumulated by students, some may be tempted to lower their standards in order to improve their funding. This would require adequate quality assurance mechanisms in place. Another possible effect is to induce risk-avoiding behaviour among academics and administrators leading to an emphasis on outputs that are easily attainable and measurable (*e.g.* effort shifted away from hard-to-measure activities such as the development of creativity and problem-solving attitude). There are other instances in which the pursuit of a goal (*e.g.* improving completion rates by offering remedial courses) may have adverse consequences on another important objective (*e.g.* research activities or public service activities by academics). One way to address concerns related to the use of performance-based funding is to develop a balanced funding mechanism based on a mix of input and output indicators (OECD, 2008a, Vol. 1, p. 204).

At the same time, prospective funding systems based on synthetic managerial judgment can generate perverse outcomes if they reduce professional autonomy in areas in which grass-roots professionals are more competent than managers. The prime example is research, where the OECD voices a concern that the move to more short-term decision cycles and product formats that is inherent in new public managed research systems may inhibit fundamental creativity:

> The shift to project-based research funding in TEIs raises a number of issues that need to be considered in relation to the long-term development of the research and innovation system. Competitive funding may promote more ad hoc and short-term research in cases where evaluation mechanisms and incentive structures focus on quantifiable and 'immediate outputs'. As a result, researchers may be reluctant to engage in research that will not produce results that can be demonstrated over short time-spans. In addition, precisely because project-based funding is competitive, sustained funding is not guaranteed, which may impede the autonomy of researchers working in controversial fields. If project-based funding has a short duration, it may also mean that researchers need to spend time preparing applications to secure funding on a more frequent basis. Atkinson (2007: p. 19) remarks that young faculty in particular spend an excessive amount of time preparing project proposals. Liefner (2003) found that competitive or performance-based funding could have an impact on the type

> and field of research because some academics avoided research with riskier outcomes. Likewise, Geuna (2001: p. 623) notes that short-term research and less risky research may reduce the likelihood of 'scientific novelty'. Furthermore, Geuna and Martin (2003: p. 296) argue that research may become 'homogenised' because 'safer' research is rewarded. Morris and Rip (2006) point out that the stage of a researcher's career needs to be considered in relation to the type of research undertaken. Some of the questions raised are: — does the researcher need quick results to bolster his or her next job application? Is he or she senior enough to get a five-year rather than a three-year grant? (Morris and Rip, 2006: p. 256), and these questions are pertinent in the context of project-based funding (OECD, 2008a, Vol. 2, p. 114).

These comments are far-reaching in their implications. Competition in research grant allocations has the potential to sharpen quality and transparency and crate incentives to collaboration, but can drive short-termism, an all-too-easy adaptation of bright people to funding sources and ease of performance, and the inhibition of 'originality, innovation, risk taking' (Schmidt, 2009). This suggests the need to carefully review the core elements of current approaches to research management.

7.2 Australia

A Westminster system: In political economy and governance, and in internal organization and culture (see section 13), higher education in Australia remains close to the UK from where the nation and its founding universities derived (the oldest universities, Sydney and Melbourne, were founded more than forty years prior to Australia becoming independent in 1901). As with higher education throughout the world, including those of the UK, it is increasingly influenced by American ideas and models. Australia shares with the UK and New Zealand what can be called an Anglo-Westminster polity, in which strong state steering, with Treasury in a leading role, combines with devolution. As noted Australia is a good example of model 3 described above. Higher education institutions are self-managing corporate institutions; formally structured on the basis of institutional autonomy and academic freedom while influenced by governmental mechanisms, systems and requirements in many areas. In other words both academic identity and state steering are relatively well developed; though academic identity is stronger in the UK than in Australia and New Zealand. Australia diverges from the UK and New Zealand in one respect. It is a federal nation in which the State governments have formal jurisdiction over higher education. In practice the federal government is the dominant government because of its taxing and spending power. The states do not fund the operating costs of higher education institutions though they invest in selected areas, particularly in relation to research. The main role played by the states is to accredit the non self-accrediting institutions, meaning that they control entry into the higher education sector. More than 90 per cent of all students are enrolled in the 40 universities (all but two of them in the public sector) that are self-accrediting, but private sector students have been eligible for government managed tuition loans since 2007 and the private sector is growing.

The Dawkins reforms and after: As a Westminster system Australia was early subject to the New Public Management reform agenda. The key moment was the

1987-1992 system transformation led by the then federal Labor Party Minister for Employment, Education and Training, John Dawkins (Dawkins, 1987; 1988). It was a rare case of a government successfully implementing almost the whole of a major reform program. Dawkins began by abolishing the previous 'buffer' body between government and institutions, the Tertiary Education Commission, which he saw as captive of the sector and a potential obstacle to the sweeping new policy. Federal programs became subject to administration by the federal public service education department under direct ministerial control. The government saw higher education as one of the keys to lifting productivity and global economic competitiveness, and enhancing the role of manufacturing and services within Australia's economic profile. There was a new emphasis on the role of universities in creating identifiable economic benefits of a private and public kind. Dawkins set out to expand the number of graduates by 50 per cent, to tie the institutions more closely to policy and the administrative machinery of government and to treat them more like businesses. In a major departure from historical practice the Minister also encouraged institutions to raise money from non-government sources. It was hoped that in future much of their revenue would come from business and industry, tying them closely to economic development. This did not happen; but outside first degrees for domestic students, student charges were to be deregulated (section 9.2). The first full fee international students arrived in 1987 (see section 5.2) and a growing number of postgraduate programs became market-based. Research funding was partly separated from teaching funding and grounded in national objectives, though academic peer review was maintained as the basis for project grants; and incentives for industry-related applied research were installed.

The Dawkins-driven changes unfolded in the first half of the 1990s and by the middle of that decade the Australian higher education system had been greatly transformed. As noted the universities and CAEs were combined into an enlarged unitary university sector. The Minister used incentives and sanctions to encourage mergers to increase size and weight. Standardized definitions for funding purposes, output measures and data collections were installed. The sector was modelled as a mini-economy, in the form of a unitary competition for teaching and research funding from all sources. In practice funds for first degree teaching were still allocated by government fiat on the basis of historical distributions, and student HECS charges were closely regulated. However all universities old and new could not bid for contestable research funding even though only some had the capacity to do research across all fields (section 1.2). The Minister also allocated funds for organizational restructuring and innovations in services and teaching provision on a competitive basis, in the process discovering that small parcels of money could trigger widespread changes in behaviour.

At the same time institutions gained a new corporate freedom to control their budgets. Capital allocations were wound in with government grants for teaching and research and institutions were no longer penalized, via reductions in public income, for raising private monies. Institutional restructuring facilitated the modernized and entrepreneurial approach leadership and organization encouraged by the federal government. A notable feature of the Australian system was the creation of a largely new caste of institutional executives around the vice-chancellor/ president ('CEO'), and the strategic and operational effective freedoms allocated to the latter post

(Marginson and Considine, 2000). Increasingly university chiefs tended to see themselves as parallel to business leaders though they continued to be largely drawn from university ranks. One objective that Dawkins found it difficult to achieve was performance-related funding. This took longer than the other changes and was incomplete in execution. A comprehensive measure of research performance was developed, with a formula including research revenues, publications and doctoral student numbers. A parallel performance-based system was used to allocate funds for higher degree by research (principally doctoral) students. Performance in teaching eluded comparative measures but in the 1990s the federal government introduced schemes for rewarding outstanding teachers, and as noted it supported annual surveys of the employment outcomes of graduates and graduate satisfaction with their programs. Institutions were encouraged to adopt student satisfaction surveys. These instruments were fed into the emerging quality assurance systems.

Institutions were also encouraged to create output transparency and efficiency incentives in the management of academic units, triggered a transformation of internal cultures. Professional managers and executive deans centralized budget powers. The role of representative and participatory academic staff assemblies, shorn of power over resources, declined. At the same time Dawkins sought to encourage a transformation of institutional governance which continued to play out after he left the portfolio in 1992. Institutions were encouraged to restructure their governing bodies to more closely resemble corporate boards: smaller in size, with members independent of internal institutional interests and inclusive of business and financial expertise. Governing bodies were under state government control and only some were changed along the lines of the preferred federal model. The role of staff and student representatives was abolished or diminished in some but not all governing bodies.

All of these transformations were somewhat uneven by institution. Typically the post-1987 universities moved closest to the Dawkins template while traditional academic cultures and governance survived best in the oldest and strongest research-intensive universities that later organized as the ‘Group of Eight’. In the latter institutions academic boards continued to play a significant non–financial role. Despite this a notable feature of the changes was the uniformity of forms and behaviours that emerged. The old binary division disappeared. All higher education institutions sought to grow and expand market share on and off shore. All adopted performance scrutiny and allocations, weakened academic governance, introduced professional management, centralized authority in the CEO, and pursued non-government income earning options including the mass enrolment of international students. Under the Liberal-National Party government led by Prime Minister John Howard (1996-2007) there was little change in the system settings and the more corporate institutional cultures developed in the Dawkins reforms. The Dawkins changes continued to play out, though student HECS charges increased more sharply, per student government grants were reduced by more, and international students grew more rapidly. However, relations between government and institutions deteriorated in the Howard years. The government maintained tight control of domestic student places, maintained funding for those places below real cost levels and restricted institutional flexibility: for example in 2005 it required universities to secure government sign-off for minor changes between sub-disciplines in the balance of funded student load.

The New Public Managed higher education system after two decades of reform: Following the transformation instigated by the Dawkins reforms system management and policy culture look very different to those of twenty years ago. Australian institutions enjoy a high level of formal freedom in a system deregulated in many respects, but across much of their activity they are subject to central controls via the political economy of the system settings, especially financial scarcity; until 2009 the detailed regulation of government-subsidised student places; accountability and data requirements, bid-based schemes, and performance funding in research (and after the 2009 decisions other areas of activity: see below) There is a surprising degree of commonality of mission despite variation in capacity (see section 12.2).

Higher education institutions are self-accrediting and determine their own formal missions, strategy plans and mix of degrees and research activities. They control their own budgets and determine facilities and other developmental priorities. Government makes few direct demands in relation to the content of their activities; in fact the list of items pursued as national priorities and policies is narrower than was the case prior to the Dawkins reforms in 1987-1992. The main direct requirements have been in relation to plans and targets designed to improve equity in the social composition of the student body; this approach was extended in the 2009 budget as described in section 6.2. cross-border activities of institutions for foreign policy and national security goals. Institutions are not required to negotiate a comprehensive performance contract with government as in some other systems; and quality assurance has not been as intrusive or instrumental as in some systems (it is less directive than is UK quality assurance, for example: see section 8.2). In many areas government does not have a firm view of what it wants universities and other public institutions to achieve, and it is less directive in relation to the private sector, which enrols less than 10 per cent of students. For example institutions are free to pursue whatever community outreach activities that they choosey. International activities operate primarily outside detailed policy requirements in relation to the number and type of international students and the nature of cross-border research and other linkages with universities from other countries, except that the formal requirements of the Education Services for Overseas Students (ESOS) Act must be met in relation to immigration compliance and consumer protection. Through global activities are thus partly disembedded from national regulation the Australian government appears unconcerned about this despite the potential implications of the global work of higher education institutions for foreign relations, global security and trade.

On the other side of the coin, institutional income from government sources has been subject to strict bidding and/or reporting requirements; or distributed on the basis of formulae which ensure a high degree of compliance with government templates and objectives in institutions under pressure to maximise their financial outcomes. The compilation of complex research performance data and its use as a basis for funding ensures a high degree of detail government involvement in shaping research activity. With the exception of the Australian National University which has access to specialised research funds, the institutions all work within a common framework of financial incentives that ensures a high level of system uniformity. Because per student public monies have been sharply reduced since the mid 1990s even small

parcels of money have become crucial to institutions. Private incomes help but only the surplus from market-related activities can be used for core funding and public funding remains influential even though it is now a much smaller share of the budgets of each institution than it was two decades ago. Ironically, the Australian government has ensured a high degree of compliance not by investing in the institutions but by reducing their funds and thereby imposing scarcity. In other words control and financing can be coupled in more than one way and a reduction in government financial support does not necessarily imply reduced control. The Australia case shows that financial deregulation does not mean withdrawal of government per se, especially when it occurs in the context of a mixed public and private financial system in which the government source monies come with strings attached.

