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Higher education in the global knowledge economy

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Note concerning sources: The deadline for submission of the paper (15 September 2007) fell four days before release of the 2007 edition of the Organization for Economic Cooperation and Development's annual compilation of comparative international data on education, Education at a Glance. This is the most advanced and dynamic of the collections of comparative statistics on education, though it does not include all countries. When the paper is presented in Beijing in November 2007 the slides will utilize updated statistical data from this source and from UNESCO and the World Bank to illustrate points made in the paper.

Abstract

In many nations government policy and scholarly work have identified the growing role of higher education and research in the world-wide knowledge economy. The role of higher education is not limited to fostering the economic development of nations and providing opportunities for individuals, it extends also to promotion of cultural diversity, political democracy and trade. Emphasis is rightly placed on how higher education can better serve society and promote international cooperation. However, as yet little attention has been given to how higher education and research are themselves being reshaped by globalization, with significant 'feed-back' effects into nations.

Higher education and knowledge are simultaneously global, national and local (Marginson and Rhoades, 2002). Higher education is nested in national government everywhere, and shaped by patterns of social investment. At the same time the cross-border or global dimension of activity is growing, especially in relation to knowledge. By studying the changing global landscape of higher education, we can draw out the implications for the policies of governments and national identity, for the developmental strategies of universities, and for international agencies.

The paper maps, summarizes and synthesizes this changing global landscape. It focuses on trends and patterns in the cross-border mobility of students and staff, the growth of educational trade, research publication and research concentrations by nation, ICT-connectivity, language of use, and cross-border policy flows. Most of the interaction between nations in higher education takes the form not of trade but of free exchange and cooperation, i.e. the production of global public goods. The paper draws on (1) recent research for policy papers prepared for the OECD on globalization and higher education, and the internationalization of higher education in the Asia-Pacific region, (2) case studies of leading research universities in eight Asia-Pacific nations, and (3) comparative data from the OECD, UNESCO and the World Bank.

While there is a general trend to increased international engagement of higher education, the actual level of engagement, and knowledge economy capacity, vary markedly between nations and regions. One feature of the global knowledge system is the position of the United States, with 54 of the top 100 research universities in the 2007 Shanghai Jiao Tong listing, and one third of the world's scientific papers. The USA is a magnet for world-wide talent, enrolling 100,000 foreign doctoral students. But a new wave of Asian science powers is emerging in China (including Hong Kong and Taiwan), Singapore and Korea. In China, between 1988 and 2001 the number of scientific papers produced each year multiplied by 4.5 times. In Singapore the ratio was 6.3 times. From 2003 to 2007 the number of universities from China in the Jiao Tong top 500 rose from 18 to 25, with mainland universities rising from 8 to 14. Shifts of this magnitude suggest that in higher education and research a more pluralistic cultural and linguistic environment will develop.

1. Introduction

In many nations government policy and scholarly work have identified the growing role of higher education and research in the world-wide knowledge economy. The role of higher education is not limited to fostering the economic development of nations and providing opportunities for individuals, it extends also to promotion of cultural diversity, political democracy and trade. Emphasis is rightly placed on how higher education can better serve society and promote international cooperation. However, as yet little attention has been given to two elements. The first is how higher education and research are among the primary forces shaping globalization. The second is the manner in which higher education and research are themselves being reshaped by globalization, with significant 'feed-back' effects into nations.

Higher education and knowledge are simultaneously global, national and local (Marginson and Rhoades, 2002). Higher education is nested in national government and shaped by patterns of social investment. At the same time the cross-border or global dimension of activity is growing, especially in relation to knowledge. By studying the changing global landscape of higher education, we can draw out the implications for the policies of governments and national identity, for the developmental strategies of universities, and for international agencies. The paper maps, summarizes and synthesizes this changing global landscape. It understands globalization as a process of cultural change as well as economic change, and in terms of diversity as well as uniformity. It also notes that most cross-border interaction in higher education and research takes the form not of trade but of free exchange and cooperation, that is, the production of global public goods. The paper draws on recent research for the Organization for Economic Cooperation and Development (OECD) on globalization and higher education, and the internationalization of higher education in the Asia-Pacific region, (2) case studies of leading research universities in eight Asia-Pacific nations, and (3) comparative data from the OECD, UNESCO and the World Bank.

