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Globalization, national development and university rankings

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Introduction

It is a great honour to be invited to speak at the nation's premier educational institution, Vietnam National University in Hanoi, about national development, globalization, university rankings and the future of universities in Vietnam. Though this is my first visit to Vietnam in a sense I feel that I am coming home. My first public action in the city of Melbourne, as an 18 year old university student, was to join the opposition to the US and Australian military presence in Indo-China. When in 1975 you finally won the freedom and the unification of Vietnam, we were deeply touched by your determination, solidarity and bravery. As Bac Ho said, 'nothing is more precious than independence and freedom'. We respected you. We identified with your struggle. But we did not give enough attention to the suffering and loss that you endured, in winning your independence and freedom. The devastation of the long war has slowed the evolution of education and research in Vietnam.

But in a rapid globalizing world, the challenges facing government, and also university leaders and research professors, do not stop. Now it is the age of the knowledge economy. The independence and freedom of the nation will be safeguarded less by force of arms, and more by schools and universities and research; and by the cross-border patterns of competition and cooperation in the global knowledge economy.

And governments and universities everywhere are focusing on university rankings, as was shown by Ellen Hazelkorn's study for the OECD.¹ Decisions being made now, for better or worse, will set the patterns of educational development. What an important conversation we are having today, and how quickly things change! Six years ago in 2002 there were no global university rankings, though there were some national rankings such as *US News and World Report*.² Six years ago global comparisons of research publications and citations performance were left to the specialists in research policy and management. Classifications of institutions were practiced by the Carnegie Commission in the USA but there was no general movement. There were no global comparisons of learning outcomes. Consider the situation now. There are two major global rankings of universities each year, much publicized and influential. There is wide international interest in the metrics of research performance. European universities are developing a continent-wide system for classifying institutions, to match the classifications used in North America and China. The OECD is developing international comparisons of the learning outcomes of higher education. Only higher education in the United States, focused almost exclusively on the national market, seems to be untouched by global comparisons.

My paper will begin with a relatively brief discussion of globalization, the knowledge economy and higher education.³ 'Relatively brief' given the size of the topic. The paper will talk about the growing diversity of the knowledge economy, especially the new Asian science powers, led by China; and will reflect on the emergence of global comparisons and university rankings as a central motif of higher education. Then

¹ Hazelkorn, 2008.

² US News and World Report (USNWR), 2008.

³ For further analysis see Marginson & van der Wende, 2007; Marginson, 2008a.

follow some remarks on national development and the case of Vietnam. The final part of the paper considers more specific policy issues. One policy objective in Vietnam is to achieve at least one university in the world's top 200 by 2020. The meaning of this differs by ranking system. In reflecting on what the top 200 objective means under the Shanghai Jiao Tong University ranking, the Times Higher ranking, and Webometrics, the paper will comment on each of these as global standards. It considers what would be required to achieve the standards in Vietnam; and discusses the relationships between research universities and the rest of higher education, and between global rankings, national classification systems, and national rankings.

Globalization and the knowledge economy

What do I mean by globalization? Globalization is about the convergence and partial integration of the different parts of the world and of its nations, institutions and people. Political scientist David Held calls it 'the widening, deepening and speeding up of interconnectedness on a worldwide scale'.⁴ This is characterized by growing global flows across national borders, flows of people; flows of messages, ideas, knowledge and images; flows of goods, money, labour and production itself; flows of technology; flows of policies. In many areas such as education, governments tend to imitate each other more than they did. These global flows are the *symptoms* of globalization.

We can also talk about global systems - the global trading system; the financial system; the communications system; the system of air transport; the research and knowledge system, based on published English language science; even the international legal system and to a limited extent, the system of global governance. These global systems are the *mediums* and the *products* of globalization.

But what *causes* global convergence? Global convergence is both economic and cultural. The Internet sustains a global system of communications and data transfer, a single worldwide 'library' of information, which is a staggering change, and brings cultures into closer contact with each other. The Internet has been the most important element in conditioning globalization during the last 15 years, followed by the cheapening of air travel. The Internet secures much of its unifying and universal character from the role of the English language, which is even more dominant in communications, and in research and knowledge, than it is in global business. Communications sustain financial transfers, and enlarge the frame of production and exchange. In turn economic markets power the roll-out of communications and cross-cultural products. Both cultural and economic integration intensify inter-governmental relations, and encourage the parallel evolution between nations, of management systems and organizational and professional cultures. Increasingly, governments are concerned with positioning themselves in the worldwide setting and compare their nation and its key sectors with those of other nations on a routine basis.

