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DIFFERENT ROADS TO A SHARED GOAL

Political and Cultural Variation in World-Class Universities

INTRODUCTION

In *The Challenge of Establishing World-Class Universities*, Jamil Salmi (2009) explores what nations and institutions need to do to create "globally competitive universities". He finds that these universities are characterized by a concentration of talent, abundant resources and favourable governance arrangements. In *The Road to Academic Excellence: The Making of World-Class Research Universities,* Phillip Altbach and Jamil Salmi (2011) provide a set of individual cases. In his concluding chapter Salmi expands on the necessary characteristics. He points to internationallization strategies as a means of accelerating development, and the importance of the broader "tertiary education ecosystem", in which would-be world-class universities are located. This includes the "macro-environment", covering the legal, political and economic setting; national leadership; the governance and regulatory framework, including institutional autonomy and accountability; financial resources and incentives; articulation and information mechanisms; geographic location; and digital and communications infrastructures (Salmi, 2011, pp. 336-337).

The argument and its supporting evidence are convincing, but there is one limitation, this being that the factors that condition the development of world-class universities are defined solely in generic terms. Moreover, the generic attributes and conditions of the world-class university that have been identified by Altbach and Salmi vary from country to country, and university to university. That is, practices of governance, resources, leadership and autonomy take many forms depending on national and local influences. In addition, as will be discussed, these many forms seem to clump together in regional groupings that share common cultural elements and these regional groupings are the "different roads to a shared goal" in the chapter title.

In sum, in the chapter there is reflection on the different roads that universities in different parts of the world are taking towards the common goal of the world-class university. It begins with discussion of the nature of a world-class university and of its operating conditions, with it being argued that it is better to understand the goal not in terms of ranking position (a norm-referenced definition), but rather in terms of objective features (a criterion-referenced definition). This is followed by exploration of the different roads to the world-class university. The term

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"different roads" is not used in the sense of Salmi's (2009, p. 39) "different pathways", meaning differing organizational strategies for making stronger institutions within a national system, such as upgrading, merger or the creation of new institutions. Rather, "different roads" refers to cultural-historical differences manifest in development strategy, especially variations in the role and character of government, in relations between nation-state and higher education institutions, and in the social practices of education. The chapter contends that there can be and are different roads to the world-class university governed by the cultural-historical traditions. This means that it is not essential to imitate all details of American or Western European evolution. This is encouraging and possibly liberating for emerging systems, although some national traditions can be obstacles to the goal. In the final part of the chapter there is illustration of the contention about different roads with reference to higher education and research in East Asia and Singapore. In this region the melding of Western influenced modernization with the distinctive East Asian state tradition and Post-Confucian educational practices, has led to a specific dynamic in relation to the development of higher education.

The research underlying this chapter is in two parts. First, since 2004 the author has carried out 21 individual case studies of national research universities, in 19 separate systems. This includes 16 research universities in East and South East Asia and the Western Pacific, plus three comparator universities in North America and two in Netherlands.[1] The research for these studies has included interviews with university presidents/vice-chancellors/rectors, deputy presidents, leading administrators with responsibilities for international activities, the deans in engineering and social science, and a group of professors from the latter two disciplines. The case studies have been focused on the global perspectives, strategies, links and activities of these universities, most of which are the leading research institutions in their nations. Particular attention has been given to synergies and also tensions between government and the universities in relation to global activities. The studies have unearthed much information on how the universities concerned, and the various governments are approaching the issues of global competition, rankings so as to build world-class universities. Second, the chapter also draws on the author's various contributions to theorization of the global higher education setting, including some conceptually-oriented studies with empirical mapping (Marginson & Rhoades, 2002; Marginson, 2006; Marginson, 2007; Marginson, 2008a; Marginson & Van der Wende, 2009a, 2009b; Marginson, Murphy & Peters, 2010; Murphy, Peters & Marginson, 2010; King, Marginson & Naidoo, 2011; Marginson, Kaur & Sawir, 2011).

WORLD-CLASS UNIVERSITIES

What is a World-Class University?

Case study research (e.g. Marginson, 2011a) and the relevant literature (Hazelkorn, 2008 & 2011) confirm that the drive towards world-class university status is widespread, with only a few emerging nations being untouched by this movement.

That is, the leading universities in most countries want to be world-class universities or take it for granted they have reached that level already, and governments almost everywhere want their leading institutions to be recognized on the global scale. Many emerging nations have set targets related to the achievement of world-class universities that are based on position in the global rankings. Such aspirations were not as widespread prior to the birth of global rankings at Shanghai Jiao Tong University in 2003. Nevertheless, rankings did not cause the world-class university movement, for this has been underpinned by growing global convergence and partial integration in world higher education; the economics of innovation and knowledge-intensive production; and the practices of "competition states" (Cerny, 1997) focused on building global capacity. Moreover, the need for information, mobility and effective action at the global level drives continuous observation and comparison on the basis of common global systems (Marginson, 2011c, 2011d) and this deepens the desire to match the stronger institutions.