The regulatory tools of government operate alongside the deregulated freedom of institutions to raise and spend their own monies in almost every possible area except liquidation of public assets such as the land on which they sit. They also operate alongside (while having come shaping influence in relation to) a research grant system in which core basic research funding and some applied research projects are allocated on the basis of peer-reviewed academic merit by a national agency mostly independent of the ministry; and industry clients and researchers together determine some applied research agendas. The entrepreneurial and corporate financial freedoms provided to institutional managers, and the remaining scope for academic control over research and scholarship, are crucial safety valves that balance the more regulated programs and activities and the strong shaping effects of the government-framed resource drivers and competitive configuration of institutions.

However the political management of the system has not been free of friction. The abolition of the Commonwealth Tertiary Education Commission in 1987 opened an era of direct rule by the department and minister's office, as noted. Institutional compliance is necessary to the smooth running of the system, and Australia has a liberal public culture in which any tensions between institutions and government are liable to be reported and magnified, placing political pressures on government with possible electoral repercussions (for example, some universities are located in marginal federal electorates). In practice this has meant both that relations between government and institutions have become increasingly strained, the more so in that government has no longer used the tool of significance funding increases to buy cooperation; and also that over time the policy areas in which the government has sort to control institutions have become more narrow, hastening the government's withdrawal from a broad public good agenda and from detailed long term planning. There is only a certain amount of business that can be managed through direction without the placing too much pressure on the central authorities; and the logic of political decision making requires that agendas are kept open and most of the energy is allocated to managing short term issues and impressions. These circumstances have also hastened the reliance on apparently objective formula funding in place of individualised judgements and decisions about the circumstances of each institution; and the use of bid-based systems and performance-based systems of funding and accountability which nominally depend on voluntary compliance rather than direction (though in practice, given funding scarcity any form of funding can scarcely be ignored by institutions). In the lead up to the completion of the Bradley report in

December 2008 there was some pressure for the reintroduction of a new state agency in the form of a 'buffer' body between government and institutions that would be partly independent of direct ministerial control and enable longer term planning.

The larger tertiary education architecture: Higher education in Australia is one of two tertiary education sectors. The other is vocational education and training (VET) which is primarily regulated and funded at state/territory level, though in the past federal funding and industrial relations policy have been significant media for modernisation in VET. VET institutions have a broader network than higher education – there are public Technical and Further Education (especially TAFE) institutions in most provincial centres and there are over one thousand registered training providers mostly in the private sector – and enrol twice as many students as higher education, though these are mostly part time. VET curricula are a mix of basic literacy and other general education programs, standardised industry training based on 'competences' on the British model, and vocational programs in such fields as business studies, technologies, engineering and nursing which are similar to programs in higher education but of shorter duration. TAFE and some private colleges also franchise the early years of first degree higher education on behalf of universities, enabling enhanced access. A more recent development is for some institutions to offer higher education degrees in their own right, though here the pattern is uneven by state/territory. There are numerous unresolved policy issues in relation to VET and the VET/higher education interface. VET has been under-funded, more so than higher education, but the states/territories lack the fiscal capacity to overhaul the sector and its scope for private income raising is less than in higher education. The sectors overlap significantly at the level of two year tertiary programs ('diplomas' in the Australian context) and increasingly in degree offerings as well. While the structure of qualifications in Australia is regulated by an Australian Qualifications Framework (AQF), the high degree of overlap means that there is no stable division of labour between the sectors, and the fact that they are regulated and organised separately means that there is no common mechanism for managing contestability in the market, standards and quality regulation or student transfers. Higher education students pay HECS and benefit from its subsidised income contingent loan regime, VET students do not. Federal policy has focused on securing broader transfer routes between vET and higher education, partly to secure social equity in access to and the composition of higher education, partly the heterogeneity of teaching cultures and curricula (other-regulated industrial competences, versus academic curricula designed to create autonomous learners) have been stumbling blocks to harmonisation. A further difficulty is that degree programs in higher education enjoy considerably more social and vocational prestige than programs in VET, and higher rates of return, and VET institutions mostly have embryonic research cultures or no research culture. On the other hand the evolution of several cross-sectoral institutions with large scale suites of programs in both higher education and ET, mostly located in Victoria, meant that some progress had been made in working through cross-sectoral issues.

The Bradley (2008) report noted that both sectors fulfilled policy objectives, and both have 'equal value' (p. 179); that many students stand to benefit from offerings in both; and that their respective functions constituted both common ground and the basis for

a continuing division of labour. The absence of an 'efficient regulatory and accountability framework' common to the sectors was a limitation (p. 179), there are substantial barriers to credit transfer and cross-sectoral program articulation, 'the current system is complex for students to navigate' (p. 181), and inconsistencies in tuition arrangements had the potential to 'distort' decisions (p. 182). Further 'a threshold question to be addressed is whether all Australian governments sharing responsibility for VET and higher education continues to be effective and desirable… 'The panel considers that the case is stronger than ever for primary responsibility for regulation and funding of tertiary education to be located at the national level' (p. 182). It suggested that accreditation and the regulation of quality should be managed nationally on an integrated tertiary basis (p. 183). It also suggested that diploma funding arrangements should be common to both sectors; that is, both should function on the basis of the student 'entitlement' model and deregulation of student volume proposed for higher education, and the extension of income contingent loans funding to students enrolled in those programs (pp. 185-186). The Bradley panel also proposed a new federal-sate architecture in tertiary education:

> That the Australian Government negotiate with the states and territories to expand the national regulatory and quality assurance agency [i.e. TEQSA] to cover the entire tertiary sector (including vocational education and training and higher education) and that the Australian Government assume full responsibility for the regulation of tertiary education and training in Australia by 2010.
>
> The establishment of a new funding and regulatory framework and a new tertiary regulatory body will require the development of revised arrangements for governance of the tertiary education and training system. Key elements of the new governance arrangements would be the creation of a single ministerial council for tertiary education and training, the tertiary regulatory body itself, enhanced policy-relevant research and analysis covering the whole tertiary sector and coordination of labour market intelligence (Bradley, 2008, p. 184 and p. 190).

However, following the release of the report some opposition was expressed at state government level to a federal takeover of tertiary education policy and regulation. In the 2009 budget and related announcements the federal government responded to some but not all of these proposals. The role of TEQSA was to be in terms of higher education from 2010 onwards and extended to VET from 2013. 'This will help drive greater interconnection and partnership between the VET and higher education sectors to give students the best opportunity to develop the skills required for the workforce of the future' (Australian government, 2009, p. 31). This signalled the government's intention to pursue a timetabled part-convergence of the tertiary sectors. In addition the government adopted the Bradley proposal for a single ministerial council across tertiary education:

> The Government has set out an ambitious target to raise the proportion of young people achieving Year 12 or an equivalent qualification to 90 per cent by 2015 and announced an ambition to enrol and complete an additional 217,000 students at bachelor level or above by 2025, equating to 40 per cent of all 25 to

> 34 year olds. To enhance this interconnection we need an education system that is less fragmented and easier for students to navigate. It should be straight forward for students to enter post-school education and move between vocational and higher education as appropriate to enhance their skills and qualifications…Tertiary education in Australia should be a continuum of delivery, with better connections between sectors in both directions while avoiding one sector subsuming the other.
>
> To make this happen, the Government will establish the Ministerial Council for Tertiary Education and Employment (MCTEE), with responsibility for higher education, vocational education and training, international education, adult and community education, the Australian Qualifications Framework, employment and broader youth policy. The new Ministerial Council will focus the resources of states, territories and the Commonwealth Government on making sure that our shared investment in tertiary education is well directed and that young Australians are able to move through our education system with the recognition and credit that they deserve.
>
> The Government will commission the Australian Qualifications Framework Council to improve the articulation and connectivity between the higher education and vocational education and training. This work will ensure that competency-based and merit-based systems talk to and value each other and that we improve pathways and movements between sectors (Australian government, 2009, p. 43).

The extension of income contingent loans to diploma programs in VET was to be 'progressed' by the ministerial council. The issue of common funding was deferred. The development of a coordinated national approach to regulation in VET was to 'progress alongside arrangements for TEQSA' (Australian government, 2009, p. 64). Concurrently the federal and state/territory governments have commissioned a review of the Australian Qualifications Framework that is currently in train (Dawkins, 2009).

Summary of changes to government roles and agendas in 2008-2009: In sum, the 2008 Bradley report and the 2009 federal budget-related decisions foreshowed a number of changes in relation to system management and the relations between government and institutions. The details of these changes have been or will be dealt with elsewhere in this paper, as indicated:

1. First degree places are to be largely deregulated on the basis of a 'demand-driven student entitlement' model (section 2.2), with volume caps lifted from 2012 onwards and the question of the balance of enrolments between fields of study left in the hands of institutions. The extension of government-subsidized places to the Masters level has also opened the potential for greater institutional flexibility in determining the balance of activity and profile of provision in terms of level of study (section 10.2).
2. The government has introduced new mechanisms for performance-related funding in relation to social equity (section 6.2), and teaching quality and standards; and may also introduce further requirements in relation to the

reporting of research performance and the performance-based allocation of research funds (section 8.2).

3. The government has announced the establishment of a new 'independent' regulatory body, the Tertiary Education Quality and Standards Authority (TEQSA), which will exercise responsibilities in relation to standards, quality assurance, and the administration of the ESOS Act in relation to international education, and probably in further areas over time (see section 8.2). TEQSA will fold in some existing activities of state government authorities in relation to accreditation and market entry.
4. A new system of compacts negotiated between government and individual institutions will allow some flexibility and the nuancing of mission (section 8.2) though the scope for advanced levels of diversity will continue to be constrained by the system settings, particularly the continued government unwillingness to vary funding for the research mission or deregulate first degree tuition charges (section 12.1).
5. As explained immediately above, the government is giving consideration to the extension of a larger set of system architecture across the whole of tertiary education, encompassing vocational education and training (VET) as well as higher education (see above in this section). Reform in this domain will necessitate the negotiation of new arrangements for the regulation and probably the funding of VET, and over time may allow development of a more integrated cross-sectoral approach to pathways and curriculum development.
6. The government has decided to divide the present responsibilities of its departmental arm Australian Education International, which is responsible for both the oversight of the legislation governing international education, and the market promotion of the Australian industry, a position of potential conflict of interest between the industry and the student whose consumer interest the ESOS Act is designed to protect. Responsibility for regulation of the Act will be transferred to TEQSA.

Likely future developments: The likely future evolution in system governance and management are difficult to forecast. Though the volume of enrolments will be deregulated, with the implementation of the new system completed by 2012, the government will maintain a cap on the cost of tuition for domestic (local) students, i.e. price will not be deregulated. If it is possible that first degree tuition prices might be deregulated – and given that the research intensive universities have no obvious means of substantially augmenting their incomes except by charging tuition prices that reflect their positional advantage in the local student market, they will still pressure for price deregulation (section 9.2) - at present there is no sign that this will happen. Further developments may take the form of an extension of the performance funding requirements introduced in the 2009 budget, and possibly also in relation to research; development of the role of TEQSA as a body intermediate between government and institutions (see section 8.2); the implementation and subsequent development of the notion of individualized compacts between government and institutions (also discussed in section 8.2); and the evolution of the developments hinted at in 2008 and 2009 concerning the federal-state and larger tertiary education architectures. The requirements in relation to social equity in the composition of the student body (see section 6.2), which have set a firm target for the system and will

generate individual strategies and targets to be negotiated between institutions and government; and have significant monies attached to them; appear likely to exercise a considerable influence in the shaping of institutional behaviours. The government does not appear likely to return to the earlier form of governance in which it had a more comprehensive set of policy expectations concerning the system but enforced them less completely. The NPM Westminster regime of a spare defined set of nation-state requirements that bite effectively into institutional behaviour, regulating the autonomous institutions from a distance to clear effect, appears set to continue.

8. Government steering and mechanisms

- *What are the policy or funding tools the government has in directing universities to achieve the government's policy objectives? Do they work? How does the government assess the performance of universities in achieving the government's objectives?*

8.1 Global overview

Mechanisms of the New Public Management: In New Public Management systems of governance the central figure is a choice-making self-actualizing agent operating within the framework of a larger system of policy objectives, product definition and behavioural incentives that shapes the nature of those choices. In higher education this general formula for social organisation has become associated with the evolution of instruments and mechanisms whereby governments manage institutions within a common system, and institutional executives manage their component units and the activity of their personnel. Nikolas Rose (1999) identifies two kinds of policy and funding tool which he describes as tools of 'accounting' and 'audit' respectively. These will now be briefly reviewed. Note that this discussion is relevant also to internal institutional management (section 13).