2. Higher education and globalization

In the world-wide setting, higher education is manifest simultaneously in three dimensions: the global, the national and the local. The term '*global* dimension' refers to the world level, to a planetary spatiality. 'Global' refers to spaces, systems, relations, elements, agents and identities constituting and constituted by the world as a whole or by large parts of the world in pan-national regions, such as Europe or East and Southeast Asia. It includes global flows in communications, transport and financial systems, and in cross-border movements of people; and elements such as language and research exchange that integrate nations and individual agents across borders. 'Global' as used here rests on a particular configuration of the general and particular. The 'global' dimension does not mean total or universal. It does not necessarily include every national and local element, only those elements that are part of the constitution of the world as an integrated world. (The term 'world-wide' can be used for the totalizing inclusive concept that takes in every global, national and local element).

Globalization

Thus 'globalization' refers to the making or the enhancement of these global spheres of human action, including global spaces, systems, elements, agents, identities and practices. Globalization consists of engagement, integration and convergence on the world scale, the 'transformation in the organization of human affairs by linking together and expanding human activity across regions and continents' (Held and McGrew, 2000, p. 54). Held and colleagues define globalization in short as 'the widening, deepening and speeding up of world wide interconnectedness' (Held et al., 1999, p. 2). They have also developed a more detailed definition specifying global transformations in space/time (also see Harvey 1990; 2006). As globalization advances cross-border interactions become more extensive, intensified,

regularized and faster. Local and global dimensions are more intermeshed: local events can be transmitted everywhere and distant events have a magnified impact. ‘Globalization’ is:

A process (or set of processes) which embodies a transformation in the spatial organization of social relations and transactions – assessed in terms of their extensity, intensity, velocity and impact – generating transcontinental or regional flows and networks of activity, interaction, and the exercise of power (Held and McGrew, 2000, p. 55).

While international relations across borders might involve just two nations (hence ‘international’) globalization takes in many nations. It is a dynamic and not always predictable process that draws the local, national and global dimensions more closely together. The essence of globalization in this era is the manner in which it combines economic and cultural elements. It is a symbiosis of economic changes and cultural changes, and a symbiosis of public and private goods.

On one hand globalization rests on the formation of world-wide markets creating private goods, operating in real time via automated processes and underpinned by the first world-wide system of financial exchange in interlocking financial systems; and growth rates of foreign direct investment that far exceed economic growth as a whole. With instantaneous transmission of financial information the turnover time of economic capital tends towards zero (Mandel, 1975); the world economy moves faster and global operations become more transformative of the localized parts. The economic aspect of globalization and the wealth generated in trade are the aspects that generally command the most policy attention and constitutes the subject matter of bodies such as the World Trade Organization (WTO).

On the other hand globalization also rests on the creation of the first world-wide systems of communications, information, knowledge and culture, tending towards a single world community as Marshall McLuhan (1964) predicted. Ever extending networks based on travel, mobile phones, broad-band Internet and other information and communications technologies (ICTs), are creating new forms of one-to-one human association, of unprecedented scale and flexibility; spanning cities and nations with varied cultures and levels of economic development; and enable the complex data transfers essential to knowledge-intensive production. Much of this domain consists of public goods and part public goods that are subsidized and/or provided by governments, for example telecommunications in some nations, higher education which is subject to mixed public and private funding and basic research which is largely government funded everywhere. It is the processes of communications and information, where the economic and cultural aspects are drawn together, that above all constitute what is new about globalization at this time. Inclusion and exclusion in relation to ICT networks and knowledge have become key dividing lines in shaping power and inequality in the global landscape (Castells, 2000; Giddens, 2001).