All nations now need a developed higher education system with research capability; just as they need clean water, stable governance and a standardized financial system. They need universities that can "participate effectively in the global knowledge network on an equal basis with the top academic institutions in the world" (Altbach & Salmi, 2011, p. 1). Nations unable to interpret and understand research, a capacity that must rest on personnel themselves capable of creating research, find themselves in a position of continuing dependence. The fact that the achievement of one or more world-class universities depends on achieving a certain level of economic development (there are few world-class universities in countries with per capita incomes of less than US$15,000 per year, with China being the major exception) does not obviate the national need for such institutions in low-income countries. That is, even if the goal is not within reach in the next generation, a nation can progress towards it. For their part, all national universities want to connect globally and to cut a larger figure in the world, on the basis of self-determining strategies, while sustaining both institutional autonomy and government financial support.

But what is a "World-Class University"? Universities well placed in the rankings rarely use the term, for it is an aspirational term mainly used by emerging systems. Mostly, "world-class" is simply aligned with presence in the ranking, though there are varying opinions about where the boundary falls (top 50? top 100? top 500?). However, whilst rankings map global competition and help to drive improved performance, they do not provide an empirically verifiable material basis for identifying "world-class" institutions. This is because ranking systems are norm-referenced not criterion referenced. That is, a university's rank tells us where it stands in relation to other universities, but not where it stands in relation to objective measures of capacity or output. It is true that from the point of view of the university itself, rank is vitally important. That is, all research universities strive for prestige, because status (Podolny, 1993) matters more to them than money (Bourdieu, 1988; Frank & Cook, 1995; Hansmann, 1999; Brint, 2002; Geiger, 2004; Veder, 2007; Brown, 2011). However, from the point of view of government, what matters is the contribution that higher education makes to the

economy and society and that contribution is determined by objective capacity and performance. In other words, viewed from outside higher education competition, what matters is not the position in the university hierarchy as an end in itself, but the fundamental activities that sustain an institution's positions in the hierarchy. Under this perspective, what creates an institution's value to graduates, employers, nations and the world is not the level of its rank but the quality of its work.

While every nation needs research universities operating at global standard, it would be meaningless to say that every nation needs top 50 or top 100 universities, because by definition, this is impossible. There is not room for all nations to have a top 100 university and if capacity is sufficient, rank does not matter. If a quality ought to be universally distributed it makes no sense to define it solely in terms of zero-sum competition. In relation to this, an alternative to the norm-referenced world-class universities is the criterion-referenced notion of the "Global Research University" (Ma, 2008; Marginson, 2008b), which allows for the material elements underpinning the performance of institutions to be observed and measured. Moreover, there is no limit to the number of universities (and systems) that can acquire these qualities, for the tag "global research university" is not confined to the top 50 or 100 institutions.

What then is a global research university? Its qualities have been identified by Altbach and Salmi (2011; Salmi, 2009). It is a university embedded effectively in its local and national contexts on an ongoing basis, and one that also has an established a global role and presence. In addition, it is adequately resourced in revenues and human skills, and its systems of governance foster openness, initiative and the freedoms necessary to make strategic executive decisions in relation to developing new knowledge and interpretations across the range of disciplines. Moreover, it is partly internationalized and so aware of what is happening in other institutions. Further, it exhibits strong global connectivity in communications, collaboration, two-way flows of knowledge and ideas, and continuing flows of faculty and students moving in and out of the institution. Above all it has research capacity sufficient to generate globally significant output in the sciences and social sciences, thus enabling it to position itself in worldwide knowledge circuits and claim the reputation of a bona fide modern university.

The Role of Research

Research is the most important element, for several reasons. First, knowledge is the common currency, the medium of exchange through which universities deal and collaborate. That is, knowledge is a global public good in the economic sense (Stiglitz, 1999), which flows freely across borders and is used everywhere without losing value. Further, globalization has enhanced its universal character and intrinsic importance. Second, the creation, interpretation and codification of knowledge, as research, are the functions that distinguish universities from other educational institutions, and most other social organizations. Third, since the emergence of the Humboldt model of the teaching and research university in nineteenth century Germany, followed by its adaptation to the US, which began

at Johns Hopkins University, research has been increasingly central to the modern idea of a university (Kerr, 2001).

Fourth, research has become one of the indexes of global competition between nations, and many national governments pursue nation-building investments in research as a principal aspect of economic competitiveness. Zones of accelerated research include: mainland China (Li et al., 2008), Korea, Taiwan China and Singapore; parts of Europe including Germany and France; and the US, where the Obama administration doubled funding for the National Science Foundation and National Health Institute research programs in 2009. The centrality of research in nation building is grounded in the role of science and technology in military and economic competitiveness, which long predates the birth of the Internet. It goes back at least to the application of industrial innovations to military developments in the nineteenth century (Bayly, 2004). Perhaps the key moment in the positioning of research in global competition was the American use of nuclear weapons at the end of world war two. This technology rested on developments in the science of nuclear physics. Therefore, perhaps appropriately, the pattern of competitive investments in research and development is sometimes called the "arms race in innovation". Competition between nations in research is also described as a "war on talent" where national systems that are expanding their research capacity are better positioned to attract global doctoral students, post-doctoral and senior researchers as well as industry project monies. Further, as the competition between nations tends towards becoming a universal competition, global patterns are entrenched. This illustrates Bayly's point that in the modern era, nation building and globalization go hand in hand (Bayly, 2004). Hence, the university functions of knowledge creation, dissemination, storage and transmission, and research training, have spread from some nations to most nations, as indicated by the common global character of the world-class university movement.