Political theorists talk about the evolution of the nation-state into the 'global competition state'. But it is still a nation-state. National distinctions remain fundamental to human identity; though some national cultures run deeper than others.

⁴ Held, et al., 1999.

Globalization changes the setting in which governments and universities work, and alters their agendas and tasks, but does not displace the nation. Rather, it adds another dimension, the global dimension, alongside the national and local dimensions. There always was an international dimension to the work of governments and universities but it was mostly on the margins of day to day activity. The global dimension is now more important, more present than it was; and the three dimensions are now more likely to overlap with each other. Thus research universities are subject to *global* rankings, their performance is a matter of *national* policy, and it affects their *local* prestige and their internal organization. Research universities need to be active and effective in all three dimensions at once and to manage the intersections between them. They have become 'glo-na-cal' institutions: global, national, local.⁵

Research universities around the world are at the core of the global knowledge economy which has developed in the wake of globalization. In the last 15 years the knowledge economy has moved from futurist rhetoric to practical fact. There are a number of signs of this. The role of knowledge-intensive production and of cultural goods is growing. Around the world, knowledge workers are increasing as a proportion of the labour force. In government policy in many nations, research, knowledge and trained knowledge workers are seen as key to national capacity in *innovation*, the capacity to respond to changes in the global economy, access global science and technology and develop new industries.⁶ Innovation, knowledge, fostering creative work and attracting foreign talent are seen as key to a nation's global competitiveness. In some nations research expenditures are growing sharply. Rates of participation in tertiary education are increasingly rapidly in many if not most countries. An international 'arms race' in innovation is developing.

Knowledge in the global knowledge economy has two elements.⁷ The smaller is commercial intellectual property, prototypes for saleable products. The larger element is freely accessible public knowledge goods: the science, technology and social science accessed through the research system and the conversations on the Internet. This kind of knowledge, open source knowledge, is free or available at modest cost, but requires intellectual training and resources to be fully utilized. In practice only the nations with developed research systems can make effective use of it.

The USA is the leading global power in knowledge and in higher education.⁸ It is overwhelmingly preponderant in research in the sciences and the English-language social sciences, with 54 of the world's top 100 research universities as measured in the Jiao Tong ranking.⁹ The UK, other English speaking nations, Western Europe and Japan play important secondary roles and the European Research Area is gaining traction. The European nations have pledged to increase the level of spending on R&D to 3 per cent although not all will achieve this. Germany and probably, France are building a layer of top research universities. Via the German *Exzellenzinitiative* investment of 1.9 billion euros the designated universities may lead the regeneration

⁵ Marginson & Rhoades, 2002.

⁶ OECD, 2008.

⁷ Peters, et al., 2009.

⁸ Marginson, 2008b.

⁹ Shanghai Jiao Tong University Institute of Higher Education (SJTUIHE), 2008.

of German global capacity in higher education and research. At the same time China, Korea, Taiwan China and Singapore are becoming global knowledge powers.

¹⁰The 'innovation tigers'

China, Korea, Taiwan China and Singapore are the new 'innovation tigers'. They have invested heavily to position themselves at the forefront of the global knowledge economy, though the full benefits will not become apparent until the next generation.

A notable development of the last decade was the pluralization of research capacity in the sciences. Between 1995 and 2005 the annual number of scientific papers, produced in China rose from 9061 to 41,596. China was poised to overtake UK and Germany at the top of the EU table though its output remained 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, in Singapore 12.2 per cent and Taiwan China 8.6 per cent. In contrast, between 1995 and 2005 the number of papers produced by EU nations rose by 1.8 per cent per annum; papers produced in the USA increased by just 0.6 per cent per annum; and in the UK there was no increase.¹¹ In 2003 Singapore invested 2.24 per cent of GDP on R&D, a higher figure than Canada. The National University of Singapore is a standout university of the global era. Generously funded by government, it has an impressive range of foreign partnerships, and attracts a large number of foreign faculty who are paid at American university levels. This is possible because Singapore is one of the wealthiest nations in the world. In 2007 its national income per person was \$48,520, higher than the USA at \$45,850.¹²

However, the most important trajectory is that of China, where income per head was much lower than in Singapore, \$5370 in 2007. 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.¹³ (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, 2008; Figure 2). 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, but China is now the third largest investor on R&D in higher education, after the USA and Japan, at over \$10 billion in 2005. China's demography suggests vast long-term research potential. It will soon train the majority of the world's PhDs. At the same time China has lifted the quality in its universities by modernizing management and targeting funds, and expanded student participation in tertiary education. Between 1990 and 2005 the rate of participation rose from 3 to 20 per cent of the relevant age group.¹⁴ Between 1998 and 2005, enrolled tertiary students multiplied by 4.5 times and the

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¹¹ NSB, 2008.