Techniques of *accounting* impose modes of financial calculation on work previously governed by professional or bureaucratic norms. The organization becomes understood not as a set of policies or activities but in terms of financial flows. The work is reinvented in the form of economic markets or more often, quasi markets in which some forms of economic markets (such as producer competition and shadow prices) are installed. University departments are obliged to order their affairs as if they are cost centres or profit-making firms and these logics enters the mentality of agents. In this manner '"Public" objectives such as value-for-money, efficiency, transparency, competitiveness, responsiveness to the customer' become translated into "private" norms, judgments, calculations and aspirations' (Rose, 1999, p. 151). Manager-leaders and a new group of academic entrepreneurs often secure enhanced financial autonomy, while their institutions and units have been rendered 'governable in new ways'. The various institutions, and the various fields of study, are standardized, rendered equivalent and more readily re-ordered. Techniques of accounting include:

- The allocation of funding on the basis of competition, integral also to techniques such as entrepreneurship, user-oriented production which might be

based on price signals or alternately on decision-making pricing, output formats and performance management. Competitive allocations can be managed on the basis of reward for performance, bids or in fully fledged economic markets designed to secure market responsiveness and allocative efficiency. Competitive bidding systems maximize the potential for external shaping of the work; they enable funding agencies to secure influence on priorities and directions through relatively small parcels of marginal funding.

- The use of real or shadow pricing as an allocative device, a means of valuing activities or outputs using policy-based criteria external to costs of production.
- User-oriented production which solidifies an external linkage to the 'user' or client; which in the case of systems might be the government itself.
- Encouragement of entrepreneurial behaviours in which executive leaders (or in the case of internal institutional configurations, unit managers and research centre leaders) are independent, strategically minded and decisive and characteristically search for and work on opportunities for income raising. Entrepreneurial agents typically retain some or all of what they earn and have the scope to explore a range of possible prospective activities. One trade-off for governments is that in entrepreneurial systems they typically exercise less direct control over outputs; though entrepreneurial behaviours can be combined with such techniques as competitive bidding to resecure control over the content of activities. Pursuit of the activities that government wants becomes seen by institutions as a money-making opportunity to exploit.
- Output measures in quasi-product formats (publications, citations, citation impact measures, research user impact measures, etc.), with the measures made transparent and linked to funding allocations, in association with other techniques of accounting and audit, enable detailed micro-regulation. Links between performance measures and outputs drive a close focus on those outputs and any necessary internal changes needed to maximise them. Externalized performance measures, for example administered by government funding councils, often draw on erstwhile internal mechanisms. 'There has been a process, well exemplified in the UK, of externalizing functions that lie at the heart of academic autonomy, namely peer review and self-evaluation, so that they become instruments of external oversight' (Henkel, 2007, p. 93).
- More generally, performance management regimes encourage institutions (and their units) to carry out those activities that secure the profile of performance that is favoured by the funding system. There is much scope here to use variations in the content of resource dependency (the activities favoured, the scope for initiatives, the relative size of different rewards for activity, the temporal rhythms and intensity of the pressures exerted by the resource drivers, etc.) to secure variations in the outcome.

As summarised by Rose (1999) techniques of audit nest the institution in systems of external accountability that can be used to drive internal reforms to meet externally validated goals and output measures. Techniques of audit shift the 'control of control' outside the university while positioning institutional managers (and academic agents within institutions) as wholly responsible for their actions. Decentralised autonomy and centralised accountability are necessary to each other (see also Salmi, 2009b).

'These arrangements retain the formal independence of the professional whilst utilizing new techniques to render their decisions visible and amenable to evaluation… autonomisation plus responsibilisation' (Rose, 1999, p. 154):

- Funding based on contracts with government can directly introduce government-determined objectives and actions into work programs.
- External audit of activities works retrospectively rather than prospectively. All else being equal audit is likely to entertain a broader range of activity than prospective performance regimes and that sense enables greater institutional freedom , but it is also a potentially powerful change system for government, readily able to devalue whole lines of work, snap path dependence and reinvent the next round of activities through the sanctions meted out. Note here that external quality assurance systems can vary in the degree to which they function as direct audits of quality from outside, or support internal quality controls consistent with high levels of managerial and academic freedom.

Nevertheless, suggests El-Khawas (2009), accountability-oriented systems can also be re-colonised by the professoriate, redeployed on a decentralised basis and used to drive student learning agendas. The crucial determinant then is the objectives.

8.2 Australia

New Public Management steering in Australia: There is some discussion of the steering instruments used in Australia in section 7.1 on system management, section 1.2 in relation t research and section 5.2 in relation to internationalisation. In sum, the Australian government uses a combination of conditions attached to prospective funding, retrospective performance-related funding, bid-based allocations for specific programs governed by government-determined criteria, comprehensive reporting of expenditures of public monies, and standard data requirements. As noted in section 7.2, the regulatory tools of government designed to secure particular policy objectives operate alongside the corporate financial freedom of executive managers especially in relation to private incomes, and an academically-determined and client-determined system of funded research. These domains of managerial and academic discretion are an essential balance to the tight requirements of state agendas and controls. At the same time, the whole system works within the constraints of a very tight funding regime in which only privately funded incomes can be readily expanded, and then only in areas which are non-core in relation to research capacity and the education of domestic students. In particular the constraints on research funding, through the holding down of government support for basic research, limits to the number of postgraduate scholarships and the 60-70 per cent cost funding of government supported research projects, impose a very tight financial control on institutions which force them to cross-subsidise research by whatever means they can. This discipline has been enhanced by global university rankings which turn primarily on research performance. The resulting regime of high scarcity redoubles the impact of the government shaping of behaviour even in relation to small scale parcels of funds.

Conditions are attached to prospective funding in the case of government subsidies of domestic student places and government-funded grants for research projects, centres

and performance related block grants programs that provide for research capacity: the Institutional Grants Scheme, the Research Training Scheme and Research Infrastructure Block Grants (see section 1.2). The 2009 budget has added performance related funding in relation to social equity (see section 6.2) and teaching quality and standards (see below). Bid-based funding on the basis of government-determined criteria is an instrument frequently used in Australia, for example funds for infrastructure, buildings and facilities such as the Education Investment Fund distributions in the 2009 budget; some research grants including schemes designed to secure university-industry collaboration; funds for regional development, 'structural adjustment' (section 12) and parallel initiatives; project funding for teaching, communications systems and service development. Comprehensive reporting in relation to expenditures is designed to ensure that monies are allocated to government purpose. Standard data requirements ensure that the system as a whole is more transparent to steering and teaching places, teaching workloads and research projects are managed in a common way across all institutions. These requirements also set cross-field templates used in the internal organisation of institutions.

Research, that classical domain of academic freedom, is driven by the global knowledge system in that academic peer review shapes the allocation of the most prestigious grants, and also extensively affected by government intervention. The performance-related block grants direct research-scholars towards standard journal article and book publication. The new performance-related ERA program will provide incentives to focus publication in those journals ranked most highly by ERA. The block grants for higher degree by research completion encourage a continual expansion in the number of research students despite the modest number of government scholarships for postgraduate research. The Cooperative Research Centre, Australian Research Council Linkage and commercialisation-related schemes are influential in foregrounding industry links and as noted in section 1.2 have shifted an increasing proportion of university research from basic to applied activity.

Do these steering mechanisms work, in the sense that they have achieved their objectives? For the most part, yes. The regulatory requirements and programs discussed above have shaped behaviours in the ways intended. The government's macro economic and political objectives have also been met, in that public outlays on higher education in Australia (0.8 per cent of GDP) are now well below the OECD average (1.1 per cent); the education export sector is the third largest export industry in Australia, and arguably the most successful of its type in the world. Further, as noted in section 5.2, notwithstanding the decline in the resourcing of teaching and research time signified by a severe deterioration in student-staff ratios (Bradley, 2008, p. 15), the reputation of the national system appears to have been sustained for now, the product of competitive institutional marketing in combination with a quality assurance system which emphasizes self-regulation, and a policy framework in which responsibility for maintaining the material determinants of quality appears to have been transferred from the government to the institutions themselves (although the Bradley report did break that pattern by indicating concern with staffing levels).

There have been some areas where steering has been less than fully successful. The attempt to steer basic research more closely to national priorities by applying a

national priority requirement has not made much difference to the content of research activity – with the national priorities defined in broad terms, and a large number of project applications nominating at least one of the priority areas, little competitive advantage is gained by doing so. The attempt to drive an industry orientation in research as a means to build a stronger funding base from industry has changed the applied/basic distribution of activity without building a strong line of funding from industry. Similar schemes in many countries have had a similar outcome. There appears to be a secular ceiling on the willingness of industry to fund university research on an ongoing basis, which operates at about 5 per cent of the cost of all university research. Under the system settings, despite the funding and reputational incentives to lift research performance, because of public funding scarcity and limitations to the level of the surplus obtainable in fee-based markets, there has been relatively little development of research capacity in the weakest third of the public universities. There are doubts about the research quality underpinning PhDs in at least some programs. The attempt to drive a performance focus in relation to teaching has run up against significant obstacles intrinsic to this domain. There are no comparative objective measures of teaching performance (though the OECD's AHELO program may develop these, see section 2.2). Subjective indicators of student satisfaction vary according to contextual factors, and are a blunt instrument in terms of diagnosis: e.g. they do not distinguish between poor quality communication in the classroom, and intellectually demanding programs that students may resist. The fact that some institutions are in high demand regardless of teaching quality cruels the potential of a quality driven market in teaching and this factor will continue to inhibit the consumer/producer dynamic in the post-2009 'demand-driven' system.

Performance-related funding of teaching quality in the 2009 budget: As noted the May 2009 Australian government budget introduced a new scheme for the performance funding of teaching as foreshadowed by the Bradley report. The government stated, in relation to the performance funding of both teaching quality and institutional programs focused on SES equity:

> To ensure that Australia's reputation for quality remains high, the Government will introduce at-risk performance funding for universities from 2012. The Government intends to hold higher education institutions accountable for the significant public investment in the sector. One of the main ways of doing this will be through the use of a new funding stream to ensure universities meet agreed attainment, participation, engagement and quality targets. Establishing institution-level performance targets in areas such as teaching and learning and low SES progression recognises that every university has a role to play in improving outcomes for Australian students and communities.
>
> In 2010 the Government will work with the higher education sector to develop a robust set of performance indicators. The indicators will include measures of success for equity groups as well as measures of the quality of teaching and learning. Performance funding will be available from 2012. In 2011, there will be transitional arrangements in place. An amount equivalent in value to the increased indexation on learning and teaching grants will be available on a conditional basis in 2011 and paid as a facilitation payment for agreeing to the

> first year of institutional targets. This will be rolled in to the base in 2012 for those institutions that sign up to the new measures. From 2012, those universities that meet agreed institution level performance targets will receive performance funding. The amount of funding available is roughly equivalent to 2.5 per cent of funding currently provided for teaching and learning, as recommended in the Bradley Review.
>
> This initiative is intended to ensure that universities target their efforts to improve outcomes for students. Funding will be distributed to institutions on the basis of their share of Commonwealth Grant Scheme funding. Unlike the previous Learning and Teaching Performance Fund, this will not be distributed on the basis of relative performance to allow all institutions to be rewarded for achieving improvements. It will create a strong incentive for universities to provide the best possible learning opportunities for their students and to invest the effort necessary to help under represented students achieve their further study goals. There will be a set of clear institutional targets developed for each Table A provider [which includes all the public universities] and TEQSA will provide an independent assessment of whether the targets have been achieved (Australian government, 2009, p. 33).