Finally, research is the index of value in global competition between individual universities that is fostered and expressed in the rankings. As noted, competition between research-intensive universities is a status competition, i.e. status, ultimately, is derived from research performance (e.g. of many see Dill, 1997; Horta, 2009). In other words, research determines the value of each university "brand", even regulating the market in undergraduate education. Advanced research performance does not necessarily generate high quality teaching, but has an impact because students are focused on the "brand" value of degrees. That is, most students enrol in the university that has the highest status they can achieve, and this is determined by objective research performance, which cannot be fudged. Regarding this, if a university is not strong in research, marketing cannot make it look strong and thus it must have real, demonstrable capacity and output in terms of recognized indicators of research.

Conditions of a Global Research University

Salmi (2009) and research by the author (Marginson, 2011a) concur on the conditions necessary to establish and maintain a long-term global research

university. First, there are the enabling conditions external to such a university. Within a nation-state there must be a strong desire for the prestige and capacity that it can bring. In addition, the nation must have the economic capacity to finance such universities on a sustainable basis from a combination of public and private sources. Further, policies, regulatory frameworks and funding programs must be favourable to, and not unfavourable to, the evolution of a global research university. In relation to these matters, "Research universities must have adequate and sustained budgets; they cannot succeed on the basis of inadequate funding or severe budgetary fluctuations over time" (Altbach, 2011:25).

Second, there are the conditions internal to the global research university. Again, as with external conditions, there must be a strong desire to create and maintain such an institution. Moreover, there must be human resources and physical capacity adequate to support research, teaching, communications and institutional leadership and organization; including professionalized service delivery and executive leadership. There should be institutional autonomy sufficient to enable strategic decisions and initiatives, including global initiatives. Internal governance and organizational culture should sustain openness and continually improving performance. There must be global connective capacity, especially in communicating knowledge and managing two-way people flows. Further, resources for research should be allocated on a merit basis. Finally, there must be academic freedom sufficient to enable creative initiative and global connectedness across all disciplines.

The third condition is time, for it is impossible to become a sustainable global research university overnight. Perhaps the minimum time needed is 12 to 15 years, even if resources are excellent, initial leadership outstanding and good decisions are made without many errors. Regarding this, the Hong Kong University of Science and Technology (HKUST), founded in 1991, medium in size but already one of the strongest research universities in East Asia, fulfilled all of these conditions and took just over a decade to become established at the global level (Postiglione, 2011). In contrast, in spite of the last decade of stellar investments in Saudi Arabia, especially in the newly established King Abdullah University of Science and Technology, that nation has yet to achieve a substantial lift in the nation's publications performance, as measured by the National Science Foundation (National Science Foundation [NSF], 2012). Saudi Arabia will take longer than Hong Kong.

DIFFERENT ROADS TO THE WORLD-CLASS UNIVERSITY

The research science system is a global one, articulated as a single set of English-language publications that provide the most authoritative, though not the only, knowledge in those disciplines. Knowledge in the humanities, the professional disciplines and parts of the social sciences are more nationally bound than the science-based fields, which set the norms of the global research university. This implies that the world-class university to which all aspire has a sizeable element of

universality that permits it to be considered in generic terms at the global level, as has been the case so far in this chapter.

However, to follow this line of thought exclusively would be to suggest there is only one kind of modernity, and only one method for modernizing a higher education system. That is, it would suggest there is only one kind of state project in higher education and only one possible framing of the world-class university. However, as noted in the introduction, the world-class university is situated in national and local contexts that vary considerably. This variation includes differences in the non-sciences and in organizational systems and cultures; and in the larger setting, in social approaches to higher education and knowledge, in the nature and role of government, in practices of freedom, and in relations between society, state and higher education. In other words, the generic conditions for building the global research university can vary quite markedly in content. For example, as Altbach and Salmi (2011, p. 3) note, the world-class university needs a high concentration of talented academics and students, significant budgets, and strategic vision and leadership, yet some world-class budgets are largely state financed, whereas in other cases tuition fees for the student are high. This is because the political economy of cost sharing is highly variant, reflecting differences in political cultures, including differing conceptions of the balance of responsibility between state, institutions and families. In some cases the necessary strategic vision and leadership is expressed at institutional level, and universities are much more global in outlook than their governments, whereas in other cases government is key or even decisive. However, sometimes both state and university think globally in the same way, as in Singapore.

In short, there are different roads to the same goal, which is the world-class university. Up to now American approaches to system-building and institution-building have dominated much of the thinking about world-class universities. This is not surprising given that the US houses half of the top 100 research universities and produces half of the top 1% most cited research papers (Shanghai Jiao Tong University [SJTU], 2012; NSF, 2012), and the fact that forms typical of Anglo-American higher education have been absorbed into the design of ranking systems. However, future thinking about world-class universities will be more plural, given that other models are emerging, especially in East Asia. Already, in reality, regardless of the norms of policy thinking and ranking systems, the different world-class universities are by no means the same as each other. That is, no one should perpetuate the illusion that all nations and institutions are operating on the same basis, any more than it should be assumed that they are operating on an equal basis. As Wang Hui puts it in *The End of the Revolution: China and the Limits of Modernity*:

> For 300 years, all of humanity has certainly become more closely linked to one another through colonialism, unequal trade and technological development. Yet a common path hardly exists between the colonizer and the colonized, between Africa and the US, or between China and the European powers. (2009, p. 85)

Neo-institutional theory suggests that key to understanding the variations between higher education systems, is variation in nation-state forms and strategies. That is, different state forms and political cultures shape the distinctive roads to the world-class university. Arguably these roads are also shaped by different educational cultures (Marginson, in preparation). Moreover, it is noticeable that the different roads (and systems) of higher education tend to be not so much national, as regional or sub-regional, reflecting historical overlaps and clustered cultures. As Tu We-Ming remarks in *Confucian traditions in East Asian modernity* (1996): "Culture matters … economic facts and political institutions are laden with cultural values" (pp. 4–5).