Economic globalization and cultural globalization are thoroughly enmeshed in each other and mutually dependent. World-wide systems of communications, knowledge and culture provide the medium for the evolution of world-wide markets and are essential to instantaneous financial decisions. In turn economic competition and the accumulation of wealth power the roll out of communications and the global standardization of knowledge and cultural forms, not least in higher education itself. Here public goods are being mobilized by nation-states and global agencies to sustain the production of private goods, while the drive towards private goods is functioning as an essential motive for the expansion of the space for the common good. Both Adam Smith (1776/1979) and Karl Marx would recognize the processes at work and in the *Grundrisse* Marx (1851/1973) foreshadowed most of them.

Higher education

Higher education is closely implicated in all of this. Education and research are key elements in the formation of the global environment, being foundational to knowledge, to the take-up of technologies, to cross-border association and to sustaining complex communities. Though higher education institutions often see themselves as objects of globalization they are also its agents (Scott, 1998). Major research universities are among the key sites and drivers of globalization all over the world and often primary agents in opening up their nations to global engagement. They are intensively linked between the global cities that constitute the nodes of a networked world (Castells, 2001; McCarney, 2005). Characteristically global cities have a high density of participation in higher education; and there is a strong positive correlation between the higher education enrolment ratio of a nation or a region, and its global competitive performance. Correspondingly, nations and regions that are relatively decoupled from the globally networked economy are typified by a low density of higher education.

Because they are deeply immersed in these global transformations, higher education and research in higher education are being transformed on both sides of the economy/culture symbiosis. Higher education is swept up in global marketization. It trains the executives and technicians of global businesses; the largest student growth is in globally mobile degrees in business studies and computing; the sector is shaped by economic policies undergoing partial global convergence, and a first global university market has emerged, symbolized and concretized in the development of world-wide university rankings, particularly by the Shanghai Jiao Tong University Institute of Higher Education (SJTUIHE, 2007). Even larger changes are happening on the cultural side of higher education. Teichler (2004) remarks that 'it is surprising to note how much the debate on global phenomena in higher education suddenly focuses on marketisation, competition and management in higher education. Other terms, such as knowledge society, global village, global understanding or global learning, are hardly taken into consideration' (Teichler, 2004, p. 23). It is surprising because while higher education is a second level player in the circuits of capital and direct creation of economic wealth, it is pivotal to research and knowledge, constitutive in language, information and cross-cultural encounters, and has many connections with media and communications. Information and knowledge are highly mobile, readily slipping across borders, so that the cultural sphere of higher education, in which research and information are produced, is actually more globalized than the economic sphere. Above all there is the Internet, supporting intellectual goods whose use value far exceeds the cost of their distribution and consumption. Advanced higher education is now unimaginable without it. The Internet facilitates world wide databases and collaboration between academic faculty, stimulating more face-to-face and electronic meetings, and also cross-border e-learning (OECD; 2005a).

At the same time higher education institutions remain sensitive to their national missions and to their local communities and industries. Research universities remain national even while they are becoming more international. In fact in this era these institutions have become increasingly essential to the strategies of national policy makers for economic competitiveness and international cooperation. Thus the increasingly globalized character of research, knowledge and higher education brings with it complex changes at the interface between the institution, the nation and the global dimension, which will now be considered.

3. Types of global transformation

National higher education systems and institutions across the world do not experience global flows and relationships in a uniform, even, consistent or entirely predictable manner. Nations and institutions have varying potentials to absorb, modify and resist global elements at home and to engage and act across borders in a global setting which affects them in different ways. Douglas (2005) makes the point that 'all globalization is local' in that global convergences are subject to local, sub-national and national influences and countervailing forces, including governmental regulation and academic cultures. Accordingly, national policy makers and the