¹² World Bank, 2008.

¹³ OECD, 2007; 2008a.

¹⁴ World Bank, 2008.

number of tertiary graduates multiplied by 3.7 times.¹⁵ Not only are such rates of growth unprecedented, China's educational growth is taking place in the country with the world's largest population.

Under former Prime Minister Mahathir bin Mohamad, Malaysia also attempted an 'innovation tiger' strategy that was focused on higher education, communications and multimedia. But Malaysia's strategy was less successful. Too much of its national investment was absorbed in student support, Malaysia's research universities lacked a strong performance culture, research funding was not at the levels of Taiwan or Singapore, it was difficult for creative foreigners to gain career employment, and faculty salaries were too modest to attract global talent. India is yet to become an innovation tiger. It lacks national policy will and the universities have been slow to modernize. Between 1995 and 2005 India's rate of growth of scientific papers was 4.5 per cent per year. Total papers at 14,608 in 2005 was one third that of China.¹⁶

Global comparisons of universities

The worldwide atmosphere of global rivalry and investments in innovation explains why nations compare themselves with each other in terms of the knowledge economy, just as they compare economic growth rates and other indicators. But it does not explain the origin of the particular mechanisms of comparison – university rankings, league tables and research performance metrics. After all, there are many ambiguities of university rankings; and there are few winners and many losers. Why did these particular mechanisms become so universally adopted in such rapid time?

The explanation lies in the nature of knowledge itself. As Joseph Stiglitz has pointed out, knowledge is a natural 'public good' in the economic sense.¹⁷ In their form as ideas and know-how, and as first creations of works of art; that is, as original goods; knowledge goods have little mass and their production is sustainable, requiring little industrial energy. It rests on donated human energy and time. Subsequently these knowledge goods can be copied, mostly with minimal resources, energy and time. The production of commercial digital goods is subject to scarcity but freely reproduced digital knowledge goods are not. The dynamic of knowledge goods is hyper-abundance not scarcity, very different to conventional economic goods.

Further, knowledge confers a potential advantage on its creator. But once it is placed in circulation and the 'first mover' advantage disappears, it can be accessed by anyone, and it has no market value. Thus the bulk of knowledge is hyper-abundant and that knowledge has no market value. It is hard to make sense of this in terms of economics. Yet knowledge is of great strategic economic importance.

How do the fast growing and chaotic open source flows of knowledge, which have no evident tendency towards predictability or equilibrium, become reconciled with a world of national hierarchies, economic markets, government agencies, and institutions that

¹⁵ Li, et al., 2008, p.5.

¹⁶ NSB, 2008.

¹⁷ Stiglitz, 1999; Marginson, 2008a.

require stability and control in order to function? How is this knowledge translated from the open source setting into more formal institutional settings? If the knowledge economy consisted solely or largely of commercial markets in knowledge goods, we would have a ready-made system for translating knowledge into ordered values. Market prices would do that. But as we have seen, most knowledge is public goods. Something more is needed, in order to differentiate between parcels of knowledge.

Enter university rankings, research performance metrics and journal hierarchies. My argument is that in the knowledge economy, the free flows of public good knowledge have become vectored by a new system of status production, the system of rankings and research and outcomes measures. These mechanisms assign values to different parcels of knowledge and arrange them in ordered patterns.

For a long time, formalization of the academic value of knowledge was a semi-formal and less the fully transparent set of procedures – institutional ranks and journal hierarchies seemed to operate by osmosis in elite academic circles rather than being formally measured and rendered transparent and universal. That is now all changing. The new systems tend to be transparent (though not always completely so), modernized, systematic and accessible. They can be readily used to identify the ‘best’ universities and ‘best research’ and so guide decisions about where to invest and how to improve national and university performance. Rankings and outcomes measures abolish the mystery of universities, or seem to do so. They can be readily comprehended from outside, in business and government and by families making decisions to invest in foreign universities. The system has emerged and been adopted rapidly because it fulfils an essential need both within the research university, and more so, outside the research university, in government and industry.