It is hypothesized that these different roads to the world-class university can be found to be distinctive to the higher education systems in the US; the Westminster systems (UK, Australia, New Zealand); the Post-Confucian forms of East Asia and Singapore (Marginson, 2011b); the Nordic systems (Valimaa, 2011); the Central European or Germanic systems; the Francophone systems and in Saudi Arabia and the Gulf States. There might also be other roads: for example a Latin American variant (a "Bolivarian Model"?) partly shaped by the Bonapartist model in France and Italy; emerging approaches in higher education systems in South Asia and Central Asia, etc.

Comparison of the Different Roads to the World-Class University

If so each of these differing roads to the world-class university needs closer definition, research observation and analysis, so they can be more effectively compared with each other. Regarding the latter point, some roads may be shown to be more effective than others in reaching the common goal of the world-class university. That is, different paths may have varying strengths and weaknesses.

Space does not allow a full investigation and discussion of the different roads in this chapter. This is a project for a future time, but comparison could focus on:

- the character and role of the nation-state;
- the prevailing political culture;
- educational practices in the family and in society;
- modes of governance, leadership, management and organization in higher education;
- relations between the state, higher education institution and society;
- financing and cost sharing in higher education;
- the degree and type of global openness, engagement and initiative, including the contribution to the global architecture in higher education.

The remainder of this chapter focuses on one road to the world-class university that is of considerable interest at present, and is clearly different to that of the Anglo-American universities that dominate in the literature, namely, the trajectory of Post-Confucian higher education. Table 3 at the end of the chapter compares the Post-Confucian higher education systems to the US and Westminster systems.

THE POST-CONFUCIAN MODEL

The Post-Confucian systems are those of mainland China, Hong Kong SAR, Macau SAR, Taiwan China, South Korea, Japan, Vietnam and Singapore. These systems are quite different in many ways, in particular, with regards to language and political cultures, and there are political tensions between these countries. Nevertheless, they share common traditions in relation to the state and education, elements that are determining of the distinctive features of Post-Confucian higher education.[2] For the most part their systems also share a common economic position, with all except mainland China and Vietnam having achieved Western European levels of wealth. However, mainland China has doubled its average income in the last five years, and education-strong Shanghai, Beijing and Eastern China are much wealthier than most of the country. Table 1 provides data on gross national income (GNI) per capita for the focal countries.

Table 1. Gross national income per head in the Post-Confucian nations/systems (2010)

Nation/system	*GNI PPP* per capita* （US$）
Singapore	55,790
Hong Kong SAR	47,480
Macau SAR (2009)	45,220
Taiwan	35,700
Japan	34,460
South Korea	29,010
Mainland China	7640
Vietnam	3070
India**	3550

* PPP: Purchasing Power Parity.
** India, not a Post-Confucian nation, is included for comparison purposes.

Source: The World Bank (2012b); CIA, (2012)

On the basis of this economic platform, participation is expanding towards universal levels, institutional quality is rising, the number of research papers is growing very rapidly, and world-class universities have emerged. However, within the group there are two exceptions to this pattern of dynamic growth. One is Japan, which developed a high quality system of higher education and university research thirty years earlier and now seems to be marking time. The other is Vietnam, which is growing in terms of student numbers from a low base, but as yet is too under-developed in terms of economic capacity to achieve the Post-Confucian take-off in research and establish world-class universities or global research universities.

Features of the Model

The Post-Confucian systems have developed within the framework of the comprehensive East Asian nation-state that originated under the Qin and Han dynasties in China. In this tradition there is none of the anti-government political culture typical of the US, for in the Post-Confucian world, politics and government are in command, not the markets (Gernet, 1996). There is some variation within the group. The state domination of the economy and society is open in the one-party states of Singapore and mainland China, whereas, it is expressed more indirectly via the bureaucracy where there are contestable polities, in places such as: Korea, Japan and Taiwan. Nevertheless, although in the latter systems political leadership may change, there is continuity in government itself and, what is more, work in government enjoys high social prestige. For example, in Post-Confucian systems many bright graduates opt for careers in the senior levels of government rather than in business or the medical or legal professions that attract most elite graduates in the English-speaking countries.

The Post-Confucian systems also rest on the Confucian tradition in education, which first flowered on a broad basis in the Song dynasty in China. The core of this tradition is family-based commitment to self-cultivation via learning, together with the use of universal systems of examinations as a method of social selection, first developed for the meritocratic selection of state officials under the Han dynasty. In the home, education is automatically understood as part of the duty of the child to the parent and the duty of the parent to the child. At the societal level, the high stakes character of the examination, which mediates status competition, underpins the value placed on education. Further, in Post-Confucian countries and regions the respect for education is long-standing and more deeply rooted than in Europe and North America. At the same time, the evolution of East Asian higher education has also been powerfully influenced by Western education, especially the US research university. Regarding this, "catch-up" with the West has been a major driver of East Asian policy since the Meiji period in Japan and templates grounded in new public management that originated in the UK have shaped reform in East Asia as they have everywhere else. Moreover, the original Confucian focus on moral self-cultivation has been economized, with the main focus now appearing to be on the utility of higher education for individuals and for the economy. Consequently, there are concerns in mainland China (as in the West) that the university is losing its soul. Often this is seen as a function of Westernization, but the problem is more complex than that, as explained next.