The new Tertiary Education Quality and Standards Authority: At the institutional level the Australian system has focused on quality assurance for almost two decades, but a national system was not put into place until 1999. The Australian Universities Quality Agency (AUQA) audits the existing institutions on a five year cycle. While from time to time an AUQA report will make comments that have the potential to impact institutional reputation, AUQA audits are focused mostly on the quality of internal mechanisms for monitoring and assuring standards, and do not in themselves provide a tough external scrutiny of the institutions. In the Australian system there is a widespread feeling that the present AUQA does not provide a sufficiently comprehensive or rigorous scrutiny to identify all potential reputational risks. The Bradley report's comment was that: 'the quality assurance framework is too focused on inputs and processes and does not give sufficient weight to assuring and demonstrating outcomes and standards' (Bradley, 2008, p. 115). The fact that AUQA had been unable to identify any problems flowing from the deterioration of staffing ratios in the last decade suggested that a different kind of scrutiny is needed. At the same time there was a need to provide national coordination of accreditation; as there was potential for an applicant to be accredited in some states but not others.

The Bradley report proposed a national regulatory body to address both accreditation and standards. It suggested a ten year accreditation cycle for non self-accrediting institutions, and controls over the use of the title 'university'. Applicants wanting to use that title would need to demonstrate research capacity and activity in at least three disciplinary fields (Bradley, 2008, p. 127). The 2009 budget confirmed that the new TEQSA would be established, though there is as yet no information on composition, resourcing, detailed mandate or guidelines. However it is clear the TEQSA will play a role in defining performance indicators in relation to teaching and learning outcomes.

> The new quality assurance arrangements will ensure that domestic and international students have better information about how our higher education institutions are performing and that taxpayers can see whether value for money is being delivered and the national interest is being well served. Our higher education institutions are experienced in measuring their research performance. They will become equally good at demonstrating students' academic performance and documenting what students learn, know and can do.
>
> The Tertiary Education Quality and Standards Agency (TEQSA) will enhance the overall quality of the Australian higher education system. It will accredit providers, evaluate the performance of institutions and programs, encourage best practice, simplify current regulatory arrangements and provide greater national consistency. TEQSA will take the lead in coordinating this work and establishing objective and comparative benchmarks of quality and performance. The agency will collect richer data and monitor performance in areas such as student selection, retention and exit standards, and graduate employment.
>
> It will evaluate the performance of universities and other higher education providers every five years, or whenever there is evidence that standards are not being met. If problems are identified, TEQSA will be able to recommend sanctions up to and including withdrawing the right to use the title of 'University' (Australian government, 2009, p. 31).

TEQSA will also be empowered to audit particular 'areas of risk' such as regional provision, or a particular field of study; and will be empowered to advise the minister as its sees fit. The question of the use of the title 'university' was left to TESQA to discuss. As noted in section 7.2, TEQSA will focus initially on regulation and quality assurance for higher education and, from 2013, extend itself to VET. The Budget statement emphasised TEQSA would 'build on the strong foundation established by AUQA' and there would be 'extensive' consultation with states/ territories and the higher education sector in its creation. Sensitive to concerns about the potential for more and more effective central agency intervention, the budget statement added: 'The Government will ensure that the new arrangements are developed in close consultation with the sector. Discipline communities will 'own' and take responsibility for implementing academic standards (working with professional bodies and other stakeholders where appropriate) within the academic traditions of collegiality, peer review, pre-eminence of disciplines and, importantly, academic autonomy' (Australian government, 2009, p. 32). How that pans out remains to be seen.

Compacts between government and individual universities: In 2006 while still in opposition the Labor Party developed the notion of 'compacts' between each individual institution and the government in order to facilitate the development of more diverse missions while tuning both policy and activity more closely to mutual need. The Bradley report did not discuss this potential mechanism, but with the Labor Party now in government that notion was revived in the 2009 budget papers.

> The Australian Government will introduce mission-based compacts that outline the relationship between the Commonwealth and each university… the

> Australian Government will work in partnership with universities but define clear and consistent targets for improvement and reform which will trigger reward payments. Compacts will be in two parts, one covering teaching and learning and the other covering research. The Minister for Innovation, Industry, Science and Research will be responsible for the research elements and the Minister for Education will be responsible for the teaching and learning elements. The two Departments will jointly develop with each university a compact reflecting a whole-of-university mission and a coordinated response to the Government's reform agenda… Compacts will facilitate alignment of institutional activity with national priorities. They will also be used to help set performance targets for each institution in relation to quality, attainment and participation by students from under-represented groups. Consultations on the framework for compact development will occur in 2009. These will include close consultation with the sector on appropriate tools and indicators to measure performance at institutional level (Australian government, 2009, p. 47).

Given that both the federal department through the compacts process, and TEQSA, have been charged with the development and use of performance targets and 'rewards-based funding' it is unclear where the demarcation will fall. Perhaps the powers and potentials of a nominally independent TEQSA have yet to be resolved.

9. Funding sources

- *Will the proportion of fees being paid by students at their own expense increase significantly in future? Do you have a view on what proportion of the cost of student education is likely to be funded in this way in the foreseeable future?*

- *Do you have a view about how far other sources of funding not originating from tax revenues will contribute to the income of universities?*

9.1 Global overview

As was noted in section 2 there is a secular trend towards increase in the proportion of funding of higher education that comes from non-government sources (OECD, 2008a, Volume 1, p. 48 and pp. 172-178). The trend is almost universal. As part of this trend there is an increase in the proportion of income that is paid by students who constitute much the largest potential source of non government monies. 'The trend towards greater cost-sharing is associated with pressures on public budgets' (p. 172). It can take the form of newly introduced tuition fees, increases in current fee levels, the creation of special tuition tracks or higher tuition tracks for distinctive categories of students such as international students or older students, the imposition of user charges for previously free or subsidised services such as student accommodation, the reduction of student grants or scholarships and/or the substitution of loan schemes in place of grants, reduction in the subsidy of student loans programs, and limitations on the growth of the subsidised public sector while a private sector

characterised by higher tuition levels is encouraged to fill the gap in supply of places. There is much worldwide variation in fee systems and their incidence (pp. 185-196).

The OECD suggests that there is no general social or economic law about the association between the degree of private cost in a national system, and the extents of access, participation and equity; but there is abundant evidence especially from the USA that students are responsive to variations in net prices and this sensitivity is enhanced for students from poorer backgrounds. This suggests that reductions in cost have more effect on the participation rate of students from some social categories than others, providing an argument for targeting (OECD, 2008a, Volume 1, pp. 181-182). Changes in grant schemes have more effect on participation rates than changes in loans schemes or in work opportunities (p. 183). It is possible to design tuition increases that are nested in better student living support, or income contingent loan repayment schemes of the Australian type, so as to have negligible effects on participation rates (pp. 183-184; see also Chapman and Tulip, 2008). But the OECD states that there is also 'strong evidence that financial aid affects study persistence in tertiary education, particularly for more disadvantaged groups' (p. 184). A problem for all national systems to overcome is that students from disadvantaged backgrounds are more likely to unduly emphasise the costs of tertiary education and be inhibited by loans, while under-estimating the medium-term and long-term benefits (p. 184).

9.2 Australia

History: When tuition fees were abolished in 1973 in Australia, those fees were paid by a minority of students; most students received tuition scholarships from the federal government; and covered only about 10 per cent of the average cost of programs. Pat-cost fees were introduced for international students (then subject to quota) in 1979 and the full cost fee market for international students was announced in 1985. The next year a small charge was introduced for domestic students, and in 1988 the government resolved to introduce the Higher Education Contribution Scheme at 20 per cent of average course costs. Institutions were also offered the opportunity to charge direct tuition fees in some vocational postgraduate programs and over time that area was to be more completely deregulated. The 1990s saw successive increases in student payments under HECS, as a percentage of the average cost of courses, particularly in law and business studies (see section 2.2). Over the next twenty years from 1988 the level and proportion of the income of higher education institutions derived from student charges was raised significantly, particularly when a more constrained public funding regime was introduced in 1995 and 1996. The most dynamic areas of growth were HECS related revenues and international student fees. The level of income from sale of non core services, investments and philanthropy also increased, albeit from a low base in the case of philanthropy. Table 14 summarises the trends in private funding as a proportion of total funding.

It is interesting to note that a parallel reduction in the role of government funding has occurred in China, albeit over a somewhat shorter time interval. Rong (2009) shows that between 1998 and 2005 the proportion of funding of higher education institutions that derived from fiscal appropriations fell from 61.9 to 44.7 per cent, while funding

from tuition and fees rose from 14.6 to 34.3 per cent. What took 14 years in Australia took 7 years in China.

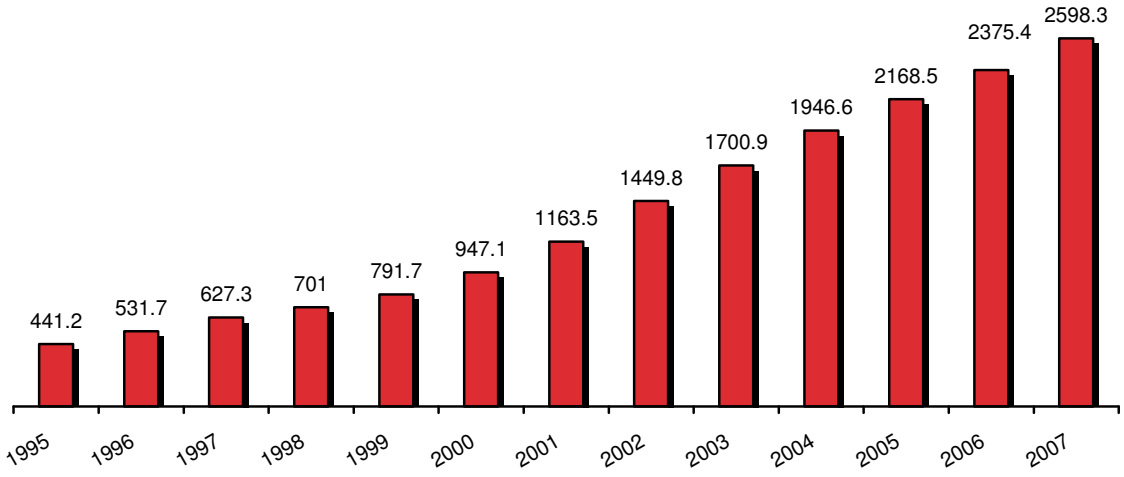
Table 14. **Revenues of higher education institutions by percentage weight of source Five year intervals 1992-2007**

source	1992 %	1997 %	2002 %	2007 %
all governments	64.1	54.9	44.1	44.5
student payments, income contingent tuition schemes	13.2	14.7	16.6	16.0
International student fees	4.8	7.6	12.5	15.0
all other fees and charges	5.6	7.3	8.7	6.9
consultancies and contracts	n.a.*	n.a.*	4.0	4.6
investments	3.6	4.0	1.8	4.8
donations and endowments	1.8	1.2	n.a.#	1.1
all other sources	7.0	10.2	12.3	7.1
total	100.0	100.0	100.0	100.0

* included in all other fees and charges # included in all other sources
Source: DEEWR, 2009 and related

Since 1995 in Australia the growth of revenues from international students has been exceptionally dynamic. Data in Figure 7 are in current Australian dollars:

Figure 7 **Annual revenues from international student fees, higher education 1995-2007 ($s million)**

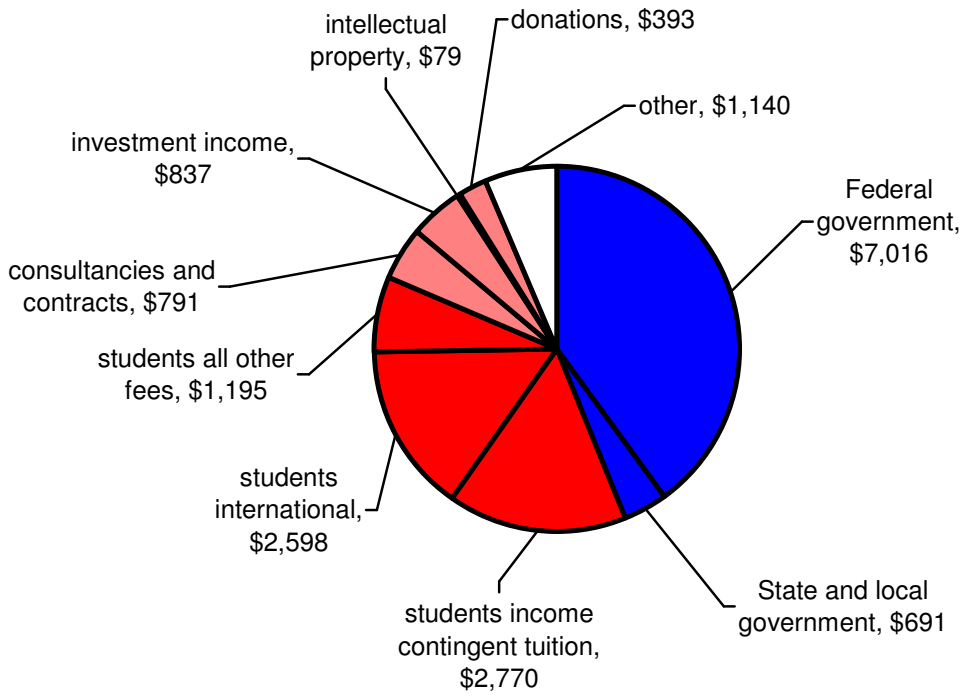


source: DEEWR, 2009

Funding breakdown in 2007: The data in Table 14 and Figures 7 and 8 cover only the public universities and the government subsidised private institutions Australian Catholic University and Notre Dame University. In 2007 the federal government paid for 40.5 per cent of the income of the higher education institutions and all governments together 44.5 per cent. Student tuition charges and fees contributed 37.9 per cent, including 16.0 per cent for all charges related to income contingent tuition schemes and 15.0 per cent for international education. Investment income constituted 4.8 per cent, consultancies and contracts 4.6 per cent, donations a low 1.1 per cent and intellectual property just 0.5 per cent. There was considerable

variation between institutions, in the balance of funding between income sources. The older universities in the Group of Eight received most of the income for investments and donations. The level of dependency on international fees (see section 5.2 of this paper) and federal government monies for teaching varied greatly. For example federal grants for teaching as a proportion of total revenue were just 13.5 per cent of total income at the University of Melbourne but 28.5 per cent at Victoria University just 6 kilometres away and 39.7 per cent at Charles Darwin University in the northern Territory (DEEWR, 2009).