Fortunately, perhaps, the new systems for comparing universities and measuring their performance on a global scale have generally been shaped not by governments but by organizations especially well placed to imagine the global dimension: publishers such as Thomson using publication counts, the *Times* with its worldwide reach,¹⁸ webmakers like Webometrics,¹⁹ global agencies such as the OECD, and research centres within higher education such as the Jiao Tong Institute. Governments have become involved to a greater degree in constructing national ranking systems.

Issues and problems of comparisons

However, the new global instruments of comparison are associated with a number of issues and problems.²⁰ These vary by ranking system, as discussed below. The more obvious issues include such factors as weaknesses in data collection and computation; the arbitrary criteria used in ranking; and the arbitrary weightings and standardization procedures used in combining different data sets into composite indexes. A typical difficulty with ranking systems is that the results are used more broadly than is mandated by the data. There is also the circular character of the

¹⁸ Times Higher, 2008.

¹⁹ Webometrics, 2007.

²⁰ Usher & Savino, 2006; Marginson, 2007.

reputational surveys used in some comparisons. High reputation generates high ranking generates more high reputation, without any connection to performance.

A chief problem is that university rankings tend to inhibit diversity of provision over time. In any system of comparison, the measures will tend to favour those institutions whose mission profile fits most closely with the template for comparison. The current rankings systems mostly favour institutions that are comprehensive as to fields of study; strong in science-based disciplines, including medicine; well funded; staffed by faculty mostly research active rather than teaching only; and English-speaking, because English has eclipsed Latin, French, German and Russian to become the one global language of importance in science. In encouraging nations and institutions to do what they need to do to lift performance in the rankings, the process of comparison encourages them to shape higher education closer to the template used for comparative purposes. It encourages nations other than the English-language countries to imitate the traditions of higher education in the USA and UK, and to downgrade the research of their own people when it is expressed in the national language. It downgrades the standing of all institutions that do not fit the template: vocational higher education institutions, large access-oriented institutions whose mission is primarily teaching rather than research focused; specialist institutions in fields such as medicine, business, engineering, communications and the arts.

One way that comparison can be rendered more compatible with mission diversity is the use of a system for classifying institutions. Then separate comparisons can be conducted, between institutions of like mission in each case. Such a system of classification is currently being developed for the 3300 higher education institutions in the European Union and 4000 in Europe as a whole,²¹ paralleling the Carnegie classification in the USA. The number of institutions, and students, in Europe is broadly similar to the USA where there are 4194 institutions,²² though there are more diverse traditions and practices in Europe than in the USA. Van Vught emphasizes that classifications can enhance the benefits of rankings and minimize downsides.²³

If we wish to maintain and even increase the diversity of higher education systems, we will have to develop different ranking instruments in which different forms of institutional performance can be compared. We should design multiple ranking instruments that enable us to make inter-institutional comparisons per category or type of institution. In order to create higher levels of diversity in higher education systems, we therefore need to develop typologies of higher education institutions. In these typologies (or classifications) the diversity of institutional missions or profiles should be made transparent, offering the different stakeholders a better understanding of the specific ambitions and performances of the various types of higher education institutions.²⁴

Classifications have the potential to advance institutional and system transparency for business, government and students; facilitate mobility, especially cross-border

²¹ Bartelse & van Vught, 2007.

²² Eckel, 2008, p. 175.

²³ See also van der Wende, 2008.

²⁴ Van Vught, 2008, p. 21.

mobility; and provide an additional set of regulatory tools.²⁵ National or regional classification systems need to be relatively stable, while also being subject to periodic review with potential for moving into a new category as environmental circumstances change, or on the basis of a compelling case for formalization of a new mission. There would be significant challenges in establishing institutional classifications on an Asia-wide basis, let alone the global scale. A more modest project confined to the ASEAN countries might prove easier to achieve.

A further problem is that even if a system of rankings can be rendered meritocratic in that it rewards performance, the competition that it regulates scarcely constitutes a level playing field. Compare the United States with Indonesia. Indonesia is the fourth largest nation in the world and the largest Muslim nation. Its population is about three quarters that of the United States. There the resemblance stops. Indonesia is culturally rich but materially poor. Investment in higher education is low. The science system is embryonic, publishing 200 papers a year in English compared to 200,000 in the US. There is no way that Indonesian universities can compete with US research universities; nor should they be judged as ‘failures’ if they occupy a lower rank. In this context, to impose global rankings on Indonesia merely reminds that nation of how far it has to travel to be part of the global knowledge economy. It does no other good. It says us nothing about the strengths and weaknesses of universities in Indonesia.