It is a mistake to see Western modernization as displacing educational tradition in East Asia, for the relation between tradition and modernity is one of exchange, not of displacement. That is, Post-Confucian universities, like their societies, are hybrids of East and West and as such they are creating something new: a distinctive modernization in education and research. What are the distinctive conditions and attributes of the Post-Confucian model of higher education? Four have been identified so far in this discussion: the

comprehensive Sinic nation-state; the practices in the family associated with Confucian self-cultivation via education; the neo-Confucian institutional forms, such as the examination; and economic growth as a platform for educational evolution. There are four other elements. First, the roll-out of tertiary education participation rates to near universal levels, partly financed by households. Second, sustained, deep and distinctive practices of internationalization, which take bi-cultural forms and third, the spectacular growth of research and development activity. The second and third elements provide the principal condition for the fourth aspect, an advancing role on the global scale. Each of these elements is now examined in turn.

Participation and Student Achievement

Typically, the Post-Confucian systems have been making progress rapidly in both the quantity and quality of schooling and higher education and they seem to have avoided the trade-off between advances in quality and quantity that are endemic to Anglo-American systems. They also seem to have avoided a trade-off between public and private financing. Typically both government and households are sharing the cost of expanding participation. As the tertiary system matures, the proportion of tuition paid for by the household rises and the state focuses an increasing part of its funding on the academically elite national research universities and their students as well as on social equity objectives.

Tertiary participation exceeds 85% in both South Korea and Taiwan. In mainland China, participation was less than 5% in 1990, whereas it is now approaching 30% and the target for 2020 is 40%, which would bring China close to the Organization for Economic Cooperation and Development (OECD) countries' average. The standard of institutions varies, with some arguing that graduates are inadequately prepared for a fast developing manufacturing sector. A recent World Bank report refers to a combination of "low-skill glut and high-skill shortage" in graduate labour markets (The World Bank, 2012a, 194). However, the government's 211 and 985 programs have singled out the leading universities for evolution at a higher level of quality and global competitiveness and the bulk of globally significant research is concentrated in those institutions. In only six years, the number of mainland Chinese institutions in the Academic Ranking for World Universities (ARWU) top 500 has almost tripled, from eight to 23 (SJTU, 2012). Currently, the main challenge is to improve the standards of the rest of the institutions and to spread participation into more families in the countryside.

As pointed out above, tertiary participation in all Post-Confucian nations is partly funded by households. Moreover, even very poor families often invest heavily in the costs of schooling and extra tutoring and classes outside formal school. Many families spend as much on education as American families spend on housing. In Korea, where the trend towards household funding has gone furthest, 77.7% of all costs of tertiary education institutions are paid by the private sector, including 52.1% by households, and just 22.3% by the government. In Japan the private sector share is 66.7% (OECD, 2011:244). In addition, the drive to invest

privately in children's education is manifest also in the remarkable level of investment in extra schooling in its different forms, with Levin (2011) estimating that in Korea this probably exceeds 3% of gross domestic product (GDP).

No doubt the investment in extra learning is integral to the levels of student achievement, for the results of the 2009 OECD Programme for International Student Assessment (PISA) survey suggest that East Asia and Singapore constitute the world's strongest zone for student learning (OECD, 2010). For example, in mean student scores in mathematics, the top five systems in the world are all Post-Confucian: Shanghai (600), Singapore (562), Hong Kong SAR (555), South Korea (546) and Taiwan (543). Japan is in ninth place with 529. East Asia and Singapore's systems perform almost as well in science, having five of the top six systems, including Japan (in fifth place) and for reading, with four of the top five systems. This constitutes a strong starting point for tertiary education and graduate literacy.

Internationalization

Salmi (2011) notes that internationalization is central to those Post-Confucian universities that aspire to world-class university status.

> Both Shanghai Jiao Tong University (China) and Pohang University of Science and Technology (the Republic of Korea) made a strategic decision to rely principally on Chinese or Korean academics trained in the best universities in North America or Europe and, to a large extent, to recruit highly qualified foreign faculty. Significantly increasing the percentage of courses taught in English is an integral part of this strategy, as well. (Salmi, 2011:326)

Other internationalization strategies include a strong emphasis on global publishing and the widespread use of cross-national benchmarking. Universities in Korea, Japan, Taiwan and China have especially focused on American examples, but all Post-Confucian systems also follow what is happening in Western Europe, thus demonstrating their embracing the notion of there being a plurality of good practice. Moreover, all Post-Confucian systems send some personnel abroad for doctoral training. In addition, there is growing openness to foreign faculty and students, although Japan and Korea have been slower to accept this than the other systems. At the forefront of these developments, Singapore has brought branches of leading foreign universities onto the island.