Figure 8. **Funding of higher education institutions by source 2007, Australian dollars million)**



Effects of the recession: As elsewhere in the world, the global recession has triggered a sharp downturn in Australian university incomes from investments, which as Figure 7 indicates constituted AUD $837 million in 2007. It is also expected that the recession will lead to a reduction in the level of donations and bequests. There is no sign of negative effects in relation to student fee income at this stage.

Future possibilities: In relation to the possible sources of enhanced funding, the Bradley panel stated that:

> From the trends in funding levels for the sector over the last decade and the international comparative data, the panel has concluded there is a need to both adjust the level of base funding15 for higher education and ensure through indexation that the real value of this public contribution is maintained. For Australia to have a sustainable, internationally competitive higher education system, the combined total of funding from the two principal sources –

> Commonwealth base funding and student fees – must be sufficient for institutions to recruit and retain high-quality staff in the face of increasing global demand for academic staff and an ageing academic workforce. It must also be sufficient to provide and update facilities, services and materials to ensure quality learning experiences for students. Given the relatively high proportion of private contribution to expenditure on higher education in Australia compared with other countries, the panel believes that there is no strong case for further general increases in the costs to students. Rather, the emphasis of reform should be on increasing the public funding base and setting it in a framework appropriate for a more diverse and dynamic higher education sector (Bradley, 2008, p. 152).

However, in the 2009 budget the federal government did not adopted the Bradley report recommendation for a 10 per cent increase in the base rate of federal funding of domestic student places. This means that there is still a live debate about whether future funding increases will come from public or private sources. The research intensive universities in particular have been left in a difficult position by the funding decisions in the last two federal budgets and are likely to seek a further revision of the funding settings. These institutions are under strong global competitive pressure to augment their research performance as measured in the rankings. The question is, where is the money coming from? In 2008 the government announced that they would no longer be able to offer full fee programs to domestic first degree students, which raised AUD $120.4 million in 2007 and had good prospects of future growth. In 2009 it announced that while domestic student volume would be deregulated there would be a continued cap on domestic student funding rates at a level below average costs in most disciplines. Under these circumstances growth in domestic student volume has little attraction to the research intensive universities in the Group of Eight. Four of the eight already have more than 9000 international students, suggesting they are near a practical limit on their capacity to keep increasing income from that source. The government has so far shown little interest in making the kind of substantial increase in basic research support targeted to performance that supports the UK counterparts of the Australian Group of Eight. In the absence of UK-style moves on public research funding, the research intensive universities are likely to press again for the deregulation of tuition prices for domestic first degree students, in order to use their positional advantage in the domestic student market in the American manner.

10. Degree structures and the role of postgraduate education

- *What will be the evolving relationship between undergraduate (Ug) and postgraduate (Pg) education, as illustrated by, for example –*

(i) the number of Ug places as compared with the number of Pg places;

(ii) the changing nature of first degrees;

(iii) the growth in the prevalence of second degrees; and

(iv) following from (ii) and (iii) above, will undergraduate degrees be seen as a less valuable qualification or an intermediate qualification? How will the future

relationship between Ug education and Pg education affect each other?

10.1 Global overview

Global practices in relation to the balance of undergraduate and postgraduate study are highly varied. Much is determined by the structure of first degree study: three years, four years or longer; varied within the same system; or organised in double degrees. We can detect two strong templates: the four year first degree norm in the USA and China, and the three year British norm for general degrees that has been taken up in the Bologna process. In the longer term these two templates – which reflect different lengths of secondary education - will need to be reconciled in a standardised matter. Mobility is a powerful driver of standardisation.

The area of greatest worldwide similarity is doctoral training, though considerable variation remains. This is undergoing tensions and pressures for change. A study of the global terrain by Kehm (2009a) notes 'widespread dissatisfaction with the traditional forms of doctoral education and training' (p. 155). In part this is because of enhanced global mobility – though the degree of mobility varies considerably by nation - and the need to facilitate that mobility. Despite the fact that doctoral education is more internationally convergent than first degree education there remains considerable variation in its structures, contents, duration and synchronisation with national career systems (OECD, 2008a, Volume 2, pp. 94-95); and new pathways and forms have developed, particularly in the UK (Kehm, 2009b) In part the tensions around the doctorate reflect a pluralisation of the work destinations of graduates in many nations and the consequent need for stronger generic skills, enhancing concerns about supervision quality. The long wait between graduation and stable career employment inside or outside universities is also a source of dissatisfaction. This has triggered moves in some nations to reduce the passage of time between first degree and doctoral completion, and in future academic staff shortages may exacerbate such developments, redoubling questions about quality. Despite these uncertainties, in many nations doctoral enrolments are growing more rapidly than total enrolments in universities. Australia is one of these nations.

10.2 Australia

Trends in enrolments: The modest growth of domestic student numbers since the mid 1990s has been associated with some change in the distribution of students between levels of study. Between 1997 and 2007, the total enrolment of domestic students in Australian higher education increased by 25.5 per cent. However PhD students increased by 57.3 per cent, while coursework Masters students, the majority of whom pay uncapped tuition fees, rose by 91.1 per cent (see Table 15). The primary growth in Masters by coursework programs was in business studies.

Table 15. **All non-international students by level of study, Australia, 1997-2007**

level of study	1997	2007	change 1997-2007 %
PhD	20,922	32,914	+ 57.3
Masters by coursework	39,828	76,112	+ 91.1
all postgraduate	120,942	181,561	+ 50.1
all undergraduate	466,616	557,985	+ 19.6
total	603,156	756,747	+ 25.5

Source: DEEWR, 2009

It appears likely that the relative increase in the size of the Masters coursework stream will continue. In part it appears to reflect a desire for a higher level credential to secure positional advantage, coupled with supply side marketing of differential credentials by institutions. Such a tendency is self-perpetuating, sustained by the growth of numbers in both undergraduate and postgraduate business studies. In addition, postgraduate entry is used for medicine in about half of the Australian medical schools. However, the undergraduate degree continues to be the principal gateway into the majority of professional fields. If there is a *general* tendency to shift occupational entry to postgraduate level at work, it is too early to clearly identify it.

The reform to the curriculum at the University of Melbourne (2009) that is associated with the implementation of the 'Melbourne Model' may contribute to an additional relative growth in postgraduate enrolments. The University has established six general undergraduate programs with all but one of these explicitly designed as preparatory for a second degree at Masters or doctoral level. Professional training in such fields as law, medicine and health sciences, veterinary science, engineering and education has been shifted to postgraduate level. The University of Western Australia has formally committed itself to a similar model. It is too early to tell whether these examples will be taken up by other institutions in the Australian higher education sector and thereby come to constitute the leading edge of a larger shift from undergraduate education to postgraduate education as the terminal degree.

10.3 Personal note

The author judges it likely that over the next 15 years there will be a large scale shift of occupational training and certification to Masters level – this already apparent in business, education and some health sciences – and that the Melbourne model of a general undergraduate degree followed by postgraduate occupational training will become widely imitated among the research intensive universities, and possibly more broadly than that. A complicating factor is that there may be pressures to follow the USA and China towards another norm, that of the four year undergraduate degree, especially if it becomes apparent that three year graduates from Australian universities have difficulty in accessing Masters level programs offshore.

11. Relations between research and teaching

- *What will be the evolving relationship between research and teaching-and-learning? Is there an optimum balance between teaching and research in the distribution of staff activities in research active universities? If so, what?*

11.1 Global overview

'Despite the fact that teaching is often held to be closely linked to research, it is arguably quite separate from it', remarks the OECD (2008a, Vol. 2, Page 75. The ideology of the teaching-research nexus is strongly held in many higher education systems. The empirical evidence of the nexus is less strong (for reviews of the discussion see among others Neumann, 1996; Halse, et al., 2007). A key difficulty is that the activities are heterogeneous and the quality of one does not share a unitary set with quality of the other. They are attended by very different practices and expectations. We expect most academic staff to engage in teaching and all to strive for high professional standards. It would be unrealistic to expect all staff to engage in research or critical published scholarship. Even research-intensive universities contain few departments where everyone publishes; and in most research universities a minority of staff publish in good quality journals each year. The larger competitive research grants are normally accessed by a smaller proportion. Stellar research outputs - in terms of both fecundity and the contribution to original and breakthrough knowledge - are carried by a small minority of academics, perhaps 2 per cent or less. Research and teaching can be standardised in relation to each other only in terms of units of time. There a zero-sum relationship prevails: all else being equal the more there is of one the less of the other. One possible empirical approach is to map time spent on one against the quality of the other and to do so reciprocally. Some studies suggest there is a zero or negative correlation between teaching time and orientation to research but research is associated with small positive effects on teaching.

Nevertheless as Halse and colleagues note (p. 728): 'while scholars have argued for a closer, more productive relationship between teaching and research, policy makers continue to be vexed by the matter of how this relationship should be construed'. Because the actual research profiles of individuals are so divergent, and high quality research so concentrated in a small number of individuals, the notion of optimum balance has little practical meaning across the whole academic staff of an institution or system. Instead we can suggest two ground rules. First, all teaching at university levels ought to be informed by comprehensive critical scholarship in that part of the field of study under consideration in the teaching program; and this engagement with critical scholarship (it might be confined to critical reading, which arguably is more crucial to teaching than is engagement in writing) distinguishes teaching in higher education from teaching in other domains. Second, researchers and scholars who operate at the global cutting edge of their field ought to be free as far as possible of the demands of administration, teaching and institutional leadership except to the extent that these activities contribute to the quantity and/or quality of their research and scholarship. Arguably, the standard practice of universities of leveraging researcher-scholar reputations for the purposes of generic leadership is flawed and

works against the longer term interests of the institutions. Researcher-scholars of high calibre are increasingly crucial for institutions and systems. The point is driven home every time that a new global research ranking is released.

Arguably the growing attention given to university research rankings and publication/citation metrics is having three effects. One is to bring high calibre researchers formerly located in laboratories and institutes outside higher education into the university system. The second is the growth of research specialist within the institutions. Table 2 noted the incidence of these positions in Australia. The third is to shift some of the organisational efforts of institutions that were formerly devoted to establish a pattern of universal engagement in research across the whole university staff, to attracting, retaining and supporting the most productive. These changes in organisational culture are yet to have a full impact in Australia, and the ideology of the nexus is as yet unchallenged, but many executive managers already follow their logic.