Finally, the global comparisons focus primarily on research. The top 500 rankings by the Shanghai Jiao Tong Institute of Higher Education, and by the Higher Education Evaluation and Accreditation Council of Taiwan,²⁶ are solely confined to research. Data on comparative research performance fulfill the immediate needs of the knowledge economy and are more readily collected than data on teaching quality, student learning and university service functions. The Jiao Tong group finds that the only data sufficiently reliable for ranking purposes are broadly available and internationally comparable data of measurable research performance.²⁷ It is considered impossible to compare teaching and learning ‘owing to the huge differences between universities and the large variety of countries, and because of the technical difficulties inherent in obtaining internationally comparable data’.

However the absence of data on teaching and on student learning creates a major gap. Up till now, no ranking or quality assessment system has generated comparative data based on measures of the ‘value added’ during the educational process. Few international comparisons focus on teaching and learning as such. Various proxies for teaching ‘quality’ are used, such as quantity resource indicators, student selectivity (despite the fact that this is more likely to indicate reputation than teaching quality) and research performance. None of the proxies stand up to scrutiny: there is no consistent correlation between the quantity research indicators such as the staffing ratios used by the *Times Higher* ranking, and teaching quality. The notion that research performance is positively correlated to teaching quality or capacity belies the fact that ‘empirical research ... suggests that the correlation between research

²⁵ Bartalese & van Vught, 2007.

²⁶ Higher Education Evaluation and Accreditation Council of Taiwan (HEEACT), 2008.

²⁷ Liu & Cheng, 2005, p. 133.

productivity and undergraduate instruction is very small and teaching and research appear to be more or less independent activities'.²⁸

The situation may now be changing. At the request of the education ministers from the OECD nations, the OECD is currently running a project on the Assessment of Higher Education Learning Outcomes (AHELO).²⁹ The project is halfway through its development. Pilots are being conducted in a number of countries, on the basis of single higher education institutions rather than whole national systems. AHELO is collecting comparative international data in several areas: graduate outcomes as recorded in generic tests of intellectual skills, competence in two common disciplinary fields (economics and engineering), and employment outcomes for graduates; plus contextual data from each institution and nation that will assist with the interpretation of the comparative data. The technical and political obstacles are formidable. But it is probable that a global comparison of learning outcomes will take root. If so it would achieve great policy importance, though not as much as research rankings

National development

For most of the period since the second world war the accepted policy wisdom on the relationship between education and development was that elementary education should be built first, followed by secondary and higher education. This was supported by rates of return analysis. The flaw in the reasoning was the higher net rates of return on elementary education were driven not by the productivity of graduates from elementary education, but by the low cost of their education relative to the cost of graduates from secondary and higher education. However, graduates from secondary and higher education had higher levels of productivity. On paper, putting elementary education first was more efficient. But it locked nations into weak education systems, dependence on foreign expertise, and slow growth. In 2000 the accepted wisdom was set aside by the World Bank Taskforce on higher education in the developing world.³⁰

With the advent of the global knowledge economy, the policy context has changed again. In the global knowledge economy it is necessary to invest in all levels of education simultaneously. Modernizing economies and societies ultimately require universal literacy; and the definition of 'literacy', the level of cultural sophistication that is required in the workplace and in ordinary life, continually moves upwards. In all countries, over time, students are staying on longer at school, the standards required of graduates are becoming higher, and 'lifelong learning' is entering the policy lexicon. The knowledge economy also suggests the need to place priority on developing research capacity, including basic research programs and research training in a range of disciplines, rather than relying on other nations for research knowledge. To access research knowledge from elsewhere, even for the sole purpose of adaptation, needs an advanced research capacity in research at home. Modernization also generates the need for research in medicine and social science, as well as science and technologies. Thus to be globally competitive in the twenty first century, nations

²⁸ Dill & Soo, 2005, p. 507.

²⁹ OECD, 2008b.

³⁰ Taskforce on Higher Education in the Developing World, 2000.

need one or more research universities, comprehensive in the disciplines, actively connected within the global circuits of knowledge and capable of two way flows. In turn such universities must be capable of attracting and holding research talent.