Research and Global Role

East Asia and Singapore are emerging as the world's third great zone of research, development and innovation, after the US and Canada, and North Western Europe and the UK. Japan, long having been a world leader in science, has now been joined by Korea, Taiwan, Singapore, the Hong Kong SAR and of course, mainland China. Moreover, East, Southeast and South Asia, together spend almost as much

on research and development (R&D) as the US and most of East Asia and Singapore sustain rates of investment in R&D, especially business R&D, at European levels. Regarding this, in 2009, Korea spent 3.4% of GDP on R&D, Japan, 3.3%, Taiwan, 2.9% and Singapore, a slightly lower level of 2.4%. Mainland China, where R&D investment was at 1.7% of GDP, now spends about 40% of the American budget on R&D and is increasing spending at the extraordinary rate of 20% a year (NSF, 2012). The national target is 2.5% of GDP by 2020, which would bring China to the level of investment in the US, if China's GDP exceeds the American GDP as expected. As in Korea, a relatively low proportion of mainland China's research budget goes to universities, about one-tenth, but university resources for research are expanding along with all other R&D. In fact, policy in these two countries places strong emphasis on R&D for industry. This strategy appears to be working: between 1995 and 2008, the US share of worldwide high technology exports dropped from 21 to 14%, whilst China's share rose from 6 to 20% (NSF, 2010).

Increased investment leads to greater output. In 2009, China, Japan, South Korea, Taiwan and Singapore, between them, produced a total number of science papers equal to 80% of the US output. In fact, mainland China, which was only the 12th largest producer of science papers in 1995, is now the second largest in the world, having passed Japan in 2007. There has also been an exceptionally rapid growth of outputs in each of: Korea, Taiwan and Singapore, but there has been little recent change in Japan (NSF, 2012). However, the growth in research funding and output has yet fully to show itself in citation performance and in the ARWU ranking. That is, apart from the first five universities from Japan (Tokyo, Kyoto, Osaka, Nagoya and Tohoku), there are no East Asian or Singaporean institutions in the top 100 and only five non-Japanese universities in the top 200, these being: the National University of Singapore, Seoul National in Korea, the National Taiwan University, Tsinghua, and the Chinese University of Hong Kong (SJTU, 2012). However, there is a lag before publications show up in citations numbers and a further lag before cites reach the Shanghai Jiao Tong index and so these figures may be out of date. Moreover, the weight given to Nobel Prizes (30%) also disadvantages East Asia.

The comparative performance of East Asian systems can also be monitored using the Leiden Ranking (Centre for Science and Technology Studies Leiden University [CWTS], 2012) which works with Thomson Web of Science (2012) data3. The Leiden data set can be used to identify the number of universities that published over 5000 papers in the years 2005-2009 that also had more than 10% of their papers in the top 10% in the field, thereby combining a quantity measure with a quality measure. Under this approach the performance of East Asian universities is more impressive in relation to volume than in relation to citation levels.

As Table 2 shows, in terms of paper volume there were 19 Post-Confucian universities in the world top 100 universities, led by Tokyo. Citation is dominated by US universities, with 64 of them having published both 5000 papers and having at least 10% of their publications in the top 10%. Moreover, there were 47 such universities in Europe, concentrated in the northwest, but

just 12 from East Asia and Singapore, these being: Tokyo University in Japan, National University and Nanyang in Singapore, Korea Advanced Institute of Science and Technology in Korea, Hong Kong University and the Chinese University in Hong Kong, and six in mainland China: Tsinghua, Peking, Fudan, the Science and Technology, Nanjing and Jilin universities. However, another 20 Asia Pacific universities had published more than 5000 papers but had less than 10% in the top group (CWTS, 2012). As quality lifts citation rates in East Asia will surely follow and the region will start to look more like Europe.

Table 2. World top 100 universities in East Asia and Singapore by volume of scientific papers (2005-2009)

Institution	*Volume of science papers 2005-2009*	*World rank on paper volume*	*Proportion of papers in top 10% most cited in field* (%)
The University of Tokyo (Japan)	18,382	4	10.2
Kyoto University (Japan)	14,941	11	9.5
Seoul National University (South Korea)	13,052	19	8.9
Zhejiang University (mainland China)	13,037	20	9.1
Osaka University (Japan)	12,266	25	8.1
National University of Singapore (Singapore)	11,838	29	13.8
Tohoku University (Japan)	11,736	30	7.9
Tsinghua University (mainland China)	11,478	34	10.8
National Taiwan University (Taiwan)	11,302	35	8.9
Shanghai Jiao Tong University (mainland China)	10,683	40	8.2
Peking University (mainland China)	9153	53	10.4
Kyushu University (Japan)	8462	62	6.8
Hokkaido University (Japan)	8043	71	6.1
Yonsei University (South Korea)	7399	79	7.8
Nagoya University (Japan)	7203	87	8.1
Nanyang Technological University (Singapore)	7136	90	11.9
National Cheng Kung University (Taiwan)	7126	92	8.5
Fudan University (mainland China)	7061	94	11.1
Tokyo Institute Technology University (Japan)	6932	99	8.3

Source: CWTS (2012)

The National University of Singapore stands out. It is sixth in Asia on the number of papers and regarding the proportion of papers in the top 10% in the field, it is first in Asia among institutions with more than 4000 papers and 82nd in the world. Japan's universities perform much better on the size criterion than the quality criterion. Moreover, flagship system leaders, such as the National Taiwan University and Seoul National University, fall below the 10% mark for high quality papers. However, most East Asian systems have developed medium sized specialist science and technology universities with good citation rates, such as Pohang and KAIST in Korea, the Hong Kong University of Science and Technology, which at 14.9% it is ranked 58th in the world on the Leiden top

10% citations measure, and several universities in China, including Nankai and the University of Science and Technology (CWTS, 2012).