executive leaders of institutions now face a complex strategic environment. They pursue their own pathways, articulated through national tradition and open to their own strategy making, yet they no longer have full command over their destinies. A base level of global flows and forces in higher education is inescapable. Some impact institutions directly, others are mediated. The old policy-making circuit linking national/state government to institution has been partly broken open. Institutions and nations vary in the extent to which they are engaged with and open to global flows. Again, the extent of engagement is partly (but only partly) under their control. Nevertheless, the nation is not fading away as some theorists of globalization have argued; and it remains the major influence in the higher education sector, as it does more generally in the economy and in day-to-day life (Fligstein, 2001 estimates that about 80 per cent of production remains nation-bound). The great majority of institutions continue to be nationally embedded and dependent on government for legitimation and resource support. In most though not all nations, government remains the principal financier and the national public sector the main provider, and though the role of the private sector is growing (Altbach and Levy, 2006) it is mostly subject to regulation. International agencies play a relatively minor direct role in higher education, though they are important transmitters of policy ideas. Multilateral negotiation in higher education is still unusual except in Europe.

Most governments devolve some policy functions to institutions, and some have partly deregulated higher education (though less often basic research). The more autonomous evolution of institutions has been encouraged by corporatization and partial devolution under the auspices of the new public management, characterized by steering at 'arm's length' and more plural income raising. Some institutions operate relatively independently across borders, and are encouraged to do so by governments that see this as necessary to enhancing global effectiveness. Here there is considerable variation around the world by nation and by institutional type. Research-intensive universities, especially major ones, and private institutions (especially commercial entities) normally enjoy the most global autonomy. However, no governments legislate themselves out of higher education altogether. The fact that global economic competition is seen as knowledge-driven has magnified policy interest in the sector. In some nations the cross-border relations of institutions continue to be largely administered by the national authorities, though this approach may tend to inhibit global responsiveness; and in all nations governments indirectly affect the cross-border dealings of institutions via resource levels and incentives and the frames for communication, cooperation and mobility. The concerns of policy makers are to render higher education more competent for the global era, to leverage its benefits for national development, to lift performance and value for money and to devise an appropriate set of steering instruments and behavioral incentives, with balances between competition and cooperation, to achieve these ends.

As the above suggests there is much scope for variation in relations between global, national and institutional elements. In sum, in higher education there are three kinds of potential global transformation, with varying implications for nation/institution relations:

- Global processes of an integrationist type that are distinct from national ones, that once established are difficult for national agents to block or modify, for example the development of Internet publishing; the formation of a global market in high value scientific labour, distinguishable from and to some extent over-determining the separate national labour markets.
- Global systems and relationships that engender a pattern of common changes in national higher education systems, leading again towards convergence and integration. Examples include the use of English as the language of academic exchange, and the convergence of approaches to doctoral training. The question here is not just whether cross-border effects are manifest at the national level but whether these effects lead to global homogenisation.
- Parallel reforms by the different autonomous national governments, following common ideas and templates, which tend to produce some convergence and also

facilitate inter-connectivity between different national higher education systems. One example is the selective changes inspired by the Anglo-American templates of the new public management, though as noted there is much scope for national and local nuancing. Note that this cross border ‘parallelization’ is facilitated by homogeneity in a national system and retarded by intra-system diversity.

Changes generated under national auspices, type 3 transformations, can lead to a tipping point that facilitates global transformations of types 1 and 2. Likewise transformations of type 2 can establish favourable conditions for type 1 transformations.

Global ‘relativization’

As transformations type 1 and 2 suggest globalization has ‘relativized’ all nations and higher education institutions (Waters, 1995) to at least some degree. They have become referenced to the requirements and measures of informal global standards, facilitated by worldwide publication and by the uneven tendencies to convergence and harmonisation in degree structures, recognition and quality assurance. International trade and market competition, for example in the education of foreign students and online programmes (OECD, 2004a; 2005a), encourages cross-border comparison between systems and institutions. International benchmarking of institutions and disciplines is now ubiquitous. Performance counting in research, and global university rankings, take this process of global relativization further and drive it home into the thinking of university leaders at the institutional level. In each nation governments, media and public have become fascinated by the comparative global performance of their institutions. There is a danger that in locating institutions in this way, higher education is modeled as nothing but a world-wide competition of individual institutions in which differences in national context and potential are obscured. University rankings are a valuable tool for university leaders and government, revealing as they do world-wide patterns in the location of knowledge power and resources (SJTIHE, 2007). On the other hand when not conducted well, when characterized by inaccuracies (THES, 2006; Marginson, 2007) or used by groups to advance their interests or secure particularistic national advantages, rankings can lead to over-simplification of the complex relationships between the global, national and local dimensions (Marginson and Rhoades, 2002) and an undue focus on the competitive aspect at the expense of international cooperation.