In Singapore and Korea, the creation of world class universities has marched hand in hand with the achievement of near universal literacy at school.³¹ In the case of China, the government has pushed forward with the development of world class universities, and accelerated investment in research, prior to universal literacy. China is pioneering a new tertiary education-led model of growth. If it is successful in China, in lifting the nation from a low wage manufacturing economy to a knowledge-based economy, then this model of development is likely to become a standard. In a recent paper for the National Bureau of Economic Research in the USA,³² 'The higher educational transformation of China and its global implications', Li and colleagues comment that:

Previous efforts in other countries to use educational transformation as a mechanism either to maintain high growth or to initiate episodes of high growth have generally been regarded as unsuccessful, but the focus has been primary and secondary education, not tertiary. In China's case, these latest efforts seem to be motivated by a desire to maintain high growth by using educational transformation as the primary mechanism for skill upgrading and raising total factor productivity. If China succeeds, other countries may follow with higher educational competition between countries as a possible outcome.³³

When we consider the relationship between economic wealth, and investment in education and research, we find that on the whole the wealthy countries invest more in the knowledge economy than do poorer countries. The paradox of education and development is that while education helps to create wealth, the benefits of education (and more so research) take a generation to be realized, and the investment must be paid for in advance. Poorer countries are rarely in a position to invest in education at scale. It seems it requires wealth in order to generate wealth. However, China found a way out of the paradox. Taking advantage of continuing high growth rates, in the last 15 years China siphoned part of national income into the accelerated investment in knowledge. It sustained the investment, which was essential. The condition enabling China to become an 'innovation tiger' strategy, apart from high growth, was political will, the capacity to set objectives and concentrate resources over a long period.

Vietnam is still recovering from the devastation of the war. There have been priorities other than education. Nevertheless, Vietnam has been wisely guided to strong rates of economic growth. The coming global slowdown will affect growth in the next couple of years but not permanently. Like China the nation has shown a capacity to concentrate policy and achieve objectives. In principle, a knowledge economy strategy akin to that of China is within reach, if the nation so chooses. It would be a more modest strategy because Vietnam has a lower per capita income than China.

³¹ OECD, 2008c.

³² Li, et al., 2008.

³³ *ibid*, p, 4.

A university in the top 200?

It has been recognized that Vietnam needs to lift its tertiary education system to a more competitive level. On the 27th of July last year the Prime Minister of Vietnam signed a government decision on the Vietnam Higher Education System Planning Period for 2006-2020. The national plan included a projection that by 2020, at least one university from Vietnam would be listed in the world's top 200 universities. As noted, it was not specified which top 200 listing would be used as the template.

In principle this goal is right. As the foregoing analysis suggests, Vietnam will need a front rank research university, and preferably more than one such university, if the nation is to be strong in the era of the global knowledge economy. However, given the state of higher education and the level of national wealth, if a reputable top 200 list is used the goal becomes very advanced. Even under highly favourable circumstances it will take much longer than the year 2020. I will now explain these statements

Let us begin with the Shanghai Jiao Tong ranking. This is the most reputable ranking system because the data are objective and freely available. Institutions cannot manipulate their own data counts. It also provides a data set generally seen as the best measure of research capacity and the one that has achieved the most influence in policy. The Jiao Tong criteria are clear. First and second, to excel under in this ranking it is necessary to have sufficient Noble Prize winners on staff, and also to have educated Nobel Prize winners in the past. The great majority of the top 100 universities, and many listed at 101 to 200, are associated with at least one winner of the Nobel Prize.³⁴ There have been practically no winners of the science and economic prizes that have been located at universities in the developing world and it is unlikely that Vietnam will prove an exception to this in the foreseeable future. Winners of the Nobel literature and peace prizes are not included in the count.

The third criterion is the presence of HiCi researchers, researchers on the staff of the institution listed in the top 250-300 in their field of study on the basis of citations of their work in leading English language research journals. With the exception of Moscow State University, very strong in Nobel Prize winners, and the University of Buenos Aires in Argentina, all the top 200 Jiao Tong research universities have HiCi researchers, most have several, and Harvard has more than 300. There are nearly 4000 HiCi researchers in the American universities. In Asia, only Japan and Israel (which should probably be seen as part of Europe) have a large number of HiCi researchers, which is the mark of a mature research system. Korea, Singapore and China will have more such HiCi researchers in future years. To attract and/or hold a critical mass of HiCi researchers universities in Vietnam would need to offer close to global salary rates and infrastructure support, including personnel and equipment, that was competitive in world terms. This would require a large scale, concerted and sustained investment in universities designated for such development.