12. System homogenisation and diversification

- *Is the system moving towards differentiation or homogenization? Will the growth in the perceived value of research activity and the emphasis on it over teaching affect the whole system – or will role differentiation become the order of the day? Do you see a trend toward specialization, so that the range of disciplines offered by comprehensive universities is narrowed?*

- *What will be the place of technical or professional education in higher education? For example, will the model represented by Imperial College (London), MIT, the German Fachhochschule and ETH or by some business schools multiply?*

- *What will be the role and significance of higher education institutions not directly funded by tax revenues (i.e. "private" universities) in the future development of the higher education sector?*

12.1 Global overview

Diversity within a system arises in four principal forms. The first occurs when differences in mission are enforced by regulation. One example is the presence of second sectors alongside research universities in some countries (OECD, 2008a, Vol. 1, pp. 97-98 and 104). Most often these second sectors have an explicitly technical or vocational orientation to the local region; for example in Finland and the Netherlands; or the vocational education and training sector in Australia. In the case of public systems in the USA, there can more than two sectors and not all of the non research institutions have an explicitly vocational mission. Another form of regulated differentiation is nuanced missions within the research university sector, for example the technical universities in Holland at Eindhoven, Delft and Twente. The Indian Institutes of Technology (IITs) resembles these institutions in some respects – they are high prestige institutions with a technical and business orientation – but are also a stand-alone sector, separate from other research-based institutions.

> It is of paramount importance to establish a clear and positive vision of professional/vocational tertiary education either as a distinct sector or as a specialization of some institutions within a unitary system. Raising the profile of vocational tertiary education is not easy. The aim should be to promote quality professional and vocational education and training within a tertiary sector which is strongly employer-oriented and closely integrated with the specific labour market needs of each locality and region. The objective is for tertiary-level vocational qualifications to generate their own high status so that professional/vocational programmes are not seen as second-best. In a number of countries where expansion of tertiary education continues and where academic qualifications have been dominant, expansion should concentrate on professionally orientated programmes (OECD 2008a, Vol. 1, p. 146).

The situation of second sectors varies. The key issue is that of their status and resources viz a viz the orthodox research universities. As the OECD remarks: While the German second sector has always been relatively strong and Finland's second sector is well regarded, the Dutch Hogeschulen feel overshadowed by the universities and are attempting to break into the research activity dimension (Marginson, et la., 2007). The Dutch technical universities are well regarded – as with ETH or MIT the dual tags 'research' and 'relevance' constitute an advantageous position - but arguably the element of diversity is not as great in that case. Regardless of the problems of lack of status and academic drift that attend some second sectors, we can say that this form of differentiation remains viable and might even become more important if rankings based on research performance continue to subordinate the majority of institutions. However to the extent that orthodox academic cultures become established in the second sector, this form of diversity becomes difficult to sustain. As van Vught notes, all else being equal the larger the influence of academic culture the less the extent of diversity (van Vught, 2009b, p. 11).

The second form of diversity occurs when the national system authorities manage a common institutional template on a competitive basis, as in the UK and Australia (OECD, 2008a, Vol. 1, p. 99). Institutions become differentiated on the basis of different levels of performance, status and resources, while formally equivalent in other respects. These differences become reproduced in the form of differences in income- and status-dependent capacity. As Table 16 shows in relation to the Australian case, there are marked differences in the level of research activity between the institutions in the top and bottom segments. Yet all are free to compete for the same pool of research funding. This form of diversity is also likely to survive, as long as system authorities continue to value cross-system formula funding on the basis of a common template, and continue to rely on competition as a device to drive performance and ensure the fulfillment of specific policy objectives. However, it can be argued that the absence of diversity of mission or in the extent of specialization, important forms of diversity other than market inequality are unduly suppressed; the more so as market competition itself tends to drive homogeneity in purpose and profile (Huisman, et al., 2007). Isomorphism is one of the constants of single sector competitions (Marginson and Considine, 2000). As van Vught remarks also, all else

being equal, the more uniform are the environmental conditions within which higher education institutions sit, the less the extent of diversity (van Vught, 2009b, p. 11).

The third form of diversity occurs via the distinction between public sector and private sector institutions (Guruz, 2008; OECD, 2008a, Vol. 1, p. 44ff; Vincent-Lancrin, 2008, pp. 79-80). This form of diversity often overlaps with one or another of the first two forms. Formally this is a distinction based on legal status but in practice it is manifest often as a distinction in mission (e.g. public institutions may be uniquely mandated and funded for research and expensive professional training programs), and also in orientation. Private institutions often work harder in the market. For the most part they lack the prestige of the leading public sector institutions. Some nations such as Brazil, the Philippines, Mexico and the USA have long had sizeable private sectors while others such as Chile and the Malaysian private colleges are more recent policy inventions. Private institutions vary in the extent top which they are state subsidized (OECD, 2008a, Vol. 1, p. 45), and in some nations included alongside public institutions in a common regulatory framework; and the extent to which they present themselves as distinct. The public/private line is blurred in some nations and sharp in others. In general the role of private institutions is increasing, except in research. Only in the USA and a handful of other cases do private institutions sit alongside the leading state universities as primary producers of knowledge. However, below the research sectors, in many nations the role of private vocational institutions is advancing (pp. 44-45). For-profit private sectors are on the whole more viable than they once were; and in some cases are moving successfully into higher quality echelons in the market, for example the University of Phoenix in the USA.

The fourth form of diversity arises spontaneously in the historical process. This is diversity prior to system development. The difference between MIT and Harvard is not so great – both are stellar research universities that could readily employ each other's staff – but to the extent that MIT emphasizes engineering and other applied sciences more than does Harvard, this is a product of their respective histories, not an act of sectoral formation or market differentiation by a system manager. The same is true of the other high status quasi-vocational or professional institutions. Note that in every case also they sustain an advanced research mission: this is a modest level of diversity; though it points to the fact that institutions free to determine their own mission and not forced to behave according to pre-determined missions or rules of competition can be distinctive. This form of diversity is often easier to detect on an international scale (e.g. the different cases discussed by Shattock, 2009b, p. 34). The US is large enough to maintain a good deal of naturally originated diversity; and in a sense European higher education –currently on the brink of a comprehensive classification and multi-purpose ranking that will give it whole system definition for the first time (van Vught, 2009a) – embodies this form of natural diversity. In moving to become a system European higher education must both standardize itself according to common elements, thereby reducing the potential range of diversity; and also express those general and national forms of difference that will be retained, thus defining diversity and making it transparent for the first time (Huisman, 2009).

But the status of the comprehensive science university is now very strong, and this is reinforced within the de facto global system that now constitutes the sector. This

suggests that if left to themselves, institutions of divergent history and thereby natural diversity are liable to converge toward the dominant template. The OECD's preferred approach to diversity is a system with a broad range of institutional types, large and small, comprehensive and specialized, global and local in orientation, teaching-only and research-intensive; and to render the choices transparent. Most would agree. The question is how to get there. We now know that competition reform alone is more likely to create homogeneity than diversity. This suggests that a policy framework more likely to be successful would be to combine (1) institutional freedom to evolve, with (2) the provision of state incentives that encourage institutions to fulfill certain identified missions, for example research intensive, medical university, technical institute, specialist business school, film and television school, regional college.

Is the global system moving towards differentiation or homogenization? It is moving to a differentiation of status (rankings sharpen the status differentials, making them more explicit and reproductive) but a greater homogeneity of role. To some degree nation-states can correct the drift to sameness. More plural approaches to international rankings and classifications can also help, for example a separate ranking of sec ond sector vocational institutions or systems. It is apparent that unless states intervene in institutional evolution specialist institutions face difficulties. There are stellar exceptions to this generalization, such as the London School of Economics or the London School of Hygiene and Tropical Medicine, that are well established. There are also narrowly focused vocational colleges at the other end of the food chain. But for the most part the natural development is for institutions to accumulate functions and become more comprehensive over time because that creates economies of scope and size. Institutions are much more likely to merge than split.

Will the growth in the perceived value of research activity and the emphasis on it over teaching affect the whole system – or will role differentiation become the order of the day? Research functions will continue to be the primary engine of institutional status. That is as close to an iron law as higher education ever gets. Even the liberal arts colleges in the USA, the one obvious exception to the generalization, make a point of hiring leading scholars; and this sector is much smaller and slower growing than the doctoral institutions. Research will continue to command great prestige than teaching. Research functions will also spread across more institutions and more staff because of the wide application of research skills in a knowledge economy, which is a different point. However, teaching will probably also increase in status in absolute terms. Given this fact; and given the fact that he concentration fo research performance will trigger some divergence between teaching and research functions (sections 1 and 11, it is possible that largely teaching focused academic institutions could develop or be engineered. Governments will then face a challenge analogous to the vocational sector problem of building and sustaining the status of those institutions.

A more likely development and a more feasible solution would be for comprehensive institutions to bifurcate between a largely teaching focused undergraduate school and a graduate school that is closely joined to research. In other words the teaching-research nexus would survive mostly at graduate stage (while sustaining its present tensions there). In part this bifurcation already exists in some comprehensive

research universities. It remains for it to be turned into a virtue and that can only be done by renovating undergraduate teaching its resource provision.

12.2 Australia

Australia is a test case for the potential and limits of diversity of the second type. There is less diversity than in the UK system with its specialist institutions and more varied kinds of research mission nested partly in a longer history of university evolution. Though research capacity and achievement varies dramatically in Australia, competition on the basis of a common research university mission and funding formula has sustained a 'one size fits all' approach. All institutions recruit international student population paying full price tuition. All bid for the same kind of projects; nearly all offer law and engineering; and all would offer medicine if they could. There are real differences in mission but they are not codified. Australia has eight research universities that are competitive at the global level, being in the top 200 or 300 on all measures. The same number of universities again were funded for basic research formation earlier in their history and could evolve into globally strong research institutions if supported for that. A third group of universities of technology is a strong vocational model in the Australian context, and several of them have large international student populations, but dependence on applied research limits their global potential. There is also the large vocational education and training sector (section 7.2) which is classified 'tertiary' though not 'higher education'. There is an interesting group of universities that house a large VET division. These ought to provide superior flexibility and opportunity profiles but have been inhibited by the lack of fit between the academic curriculum in the universities and the competency-based curriculum in training, as well as regulatory and funding differences.

Nine out of ten students are in the 38 public universities but private sector enrolments have doubled in size in the last decade. Private sector students are now eligible for income contingent loans for tuition. This has triggered the emergence of many new specialist providers, mostly in business education and many operating as for-profits. There are also two private universities with high status professional programs and some federal research funding: Notre Dame Australia in Perth and Sydney, and Bond University on the Gold Coast. Both universities are small but will grow. In another generation the private sector is likely to be a more significant factor in Australia. The private sector has one distinct advantage, and contribution, in that it is able to sustain specialist institutions that have almost disappeared from the public sector.