Mainland China's performance on comparative research quality is uneven. For example, in 2010 China's researchers wrote just 3.6% of the top 1% most cited papers in all fields, as compared with a figure of 48.9% in the US. However, paper volume and quality vary greatly by discipline, with there being some fields in which China is already a world leader in terms of quality. For example, in engineering, chemistry, computer science and mathematics, China's share of world papers is close to double its overall share of all science papers and its share of the world's top 1% of papers in these disciplines is high. In engineering China has 12.3% of the world's most highly cited work, already one third the level of the US and more than twice that of Japan. Further comparisons with the US reveal chemistry citations stand at 30% of the American level and these figures are 25% for computer science and 20% for mathematics (NSF, 2012), which shows a strong base for future development. On the other hand, in medicine and the biological sciences the picture is completely different, with China having less than 1% of the world's top 1% of papers. By comparison, the US has more than half of the world's top 1% of papers in each of these fields (NSF, 2012). However, the most striking feature is the rate of change in China, for in 2000 it had 0.6% of the top 1% most cited papers in Chemistry and yet ten years later its share had jumped to 10.6%. Moreover, the proportion of its papers that are at the top 1% level is moving towards the average level for all countries (NSF, 2012). In fact, despite the language barrier, much of the science in China is improving at a very rapid rate.

The jury is still out on whether the freewheeling liberal American culture in both universities and civil society provides the US with a decisive advantage in producing research of the highest quality. This freedom is perhaps more apparent in American civil society than the universities, which are weighed down by performance regimes and the mimetic effects of competition for the middle position in disciplinary fields. In China there is open and feisty discussion within the party, government and universities, about many policy issues. In addition, with some exceptions, the atmosphere in the leading universities seems to be as liberal as in most parts of the world, and there is more engagement in policy issues than in many national systems. On the other hand, discussion in civil society and on the Internet is more restricted than in the US and most of Western Europe, which could slow the progress of improvement in higher education, and progress in the application of discoveries in higher education to society and industry.

The question of dual leadership in the universities, where the party secretary sits alongside the president, is ambiguous. On the one hand it can be seen as continuous interference in academic judgment. On the other hand it can be seen as a form of distributed leadership that buffers the direct role of the party-state, and therefore assists universities to secure partial university autonomy, as for example in Min Weifang's tenure as Party Secretary at Peking University (Hayhoe et al.,

2011, pp. 111–114). Again, the jury is out. The larger concern is government control of senior appointments.

> The president is usually appointed by the government or is elected by the academic community and subsequently approved by authorities. The appointment system might prevent the university from selecting the most suitable leaders for its development. (Wang, Wang & Liu, 2011, pp. 42–43)

What is clear is that mainland China's government wants research universities that are creative and globally effective. In that respect government and university leaders agree, and they both agree that creativity can be partly engineered from above, although they may disagree about who should do this, and both might be at variance with practicing researchers and scholars. These tensions are common to all higher education systems. What is distinctive about the East Asian systems is the state is a larger factor than in the English-speaking countries and much of Europe. The strong East Asian state provides advantages in world-class university development, especially its marvellous capacity to focus resources, to drive performance on the basis of planned targets that are real targets, and to move continually forward. On the other hand the state may limit what can be achieved, in that it often inhibits peer judgments in research, or retards the flow of knowledge through society and the innovation spaces in the economy.

At the same time, in this discussion it is important to recognize that in East Asia meanings of "public", "private" and "autonomy" are not the same as in the US or Europe. That is, human freedoms have both a universal component and a nationally and culturally specific one and this reality pertains to the research university itself.

> Once one can excel in terms of productivity and meet the State's criteria for producing valuable and useful knowledge, one may enjoy a high level of intellectual authority. This type of intellectual authority is not identical with academic freedom in the Western context, but in some ways it provides even more flexibility and greater power than does academic freedom. There is certainly some overlap between these two concepts, yet clearly a different emphasis. Westerners focus on restrictions to freedom of choice, whereas Chinese scholars looking at the same situation focus on the responsibility of the person in authority to use their power wisely in the collective interest. (Zha, 2011, p. 464)

> The term "academic freedom", which is used to denote a kind of freedom particularly appropriate to the university in the Western context … is not a good fit for China. On the one hand, Chinese scholars enjoy a greater degree of "intellectual authority" than is common in the West, due to the history of the civil service examinations and the close links contemporary universities have with major state projects. On the other hand, there is a strong tradition of "intellectual freedom" in China, which is rooted in an epistemology quite different from that of European rationalism. It requires