While the nation-state remains part of the higher education picture, and vice versa, global transformations are together associated with two key changes. Governments everywhere are grappling with the meaning of these changes and the reworkings of national potentials, policy imperatives and strategies that are entailed. One change is that in some respects higher education and research have been partly ‘disembedded’ from nation states. The second change is that global private goods and global public goods in higher education and research take an additional importance, especially global public goods. The next section of the paper considers examples of ‘disembedding’, and the following section looks at global public goods.

4. Partial tendencies to ‘disembedding’ from the nation

What are the implications of the fact that competition and the market in higher education are now defined at an international or global level, as well as the national or local level? Does the fact that individual academic faculty and their institutions engage in international activities and global networks impact governance? Beerkens (2004) defines globalization as ‘a process in which basic social arrangements within and around the university become ‘disembedded’ from their national context due to the intensification of transnational flows of people, information and resources’ (see also Held, et al., 1999). One hypothesis posed by the changing patterns and forces is that higher education institutions are becoming and will

become increasingly disembedded from their national contexts because some driving forces of globalization exceed the strength of national factors. The disembedding hypothesis characterises the relationship between global and national elements not as symbiotic (as in the notion of the national domain as a filter of global effects) but as zero-sum.

Forms of 'disembedding'

There is evidence of the potential for disembedding in several areas. The first is funding. Pressure on national public funding for higher education in certain countries has encouraged or forced institutions to seek additional income from cross-border sources. This includes most institutions in the United Kingdom, Australia and New Zealand, and some four-year institutions and community colleges in the United States affected by state budget cuts. For example Australian universities have increased their revenue from full-fee paying international students from 5.8 per cent of university income in 1995 to 15.0 per cent in 2005 (DEST, 2007). Although these percentages are not yet overwhelming, the growth of cross-border education has the potential to pluralize institutions' national missions. International students may crowd out the capacity to educate domestic students; though in nations that retain a significant number of international students as future high-skilled migrants the augmented human capital might be seen as consistent with national objectives.

A second example is again related to cross-border teaching programs. By operating either virtually or physically across national borders, institutions exceed the boundaries of their enabling legislation. Governmental powers to regulate services performed abroad by their national institutions, and services performed by foreign institutions at home, tend to be undeveloped or limited; partly because of inadequate regulatory reach, and partly because institutions that are public providers in their national context tend to operate as private entities abroad and are thereby complicit in disembedding themselves from the national context. The resulting lacuna in regulation raises many issues in areas such as quality assurance, funding and the recognition of qualifications.

A third set of examples of potential disembedding lies in research, where funding is becoming more available and accessible at international and supranational levels. Research themes and teams are more often internationally defined and composed.

A fourth example is cross-border accreditation. There are many cases of institutions seeking accreditation outside their national context (Altbach, 2003; OECD, 2004b), for several reasons: lack of accreditation opportunities at home; using international accreditation to enhance relative national position; using international accreditation to evade the requirements or prohibitions of national accreditation; enhancing global recognition via accreditation by a reputable foreign accreditation body. Some national accreditation agencies also have motivations for exporting their services (Eaton, 2003). The small group of would-be global accreditation agencies has a vested interest in expanding the role of global referencing in accreditation, by fostering a global space and encouraging more radical disembedding.