Table 16. **Segments of higher education sector, Australia, various indicators**

Segments and universities	*M*	*non curr't. asset*	*total stud*	*fee-paying intern'l*	*incom all source*	*incom from intern'l*	*PhD students and their share of all students 2006*		*proportion of income 2006 from federal $s for:*		*new ARC DGs for*	*share total RIBG funds*
		2006	*2006*	*2006*	*2006*	*2006*	*number*	*share*	*teach*	*res'rch*	*2008*	*2005*
		$s m			*$s m*	*$s m*		*%*	*%*	*%*		*%*
GROUP OF EIGHT												
U Melbourne	Y	3613	43,389	10,376	1190.9	191.6	3764	8.7	15.2	14.4	112	13.7
U Sydney	Y	3590	45,848	9680	1210.5	148.1	3093	6.7	15.8	14.4	98	11.6
U Queensland	Y	1784	37,518	6607	937.5	107.7	3096	8.3	19.7	16.6	71	9.4
U New South Wales	Y	1744	41,259	8788	830.5	119.6	2600	6.3	16.6	15.3	87	8.9
Australian National U#	Y	2273	14,553	3246	868.0	41.8	2059	14.1	n.a.	n.a.	78	7.9
U Western Australia	Y	1438	17,761	3421	569.3	44.2	1654	9.3	15.4	15.0	35	7.6
U Adelaide	Y	789	19,290	4903	473.8	58.6	1638	8.5	18.0	17.2	41	7.5
Monash U	Y	1867	54,824	17,087	1052.3	190.7	2549	4.6	18.0	12.2	75	6.9
OTHER PRE-1987 U's												
U Tasmania	Y	367	17,471	3972	316.2	26.5	1029	5.9	30.9	13.7	10	2.7
U of Newcastle	Y	874	25,570	4797	364.9	35.9	787	3.1	31.7	11.9	31	2.4
U of Wollongong	N	517	21,875	8620	298.7	55.1	924	4.2	24.8	12.5	32	1.7
Flinders U	Y	215	15,418	3172	239.2	24.9	762	4.9	27.8	10.6	9	1.7
La Trobe U	N	801	28,317	5619	386.3	47.1	1102	3.9	30.5	7.6	15	1.6
Murdoch U	N	446	13,917	2328	209.7	23.4	774	5.6	27.9	10.9	5	1.6
Macquarie U	N	1048	31,126	10,468	397.2	111.4	1242	4.0	16.2	10.3	36	1.5
Griffith U	Y	1052	35,335	8358	478.5	96.4	1209	3.4	28.3	6.7	23	1.5
U New England	N	318	17,482	1387	176.4	11.2	586	3.4	31.9	11.1	2	1.2
Deakin U	Y	797	33,202	6715	440.7	67.5	844	2.5	27.2	4.7	4	1.1
James Cook U	Y	566	15,378	3308	241.6	21.7	569	3.7	36.8	8.6	11	1.0
ATN (U's Technology)												
Queensland UT	N	742	38,524	5106	503.3	68.2	1096	2.8	30.3	6.8	24	1.1
U Technology Sydney	N	1031	32,712	8954	397.6	94.7	1051	3.2	24.5	7.3	12	1.0
Curtin U Technology	N	673	39,459	16,501	510.7	115.8	1461	3.7	24.7	5.3	9	0.9
U South Australia	N	773	33,410	10,422	385.0	63.0	916	2.7	36.4	5.9	14	0.8
Royal Melbourne IT U	N	1302	41,447	17,894	553.7	142.0	1150	2.8	25.0	4.8	5	0.7
OTHER PUBLIC U's												
U Western Sydney	Y	777	32,935	4470	380.9	37.1	650	2.0	41.2	4.8	12	0.7
U Canberra	N	288	10,858	2365	126.7	16.3	211	1.9	33.6	4.6	2	0.2
Swinburne UT	N	474	17,390	5815	318.8	54.9	521	3.0	17.9	4.1	12	0.6
Victoria U	N	644	20,180	5547	327.9	40.5	595	2.9	23.3	2.9	0	0.4
Edith Cowan U	N	689	23,989	4984	251.7	38.0	394	1.6	37.9	3.0	1	0.3
Charles Darwin U	N	230	5396	244	142.5	2.9	187	3.5	22.5	5.0	2	0.3
Southern Cross U	N	166	13,883	3046	119.5	12.4	462	3.3	37.3	5.6	2	0.3
Charles Sturt U	N	599	34,147	5817	254.7	13.0	409	1.2	37.1	3.3	3	0.6
Central Queensland U	N	169	25,305	13,899	292.1	145.0	224	0.9	18.6	1.5	0	0.2
U South'n Queensland	N	225	25,243	8895	160.0	25.4	171	0.7	38.5	4.6	1	0.2
U Ballarat	N	264	10,430	5798	182.8	48.2	169	1.6	19.3	1.8	0	0.1
U Sunshine Coast	N	127	5153	1146	67.1	7.9	69	1.3	41.4	1.6	0	0
PRIVATE U's												
Australian Catholic U	N	172	13,967	2575	145.6	19.6	280	2.0	40.2	1.8	0	0.1
U Notre Dame Austral.	Y	117	5636	583	44.8	4.9	43	0.8	19.1	0.9	0	0
Bond U	N	n.a.	4635	2643	n.a.	n.a.	63	1.4	n.a.	n.a.	0	0
MINOR SITES*												
[various]	--	--	1920	237	65.3	1.8	15	0.8	33.4	1.1	0	0
TOTAL	--	*33,630*	*984,146*	*250,794*	*15,913.0*	*2375.4*	*40,511*	*4.2*	*23.8*	*10.3*	*878***	*100.0*

n.a. = data not available * Australian Maritime College, Bachelor institute of Indigenous Tertiary Education. Australian Defence Forces Academy included with U NSW. ** includes CSIRO 1, Walter and Eliza Hall Institute of Medical Research 3. # ANU has restricted eligibility for RIBG funding because it receives special research support additional to that provided to other universities. Med = Medicine Faculty (Y=Yes, N=No). Dollar amounts in current prices. Non curr't assets = non current assets including investments and other financial assets; property, plant and equipment; and investment property, etc. Research student share = number of research students as a proportion of all students. IGS = Institutional Grants Scheme, awarded competitively on the basis of research performance. New ARC DGs = new Australian Research Council Discovery Grants, awarded on academic merit in all fields except medical sciences. RIBG = Research Infrastructure Block Grants.
Sources: DEEWR 2009; Australian Research Council.

The system settings of international education have particularly negative implications for diversity. The policy and regulatory framework used to build the export sector has been highly effective, in part because it has operated on a uniform basis without regard to individual institutional mission or strength. With one exception, *all* institutions have been required to grow international students each year on an average basis on the basis of the standard business model that shapes the whole industry. This includes Australia's most research-intensive universities that in contrast with their counterparts in other nations are mass access institutions (albeit subject to capacity to pay) in the cross-border market, while functioning as elite hard-to-enter institutions in the domestic market. In this manner the market leaders have been mobilized to place their established prestige behind the building of brand Australia with spill-overs to the market position of lesser institutions. The exception is ANU where special research funding allows it to evade most of the pressure to build commercial revenues, though this plays out in ANU engineering and business.

There is broad agreement across the 38 public universities that low diversity is bad for the country. But no institution wants to withdraw from the research mission (status is all and research is status); and so far no government has moved to abandon formula funding and the uniform export incentive. Government could only do so by re-forming a binary system, or creating a system with several classifications along American lines, which would be politically explosive. Alternatively it could negotiate individual missions based on variations in funding, but this is to move away from formula funding run by middle level public servants and into the hands of political fine-tuning and expert judgement, which would be difficult for the minister to control. The last approach seems too politically difficult unless it is placed in the hands of a semi-independent authority. That again would mean the government losing a measure of control. The decision in the 2009 budget to establish 'compacts' (see section 8.2) in theory would enable nuanced mission planning. But to leave compacts in the hands of the federal department without changing the system settings is to refrain from a serious effort to create mission diversity. The budget created one other avenue for the nuancing of diversity of mission: a USD $267 million 'Structural Adjustment Fund' to be disbursed by the minister over four years. Australia is creating some elements of (2) above, instruments for state sponsored mission specialisation, albeit at a modest fiscal level. It has not found a way to create (1), the capacity of institutions to evolve their own distinctive pathways. The system's financial settings still constrain this.

The Australian system gestures towards diversity but has remained homogenized since the Dawkins reforms. There is no change in the offing at present. The ideology of the research university (like the ideology of the teaching-research nexus) remains near universal yet it is honoured more in the breach than the practice. This lack of fit between stated mission and real mission is itself a handicap because it conceals a situation in which no one is doing well enough: half the universities cannot fulfil the research brief, and elite research institutions build volume in the global market. Among those institutions that are predominantly teaching focused, to name their primary mission as 'teaching' is to threaten them as directly as possible. Thus the status of teaching and the institutional mission of teaching are held down. It will take a bold government to structure diversity and a still bolder government to provide the financial means and the freedoms to institutions to create their own pathways.

13. Governance and management

- *How will management, governance and infrastructure provision in universities change?*

13.1 Global overview

In its advice to member governments the OECD urges that they build strategic capacity in their institutions. We are still in the period of new public management reform (OECD, 2008a, Vol. 1, p. 123), though the current prescriptions are more university specific and knowledge industry specific than earlier blueprints:

> To meet their missions, TEIs [tertiary education institutions] need to be able to identify areas of high priority and move resources there. TEIs cannot be strong and successful if it is impossible for them to determine strategy, set priorities, identify teaching and research portfolios, and adapt their organisational structure to adjust to a changing environment. Institutional governance structures are therefore of paramount importance (OECD, 2008a, Vol. 1, p. 120).

The reduction of direct state control in many countries is associated with 'less involvement in the running of TEIs on a day-to-day basis, and the introduction of new forms of supervision and influence through accountability mechanisms'. These trends have led to a 'strengthening of the power of executive authorities within TEIs, increasingly being appointed for their leadership and managerial qualities in addition to the traditional academic leadership skills, a 'loss of power and influence by existing collegial bodies'; and also an increased involvement of non-institutional personnel in governance (p. 121). If most nations have not adopted the American model of an external board of trustees, there are nevertheless widespread moves part way towards that model (p. 124). All of these trends are apparent in Australia (see below).

Perhaps the driving change is the strengthening of executive leadership, and strategic budget allocation, and the concomitant weakening of collegiality:

> The collegial model however leaves a weak role for institutional leadership as illustrated by instances in which the ability of rectors and deans to lead effectively is constrained by democratic academic self-governance and by their being elected by internal bodies.46 High levels of faculty autonomy result in a structural tendency to adopt a path of least resistance rather than to take strategic decisions that involve making choices between faculties or giving different priorities to their plans. It also limits central university resources in favour of maximising faculty allocations (OECD, 2008a, Vol. 1, pp. 124-125).

Likewise the European Commission's prescription for modernisation in higher education is for less regulation, more autonomy, more funding for innovation and the empowerment of better leadership with more authority. It also argues that universities

should ‘take greater responsibility for their own long-term financial sustainability’, and seek partnerships with corporations (Mora and Vieira, 2009, pp. 80-81); though inescapably, the capacity of universities to source outside funds is a function of their operating environment and particularly the viability of business and industry.

The OECD discussion might have given more attention to the need to sustain strong creative academic cultures able to lead in matters of research and teaching, *without* depending on the old devices for propping up academic agency - collegial decision systems, professorial budgets and an opaque performance environment. Not all executive leaders are able to step back and let their academic faculty lead the institution’s knowledge agendas. But executive leaders must do so because however good they are, they cannot inhabit the intellectual world of every discipline and make decisions at the cutting edge of the knowledge economy. Some NPM-trained executives also place undue emphasis on financial incentives to secure control and drive behaviours. This approach is empirically unsound however. Money matters but university entrepreneurialism and enterprise have broad-based roots. The desire for revenues is not the only driver (Shattock, 2009a, 4; Williams, 2009). Making things, sustaining external relationships, the shock of the new, taking initiatives and risks: these are all acts of freedom attractive to many in higher education.

13.2 Australia

In some respects Australian institutions are well positioned for the challenges of the current period. The virtues of the new public management include executive systems that are environmentally aware, data smart, responsive, operationally smart and politically sensitive. At best those virtues are more developed in Australian universities than in most other parts of the world, the legacy of the Dawkins reforms (Marginson and Considine, 2000). Australian universities also have developed budgetary transparency and robust performance cultures. One suspects that without those assets, the heightened scarcity that is used as one of the primary instruments of policy would have driven the Australian institutions into a downward spiral. They have coped and moved forward in some areas under difficult circumstances only because their operational systems have been sufficiently strategically effective.

Institutions and their academic units are led by full time executives largely sourced from within academic ranks. The chief executive officer (president/vice-chancellor) usually has very considerable operational discretion although financial discretion varies in scale. Control of academic units is exercised by executive leaders through the budget power. For the most part academic assemblies retain a role in decisions about academic programs (though some program initiatives for the international market circumvent their authority) but not in budget matters. In some institutions academic assemblies have little or no role in governance. In many but not all institutions, academic staff retain a significant role in decisions about internal promotion, and to a lesser extent, initial appointments. The long term trend is for appointment decisions to be more affected by the institution’s strategic priorities rather than the reproduction of disciplines per se. Internal funding allocations tend to be competitively driven and are often linked in part (and sometimes in full) to performance measures. Those disciplines in the happiest state financially, able to

appoint young staff, are (1) those strong in earning non-government incomes, primarily business studies; and (2) those strong in attracting competitive research funding. Corresponding to the decline in the role of academic staff in governance, the proportion of teaching staff holding tenured or even full time posts has steadily declined – more than half of all teaching is by casual employees. In general, the academic staff in the happiest position are those with research track record and research grants. There is more scope for exercising academic freedoms and taking initiatives, including initiatives, in research than in relation to teaching programs.