Table 3. Comparison of Post-Confucian and English language country systems

	Post-Confucian systems (East Asia & Singapore)	*United States' system*	*Westminster systems (UK, Australia, NZ)*
Character of nation-state	Comprehensive, central, delegates to provinces. Politics in command of economy and civil society. State draws best graduates	Limited, division of powers, separate from civil society and economy. Anti-statism common. Federal	Limited, division of powers, separate from civil society and economy. Some anti-statism. Unitary
Educational culture	Confucian commitment to self-cultivation via learning. Education as filial duty and producer of status via exam competition (and producer of global competitiveness)	Twentieth century meritocratic and competitive ideology. Education common road to wealth/status, within advancing prosperity	Post 1945 ideology of state guaranteed equal opportunity through education as path to wealth and status, open to all in society
State role in higher education	Big, state supervises, shapes, drives and selectively funds institutions. Over time increased delegation to part-controlled presidents	Smaller, from distance. Fosters market ranking via research, student loans then steps back. Autonomous presidents	From a distance. Shape system through policy, regulation, funding and supervising the market. Autonomous vice-chancellors
Financing of higher education	State financed infrastructure, part of tuition (especially early in model), scholarships, merit aid. Household funds much tuition and private tutoring, even poor families	State funds some infrastructure, tuition subsidies, student loans. Households vary from high tuition to low, poor families state dependent	Less state financed infrastructure now. Tuition loans, some aid. Growing household investment, but less than East Asia. Austerity
Dynamics of research	Part household funding of tuition, ideology of world-class universities, university hierarchy: together enable rapid state investment in research at scale. Applied research has dominant. state intervention.	Research heavily funded by federal government unburdened by tuition. Some industry and civic/ philanthropic money. Basic science plus commercial IP	Research funded (more in UK) by government, also finances tuition. Less philanthropy and civic money than US. Basic science, applied growth, dreams of IP
Hierarchy and social selection	Steep university hierarchy. "One-chance" universal competition with selection into prestige institutions. World-class universities are fast track for life	Steep institutional hierarchy mediated by SAAT scores. Some part second chances, mainly public sector. Top world-class universities are fast track for life	Competition for place in university hierarchy mediated by school results with some part second chances. World-class universities provide strong start
Fostering of World-Class Universities	Part of tradition, universal target of family aspirations. Support for building of world-class universities by funding and regulation. Emerging global agenda	Entrenched hierarchy of Ivy League and flagship state universities, via research grants, tuition hikes, philanthropy. Source of global pride	Ambivalence in national temperament and government policy on status of top institutions. Private and public funding has hit ceilings

> that knowledge be demonstrated first and foremost through action for the public good, also that knowledge be seen as holistic and inter-connected, rather than organized into narrowly defined separate disciplines. (Hayhoe, 2011, p. 17)

This is another fruitful area for future comparative research.

CONCLUSION

The East Asian dynamism underlines the importance of states and educational cultures in explaining world-class university formation. Table 3 compares the differing approaches to system organization and educational and political culture in the US, the Westminster countries (the UK, Australia and New Zealand) and the Post-Confucian systems.

In the English-speaking countries the state is John Locke's limited liberal state, demarcated between state, judiciary, market and civil society, and subject to continual questioning of the legitimacy of government. For example, in the US many believe the state should be neutral in relation to differing conceptions of the good life. In East Asia the state is different. It is seen as proper for the state to focus on particular notions of the good life, even in Hong Kong where the political culture comes closest to those of the English-speaking world. In the Post-Confucian systems it is taken for granted that the state is central to society and its ordering. In fact, it is impossible to imagine Post-Confucian higher education and research (or society) in the absence of the state, for without its driving intervention there would have been no take-offs in higher education.

At the same time, without Confucian learning at home, as passed from generation to generation, state policies would have had less purchase. In contrast, in this respect – ironically given their adherence to the Adam Smith limited state – the English-speaking nations and Western Europe are more state dependant. This is because the family motivation for education is not as universal as in East Asia and Singapore. Post-Confucian higher education can only be understood by recognizing the *interrelationship* between state political culture and family educational culture. This relationship is very positive for educational development. Because Post-Confucian households are willing to fund a significant part of tertiary costs, and the family and social competition together drive increasing participation in tertiary education, this frees up state resources to concentrate investments on infrastructures, globally-focused research universities, the research budget and the most talented students and researchers. On the basis of this social division of labour, unique in the higher education world, Post-Confucian countries and regions have been able to move forward at one and the same time, and at a rapid rate, on the quantity of participation, the quality of institutions, and the volume and quality of research, establishing a layer of world-class universities with varied missions.

So far, there has been no other road to the world-class university as time-effective as this and it is contended that the Post-Confucian model will be increasingly influential in future years. For example, it is possible that although

non-Confucian nations do not possess the same cultural and political conditions, they may pursue a new road to obtaining world-class universities by combining features of the Post-Confucian and US models.

NOTES

[1] The universities concerned are Universitas Indonesia, the Australian National University, University of Tokyo in Japan, Universidad Nacional Autonoma de Mexico, University of Toronto in Canada, University of Auckland in New Zealand, Chulalongkorn University in Thailand, the University of Twente in the Netherlands, Leiden University in the Netherlands, University of Malaya in Malaysia, the National University of Singapore, University of Illinois (Urbana-Champaign) in the US, Vietnam National University in Hanoi, Peking University in China, Shanghai Jiao Tong University in China, Royal University of Phnom Penh in Cambodia, National University of Laos; the University of the Philippines, Diliman; the University of Hong Kong, SAR China; Seoul National University in South Korea; and the National Taiwan University.

[2] In this group of countries there is a closer convergence in education than in society as a whole.

[3] Leiden provides separate indicators of each of paper quantity, and the proportion of papers in the top 10% most highly cited in their field, a quality indicator. The world gold standard on quality is Massachusetts Institute of Technology, which has 25.2% of its papers in the top 10% by cite rate.

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