The disembedding of institutions from their nation may begin in transformations of type 2 and 3, such as the creation of funding incentives to raise monies from international students, but has the potential to partly transfer the institution into the global dimension, generating type 1 effects difficult to control or reverse at the national level. At the same time, in order to assess the extent to which institutions are disembedded from their national contexts, the scale and magnitude of these developments should be considered. At this time in most nations, the education of foreign students plays a marginal role in relation to nationally based institutions. It is rarely been a driver of pedagogical orientations even in the United Kingdom and Australia; and while it has shaped the missions of some lesser status institutions in those countries that are highly dependent on international revenues, it has not greatly affected the orientation of the leading institutions.

However, in most nations the global market plays a larger and potentially more transformative role in doctoral education, through the exit of their own nationals to doctoral programmes abroad and/or the doctoral education of foreign students on home soil. World-wide doctoral education, like research more generally, is one area that has been clearly globalized and where the disembedding potential is particularly obvious.

Varied potential for 'disembedding'

The potential for disembedding is also a function of particular institutions in diversified national systems. Despite some shifts in resource sources and student composition, elite institutions continue to be the national standard bearers of prestige and high quality. Globalization has often had a greater direct impact on second tier institutions. They might have to merge or otherwise reorganise in order to address new forms of competition, and being locked out of the elite segment in the nation, they might leverage globalization to improve their strategic options at home. One case is Mexico where some private sector institutions have a much stronger global orientation than the Universidad Autonoma Nacional de Mexico (UNAM), the leading public sector research university and the dominant provider in Mexico overall. In many nations private sector institutions have more freedom to vary their mission, clientele and global engagement.

When some institutions are more disembedded than others, a national system of higher education becomes a complex amalgam in which institutions have varying degrees of national accountability. This stretches the capacity of existing steering instruments. Moreover, if policy and governance do not keep pace with shifting missions and expanding cross-border activities, institutions will be de facto disembedded to the extent that parts of their operations fall altogether outside national governance structures and regulatory frameworks. Here governments and institutions are in uncharted waters. Few means of international or global governance have yet developed. One of the small number of examples is the UNESCO/OECD *Guidelines for Quality Provision in Cross-border Higher Education* (OECD, 2005b). As well as the fact that national policy, funding, regulatory and quality frameworks are falling short in their reach, there are larger questions at stake. Where are the partly disembedded institutions accountable for their international activities and outreach? Should the creation of global public goods (below) be seen as part of their public service remit? But who are their global stakeholders; and why and how should they be held accountable to them?

These challenges are more than technical, they are conceptual and political. National public higher education systems were always held to coincide with national priorities, legislation and territory. In the wake of the trends to more extensive and intensive cross-border activities, the notion of 'public' education, and the related notions of priority, responsibility and accountability, are in question and may have to be reworked. 'Public sphere', 'public interest' and 'public good(s)' are obtaining new dimensions and meanings.

The next section will expand on the growing potential for global public goods.

5. Global public goods in higher education and research

In industries focused solely on cross-border trade the global setting is imagined simply as a trading environment. National and cross-national regulation assessed in terms of their potential to affect flows of goods and capital, as in WTO negotiations. But matters are more complicated in higher education. Global trade is part but not the whole or even the most important part of cross-border relations, and much of the decision making takes place in governments or is otherwise framed by public interest. In higher education cross-border flows of people, technologies, communications, ideas and knowledge are important in their own right, as well as for trade. Higher education produces a complex mix of private and public goods in both national and global dimensions (Marginson, 2007). The global private goods

include the degrees obtained when crossing national borders and those outcomes of commercial research traded across borders prior to their entry into the public domain. These private goods pose new problems of quality assurance and consumer protection across nations. However, global public goods constitute the larger and more transformative agenda, posing new challenges for both nation-states and multilateral forums and agencies.