The performance of governing bodies has improved. Governing bodies have seen an overall trend to smaller size, more representatives from business and finance, and a lesser role for elected staff and student representatives. Generally, governing bodies have moved from the university community orientation to a supervisory and prudential external orientation, though there is considerable variation between institutions. On the whole university services and operational units are well developed. Some but not all universities have robust academic cultures with a capacity for localised imagination and initiative and particularly effective off shore, where operations are often less constrained than at home. In the of the newer universities, where academic cultures are embryonic or less robust, executive overhang and corporate styles of operation can choke off the possibility of autonomous academic development. Here the neglect of basic research both as a practice and a goal is seriously inhibiting. The Australian model of enterprise university is an impressive machine for making things work and solving problems but too readily loses the academic/corporate balance that is essential to the effectiveness of contemporary research institutions.

What are the contemporary trends in management and governance? The trend of the 1990s and early 2000s to large super-faculty groupings all social sciences, all sciences and engineering, etc.), under lieutenants of the vice-chancellor (with titles such as pro vice-chancellor, appears to have halted. This was a late Roman strategy of dividing up empires that seem to have become too large to manage. Perhaps communications and financial systems have now improved sufficiently to make these moves less necessary. The downside of the super-faculties was that they imposed a second layer of generic management on top of the disciplinary fields. The growing emphases on basic research and on researcher and client driven inter-disciplinarity suggest that disciplinary identities need to be strengthened. These factors might also encourage a forking between teaching organisation and research organisation, consistent with the renewed emphasis on research concentration for performance. It is likely also that in Australia, despite the continued dependence on the international student market, broader global agendas will also expand. However, much depends on the extent to which system settings develop to encourage more nuanced missions.

14. General and summary 1: Change in universities and systems

- *What are the discernable major pressures in the evolution of the higher education sector? In this context, how are universities going to change? And how are higher education systems going to change?*

14.1 Global overview

Most of the pressures on higher education systems and institutions are in continuity of those prevailing through the period of mass higher education. These pressures include the need to expand the scale of teaching and handle socially differentiated and culturally diverse student populations, while at the same time upgrading the quantity and quality of research; the need to engage students more effectively while mass modes of teaching are dominant and resources are increasingly constrained; the challenge to connect effectively with, and meet the needs of, a broad range of stakeholders; the problem of adequately reproducing the academic profession in the context of its boom-bust demographic profile; the need to meet ongoing new public management requirements for the modernisation of organisational systems; the problem of designing and implementing a functional division of labour within national systems; the need to work on a more plural set of funding sources admit continuing and increasing constraints on public sector coupled with the reluctance of business and industry to take more than a marginal role in funding; and last but not least, the need to provide a more effective and less harried environment for creative research and original scholarship amid all of the other pressures and demands (Peters, et al., 2009; Marginson, et al., 2009). All of these pressures are likely to increase during, and partly as a result of, the global recession. In addition, we can identify three challenges that appear to be more specific to the recent and current periods.

First, researchers and policy makers in a significant number of countries, including the United States and Japan, are increasingly concerned about the need to foster more effective student engagement inside and outside the classroom. While on one hand this appears to reflect the longer accumulation of concerns about the need to upgrade first degree teaching, the focus on student satisfaction in quality assurance processes and the now widespread collection of student survey data, and the growing weight of the notion of student as consumer, other trends also appear to be at work. In many countries the academic staff profile is top heavy as the large baby boom generation passes through the last decade of working life. All else being equal an older staff connects less effectively with 18-25 year olds, but the present gulf is not simply a function of age, it is also a function of different cultures. Young people live in a world of social connectivity based on the mobile phone, Twitter and Facebook and other networked media. Their communications are more visual or aural than those of their older teachers for whom written language is overwhelmingly predominant (Scott, 2009). Many of their lecturers do not share the networked social world and so are unable to communicate effectively in a shared space. An additional problem of disengagement is that in some countries most students, even full-time students, now work during the period of study and in many cases this significantly reduces the time available for on-campus learning and private study. Rates of work and working hours appear to have increased (e.g. in Australia. see James et al, 2007). Research suggests that some of the increased work reflects the need for subsistence incomes, in a period in which the availability of student aid monies may have diminished in some systems. Some of the increased work reflects the desire for discretionary consumer spending. The balance between these elements is unclear: it probably varies by national system and by region and student profile. More research is needed.

Second, the challenges posed by the extraordinary growth of open source knowledge are not as yet well and widely understood. This environment is moving very quickly. Every effort to establish a stable intellectual property regime based on the established powers seems to crumble even as it is put in place. Just as it appeared that academic publishing had been organised as an oligopoly based on a small number of multinational publishing houses, the Harvard Faculty of Arts and Science decided to place the world's premier set of journal papers on the Internet free of charge. Just-in-time free open access publication of papers is likely to become dominant. As with social networking, the human response to the new potentials created by technologies has irreversibly changed us. Technologies make it possible to reproduce knowledge immediately and infinitely at zero unit cost. Why wait 12 months for a monograph or two years for journal publication? The usefulness (and status-building potentials) of knowledge is maximized at the moment it is first disseminated. But open source publishing is not consistently amenable to private property regimes. Intellectual property regimes will continue to manage the pointy end of commercial product development, but will not longer shape the whole knowledge chain, if they ever did. Many universities and national system managers are still putting their main effort into searching for the El Dorado patent when the name of the game is discovery research.

Third, as this suggests globalisation is profoundly transformative of research intensive institutions, more so than for national systems as a whole. While everyone is aware of them, the challenges posed by globalisation are only now becoming better understood. Rankings have imposed new imperatives. Research institutions simply have to figure well enough in global rankings to sustain their role effectively in the longer term. But it is less clear how national systems can and should respond to that imperative. Globalisation makes it essential that national governments and funding agencies throw more weight behind their universities to build their global role. The rising stars of the higher education world all have stellar national investment behind them. But globalisation also triggers the partial disembedding of research universities from national systems. This raises two new sets of issues. One is that institutions focused on the global might peel away from their local and national constituencies and responsibilities. Governments are right to be concerned about this. The other is that nevertheless, national governments cannot exhaustively manage the global dealings of their universities, and hence control the balance between national and global objectives, even while using the now tried and tested methods of steering autonomous universities from a distance. If they try to control the global agendas of research intensive universities they try to do so will only inhibit performance. Direct, immediate initiation and responsiveness is essential to global relationships. But in the wake of the new public management governments are versed in the habits of transparency and micro-management and disinclined to fund something they cannot secure within a control system. Further, because governments do not always fully understand the potentials of the global setting, especially in relation to research, there is a natural tendency to focus regulation and policy on the inner world of the national system qua nation and address global effectiveness and global strategy as a 'spillover' from national system management. This will not serve the need. Globalisation calls for new approaches to the configuration of national objectives, resource systems and institutional autonomy; in other words for new governance.

14.2 Australia

Australia shares these challenges, especially the last. As a settler state and a recent creation as a nation Australia has a freedom to design itself that is not available to all nations though a thinner set of its own cultural resources with which to do this. Like all national higher education systems, Australia is also path-dependant and a product of its history, geography and culture. Successful in the export industry, it is nevertheless insufficiently global. Policy makers in Australia largely understand Australia's global position from within the nation and focus on the 'global outside' primarily as a source of external competitive pressures and other movements into the national space (e.g. Bradley, 2008). The notion that the global as 'us' has yet to take root in government circles in Canberra; though many university personnel have a more world-based view, and are preoccupied not simply with how Australian higher education and research should respond to the economic opportunities of the global environment, but also with what they should initiate and what Australia's distinctive global contribution might be.

For Australian higher education and its institutions, and Australia as a whole, the strategic issue that dwarfs all others is the Asia-Pacific. Australia is still ambivalent about its geography although it is moving closer to the region. There is still a persistent tendency to under-estimate the importance of Indonesia and the rest of Southeast Asia though because of proximity alone this is forever Australia's most important global site. The universities are well ahead of the nation as a whole in convergence with Asia but they share some of the limitations characteristic to Australia in this period. Lack of Asian language capacity within Australia remains a major handicap. The education system is responding only slowly to this capacity problem. Fortunately Australia's demography is much more plural and Asian than its public (and educational) culture appears. In the next generation the advance of bilingual Asian-Australians to greater prominence in the universities, the professions and the public culture will expand the strategic possibilities. A second issue yet to be dealt with successfully is the surprisingly persistent anti-intellectualism in Australia, one of the legacies of a provincialism protected by remoteness and sustaining an inferiority complex in relation to the metropolitan Anglo-American centres. It inhibits the universities. Yet they together with the public media are also keys to a solution.

A last difficulty facing Australian higher education, which it shares with many other systems, is that increasingly the role of research intensive universities is diverging from that of other higher education institutions; even though Australia national policy has so far failed to grasp the implications of this. It sometimes seems that all the excitement lies in the globally engaged part of the sector, and within the universities, with those themselves most globally engaged. Globalisation itself creates these binary global/local configurations within institutions and communities. This should be seen not simply as a problem of exclusion but as an opportunity to remake the local dimension of action. It is essential to develop new organisational blueprints for those institutions focused primarily on local vocational preparation and second chance literacy. These blueprints will necessarily be grounded primarily in a renovated teaching mission and in the educational empowerment of learners. Perhaps the one

strategic advantage created by the pervasive credentialism is that it creates a vacuum in the individual, moral and social purposes of education that is waiting to be filled.

15. General and summary 2: Respective role of government and institutions

- *What will be the role of government and public policy in bringing about such changes, as distinct from changes brought about by the higher education system itself? Please provide illustrations.*

15.1 Global overview

Increasingly, the new public management systems developed in the 1980s will find themselves itself out of step with the times. The larger trend of modern organisations is not to local control systems, but to unqualified devolution within a macro framework of common social order (Djelic and Sahlin, 2006; Drori, et al., 2006). In the longer term in universities, as elsewhere, a choice making and increasingly a creative designer individualism will become paramount (Peters, et al., 2009; Maginson, et al., 2009); albeit one embedded in complex networks and driven by universal logics. This is not a utopian reading of the trends The same social, economic and political problems will still be there, the ecological problems will be worse, and universities will be more burdened. As higher education systems evolve it is likely that elements such as quality assurance cultures, external accountability and audit mechanisms (section 8), and unmediated relations between institutions and stakeholders, will become more important. The micro management of products, performance and administration will fade. Greater diversity will develop, not just in missions but in organisational systems. States will find that in an environment of high transparency greater diversity is not a problem and offers more resources for the fulfilment of their purposes

For the reasons given in section 14.1 research universities will become increasingly disembedded from national systems of the present type. Governments will need to respect their autonomy in global matters if it wants them to be effective. Further, for public regulation to maximise its effectiveness it will need to ‘go with’ the universities out into the global space; that is, it will need to be able to imagine globally as well as imagine in terms of national boundaries and objects. The Singapore government has some of this (though perhaps not enough). Most of the creative and responsive changes in knowledge and the curriculum will be led by universities rather than national governments. This has long been the case in higher education in the US, where freedom and enterprise are as valuable as money. In Australia the Melbourne Model is one illustration of this shift in the locus of paradigm setting, from government to institutions. But national governments have an immense contribution to make to building the potentials of higher education institutions. Among their main roles is to facilitate the inward movement of talent, through the coordination of decisions on infrastructures, remuneration, organisational resources, precincts, immigration and citizenship; and then to keep enough of the globally mobile talent to create bonds of loyalty strong enough to build long term capacity. Offering an environment conducive

to creative people will provide institutions, cities and nations with an edge which becomes self reinforcing once the threshold is reached. Singapore is on the brink of achieving this. Nations without a large diaspora to draw on, or already positioned as sites of macro opportunity like the USA, must make it happen for themselves. In that respect the strategic problem facing Australia is similar to that of, say, Korea. Hong Kong located on the edge of China is a special case of the same set of dynamics.

This suggests that the first task of government will be to ensure that the universities are transparent; and exposed to global referencing, dealings and requirements; and that their leaders and governance are up to the mark. The second task will to work out how best to augment their capacity, in terms of both allocative efficiency and the effective delivery of results against goals. The third task will be to facilitate rather than inhibit the capacity of those universities for autonomous evolution. The third task will be to work out how to add value (and how to draw on global universities as effective resources for other local policy agendas and the nation's global forays). Turning back to the national higher education system, the temptation will be to respond to the loss of steerage in the research sector, with a redoubled supervision of the rest of higher education. That would be a mistake. The capacity for autonomous action needs to be fostered across the whole system.

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