The fourth and fifth Jiao Tong criteria relate to the publication of scientific papers in the leading journals *Nature* and *Science*, and overall citation performance. HiCi

³⁴ SJTUIHE, 2008.

researchers sustain a strong performance here. As noted the number of papers produced by the emerging 'innovation tigers' has increased substantially since the mid 1990s. When this flows through into the growth of citation rates over the next decade, China, Korea and Singapore will move up the Jiao Tong ranking. With just over 200 papers per year Vietnam is not in a position to compete seriously on the basis of publication and citation volumes. If a China-style investment occurred, it would take 5-10 years before rates of publication took off and another decade for this to show itself in the citation counts, tasking us beyond the 2020 deadline. The achievement of a critical mass of HiCi researchers would take longer than this, perhaps 25-30 years, as the experience of China and Korea indicates.

The final Jiao Tong element is derived by aggregating university research performance on the first five measures and expressing this on a per staff member basis. It is designed to control for the bias in the measures in favour of very large institutions. Performance here is determined by performance under the other criteria and the extent to which staff are research active at internationally competitive levels.

In sum, the pathway to a top 200 Jiao Tong ranking, for the National University of Vietnam or any other Vietnamese university, is a long slow one and its achievement by 2020 is out of the question. Such an achievement would require a permanent shift to European levels of funding in one university or a small number of universities; and then would probably take at least 20-30 years. China has yet to place a university in the Jiao Tong top 200, though it has 18 universities in the top 500. Its leading universities in the Jiao Tong are Peking, Tsinghua, Nanjing, Zhejiang, Shanghai Jiao Tong itself, and the University of Science and Technology. All are listed in the group 201-300. China Taiwan has managed to push National Taiwan University into the bracket 151-200, and Korea's Seoul National is placed there also. The National University of Singapore is inside the world's top 150 research universities.

To achieve a top 200 ranking in the Times Higher requires a different set of criteria.³⁵ Half of the rankings index is compiled on the basis of two annual surveys. The main survey is of academic 'peers' and it is conducted through an email questionnaire sent all over the world. However, response rates are very low, about 1 per cent in 2006, and tend to be dominated by those nations that see the *Times* as an important newspaper. This largely means respondents in the former British Empire countries. The results of the *Times* ranking has tended to favour those countries. Little is known about the survey of 'global employers' as it is non transparent. To do well in the internationalization indicators it is necessary to enroll a high proportion of foreign students and include a high proportion of foreigners among the faculty. The student-staff ratio criterion rewards universities with relatively low numbers of students and/or large numbers of effective full-time staff, and is resource dependent. The final criterion, research citations per head, resembles those used in the Jiao Tong ranking.

The large weight of the reputational surveys in the index favours older research universities, especially household names such as Oxford or Harvard; favours universities that market themselves vigorously, including those institutions active in

³⁵ Times Higher, 2008.

the global market in degrees (these institutions are assisted also by the student internationalization indicator); and tends to help the leading national university in each country which is more likely to be recognized by foreign respondents to the surveys. Thus Peking University and Tsinghua have often figured in the top 50, and in various years Chulalongkorn in Thailand, the University of Malaya and UKM in Malaysia have figured in the top 200. Without the reputational survey this would not have happened. It should be said that few think that Chula in Thailand (an institution which I know and like) genuinely belongs in the world's top 200. Thailand's universities are not very outward looking and have yet to undergo the kind of investment and modernization normally associated with that level of performance. I suspect that Thailand only reached the *Times Higher* ranking because Thailand is a well known country for tourism and Bangkok is an important airport, driving up the 'recognition' factor. Perhaps if Vietnam institutes a program of academic tourism, subsidizing foreign university rectors in five star hotels, Vietnam National U could leap up the rankings!

It may be possible for a university currently placed well outside the *Times Higher* 200 to market itself so vigorously as to achieve that level, provided that research performance and/or staffing ratios were adequate, though the achievement would be unlikely to last as marketing alone is insufficient to cement a lasting reputation. But I must add that achievement of a top 200 ranking in the *Times Higher* ranking is less meaningful than a Jiao Tong top 200 ranking. In itself it would be insufficient to demonstrate national capacity in the global knowledge economy. The *Times Higher* ranking achieves significant publicity, and affects student decision-making in the global market. But the data are not taken very seriously by experts and the Jiao Tong data have more effect on policy and university strategy. The *Times Higher* criteria are often questioned and the data collection and compilation procedures are problematic. For example staff-student ratios are not a valid proxy for teaching quality, and the student internationalization indicator tends to reward not just good universities that enroll large numbers of foreign students but low quality institutions with a commercial agenda that set out to maximize total size, unlike research universities. Other problems include the 1 per cent return rate on the survey, the country bias in the survey returns and the procedures used to standardize data. The data outcomes in categories such as the peer survey and the staff-student ratio can be either stretched out (exaggerating the difference between high and low performance) or 'clumped' (pushing performances closer together), leading to dramatic shifts in the league table.