Nature of global public goods

Public goods play an enhanced role in higher education because of the intrinsic nature of information and knowledge. Knowledge constitutes public goods in the technical economic sense, whether it is produced in government owned or funded institutions or not. As defined by Paul Samuelson (1954) 'public goods' (which here includes economic services) are goods that are non-rivalrous and non-excludable. Goods are non-rivalrous when they can be consumed by any number of people without being depleted, for example knowledge of a mathematical theorem. Goods are non-excludable when the benefits cannot be confined to individual buyers, for example law and order, or social tolerance. Goods with neither quality are classified as private goods. In this sense knowledge, especially basic research, is an almost pure public good as is often pointed out in the literature (e.g. Stiglitz, 1999).

As Samuelson also noted, public and part-public goods tend to be under-provided in economic markets. Yet such goods are also central to the workings of advanced economies, societies and polities, especially in globalized environments and in production where the knowledge component is enhanced. An immense array of information and knowledge generated in higher education, notably the outcomes of basic research, is openly accessible and subject to nominal charges well below its use value and below its costs of production. Arguably, in policy on research in higher education in some countries there has been an undue focus on creating commercializable contents, given the public good character of most of the knowledge goods produced. Once research findings, and online courseware, are released they can be copied many times without losing further value. Their broadest distribution optimises the common good. While particular knowledge-intensive products can be subjected to intellectual property arrangements, attempts to unduly restrict the transmission of basic knowledge and intellectual know-how through such arrangements are impractical; and also regressive, because they reduce the common good which lies in the free circulation of the knowledge. The mathematical theorem sustains its value no matter how many times it is used; and once it is part of the public domain it is scarcely possible to stop anyone from learning it.

The essential private goods in teaching and learning are not the content of courseware - which once the product is out there becomes a natural public good - but the brands, positional advantages, networking and high quality teaching provided in elite institutions. Likewise, in research the volume of freely exchanged knowledge in the public domain far exceeds that of tradable intellectual property; though many public knowledge goods enter the chain of value-creation in other industrial sectors, and in this respect higher education has a crucial two-step role to play in the accumulation of wealth. (The fact that the knowledge-creating work of higher education institutions is both relatively global in character *and* subject to market failure and public subsidy contradicts the assumption that globalization in higher education is simply driven by trade and market competition). This also highlights the importance of open source models of ICT use, that enable public knowledge goods to become universally accessible, maximizing their utility to industry and to national and global society.

Here strategies to maximize public goods can be pursued by individual institutions as well as by governments. MIT moved early to use the Internet this way, providing its courseware on the basis of open access, thereby also promoting itself as the intellectual originator of the learning and strengthening its global brand. MIT thereby aligned its strategies to the intrinsic nature of knowledge and information and to its own nature as a knowledge forming organization. Other institutions have tried and failed to make money by

offering online teaching in which web-based courseware is presented as a private good, even though most such contents can already be downloaded from the Internet free of charge (Marginson, 2004).

Online education and research each highlight the augmented potential for public goods in the global dimension. Global public goods can be defined as goods that have a significant element of non-rivalry and/or non-excludability and are available across populations on a global scale. They affect more than one group of countries, are broadly available within countries, and are inter-generational; that is, they meet needs in the present generation without jeopardising future generations (Kaul et al., 1999, pp. 2-3).

Global public goods in higher education include collective global goods, and also positive or negative global externalities. Collective global goods are obtained by nations and/or institutions from cross-border systems common to the world or a meta-national region, for example regulation, systems and protocols that improve cross-border recognition and mobility; such as the Washington Accords in Engineering, and the Bologna Declaration's higher education space. Global externalities arise when education in one nation significantly affects people in other nations; for better, such as the positive contribution of research flowing across national borders; or for worse, such as the net 'brain drain' of national faculty. In their positive form, like other public goods, global public goods tend to be under-provided in markets. Multilateral forums can directly create such global public goods, for example collective world-wide recognition systems and academic freedom protocols, and UNESCO, the OECD (2004b) and EU have all advanced the discussion of these elements. Cross-border externalities are more difficult to regulate. There is no agreed basis for identifying, measuring, costing and financing 'downstream effects' between one nation and another even in the sphere of the environment where such effects are acknowledged. In higher education and research, only brain drain is an active issue and policy tools for measuring and redressing it are as yet under-developed.