A key weakness of the Times ranking is that results have proven to be highly unstable from year to year. Universities rise or fall, often quite sharply, in a manner which bears no necessary relation to their performance. This can create serious problems for universities, and nations, whose performance suddenly drops as was the case with the University of Malaya in 2005. The *Times Higher* is a poor guide to policy.

The Webometrics ranking system rewards institutions and nations with a strong web presence. On one hand it is closely correlated to the degree of global connectivity through information and communications technologies. On the other hand it is shaped by factors affecting the Jiao Tong and the *Times Higher* like academic publication, stellar researchers, and institutional reputation and marketing. American institutions

do even better in Webometrics than in the other rankings. To secure a top 200 position in Webometrics it is necessary to invest in ICTs as well as research capacity.

Conclusions

I will move now to the two conclusions of the paper. First, in relation to the top 200 goal. I respect the government's decision to set a higher standard of performance for the national universities. If this goal is to be meaningful it should be based on a valid indicator that addresses the real national need for global capacity, and it should be achievable over time. In practice this means that the Jiao Tong ranking of research performance should be used; though if and when the OECD develops measures of learning outcomes, consideration could be given to establishing a second goal.

The top 200 objective is not a small ambition. It cannot be achieved through the efforts of university personnel alone. I am worried that if Vietnam does not achieve a top 200 university in 12 years then it may seem that the universities have failed. It needs to be noted that it is impossible to achieve a top 200 Jiao Tong position by 2020 even if investments at the Chinese or Korean level are implemented immediately. A more realistic but still difficult goal would be the achievement of a top 500 Jiao Tong university by 2025 or 2030. There are a small number of emerging nations in the Jiao Tong top 500, including Mexico, Brazil and India. At this stage only India has a GDP per head at the Vietnam level. India has concentrated resources in a small number of high quality 'enclave' institutions. At the other extreme of population size and wealth, Singapore is pursuing the same strategy. Perhaps this is what Vietnam could do, to secure earlier entry into the main knowledge economy game.

The building of an enclave research university or small group of universities would require incentives to bring back to Vietnam nearly all of those who do their PhDs in the USA and Europe. Eventually it would mean paying some faculty at near American levels of salary to hold them; and offering foreigners a similar deal as Singapore has done (though here even Singapore has had trouble holding the foreigners for long enough to have a lasting impact on research capacity). The creation of high quality enclave universities would probably also require root and branch reform of university organization and faculty culture, while retaining a clear national identity.

A more realistic timetable for the top 200 university would be 2060 or later but success would depend on factors that we cannot forecast in this symposium. It is as difficult to become a leading world university nation as it is to become a leading world economy, or to secure world leading military power. Many other things have to be sacrificed to achieve the goal. All of this underlines the point that the funding of higher education and research funding partly depends on economic growth. But only partly. With sacrifices and wise policy choices, it is possible for an emerging nation to invest well in education and research so as to move ahead of the funding level suggested by its growth position. China has done this in research. Since 2000 its investment in R&D has increased 50 per cent faster than the growth in the economy as a whole.

Second, there is the question of the relationship between the research intensive universities in Vietnam and the other higher education and tertiary institutions. To

achieve the full set of national policy objectives in higher education, training and research, it is necessary to maintain mission definition, while providing a policy framework that encourages all institutions to perform their missions transparently and as well as possible. The criteria used to judge global research universities that are comprehensive of fields of study should not be extended to vocational institutes and specialist academies. Vietnam should discourage external rankings agencies from including vocational and specialist institutions in global research counts. However, in both kinds of institution, there may be policy gains to be made by using selective international benchmarking with similar institutions in ASEAN and elsewhere.

National rankings should be underpinned by a classification system that separates institutions into different groupings based on mission, and manages rankings within the groupings. A single national ranking of all institutions would drive institutions at the 'lower levels', including those charged with specialist non-research missions, into strategies of imitation at a low level of performance that would weaken their missions.

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