Global goods and nation-states

The creation of new global public goods in higher education occurs both in the space created by the partial disembedding of institutions, and also alongside the more traditional creation of public outcomes at the national level. In one respect it bypasses national governments and brings new non-government actors into play; in another respect it is dependent on national and regional authorities and on inter-governmental negotiation. Akin to the overall process of globalization itself, global private and public goods take three different roles viz a viz nation-states. First, they can act as *substitutes* for nation-states and traditional practices (that is, orthodox national public and private goods) in higher education. Second, they can be *supplementary* to nation-states. Third, global goods can be *complementary* in that they are joined symbiotically with those national governmental and institutional frameworks that are the vehicles for global transformations. Again, the relationship between national and global elements is ambiguous, with both zero-sum and positive-sum aspects.

However the strategic possibilities and policy problems of global public goods are largely unexplored. The absence of an agreed analytical and policy framework for operationalizing global public goods (especially externalities) in the national interest, let alone the mutual international interest, predisposes policy makers to neglect those goods (Kaul et al., 1999; Kaul et al.; 2003). The problem is, 'in the international sphere, where there is no government, how are public goods produced?' (Kaul et al., 1999, p. 12; Marginson, 2007). There is a gap between global effects, especially type 1 effects, and national policy frameworks. Global public goods remain largely unrecognized because the conceptual frameworks of orthodox political science, and the frameworks of orthodox policy making, are unable to imagine them.

One example is the absence of adequate social and economic protections for temporarily mobile populations in higher education, such as students, executives and administrators, and faculty, who cross borders for the purposes of education and research. People travelling across borders for education or work are unable to exercise the full rights enjoyed by local citizens, such as access to government services and legal representation, and economic freedoms such as maintaining bank accounts, securing loans or purchasing property; and their opportunities for redress in relation to injury may be restricted. In nations such as the United Kingdom and Australia many cross-border students enter the lower sub-strata of the workforce and can experience discriminatory or exploitative work practices. Questions of the economic and social security of cross-border populations in higher education can extend also to social welfare, health care, housing rights, and freedom from discrimination. These issues invoke problems of national and international law, policy and governance that have immediate practical importance for many people but are inherently difficult to address because they push beyond nation-state frameworks. Precisely because such issues of cross-border security are generated in cross-border movement, single national governments do not ‘own’ those issues and they normally face limited domestic political pressure to address them.

For the nations sending students abroad for education, the problems of their citizen-students tend to be addressed only in exceptional circumstances by foreign missions and through bi-lateral negotiation with the nation(s) of education. For nations that receive students for the purposes of education, because these are not their own citizens, there is limited support for them. The rights of such students are sometimes treated as consumer rights, for example in Australian legislation; or rights to pastoral care during their education as in New Zealand; but not in terms of the full range of human and civil rights; though foreign students and visiting faculty often contribute to social and cultural life, some pay taxes, and some later become citizens of the nations in which they are educated. Nor have the international agencies addressed the social and economic security of people in education and other sectors that move across national borders, except in relation to categories such as refugees. For example, while the International Labour Organisation (ILO) includes migration within its concerns, it explicitly excludes students from its definition of migrants (Deumert et al., 2005).

Though globalization enhances the potential for both global private goods and global public goods in higher education, it has proven difficult for national governments to design policies so as to optimize the flows of both kinds of good simultaneously. Global public goods receive only sporadic attention, more in their negative form as brain drain than in their positive forms. Nations can control the externalities they generate with effects on others, these are type 3 global effects; but not the externalities they are subjected to by higher education in other nations which are type 1 global effects. National governments can secure regulatory control over type 1 externalities and collective global goods only in the framework of multilateral negotiations. But though the regulation of private trading goods in education is negotiated in WTO/GATS there is no global policy space in which to consider global public goods in higher education. There is a role here for international agencies, not as surrogate for a supra-national public interest but in setting the ring for cross-border negotiations.

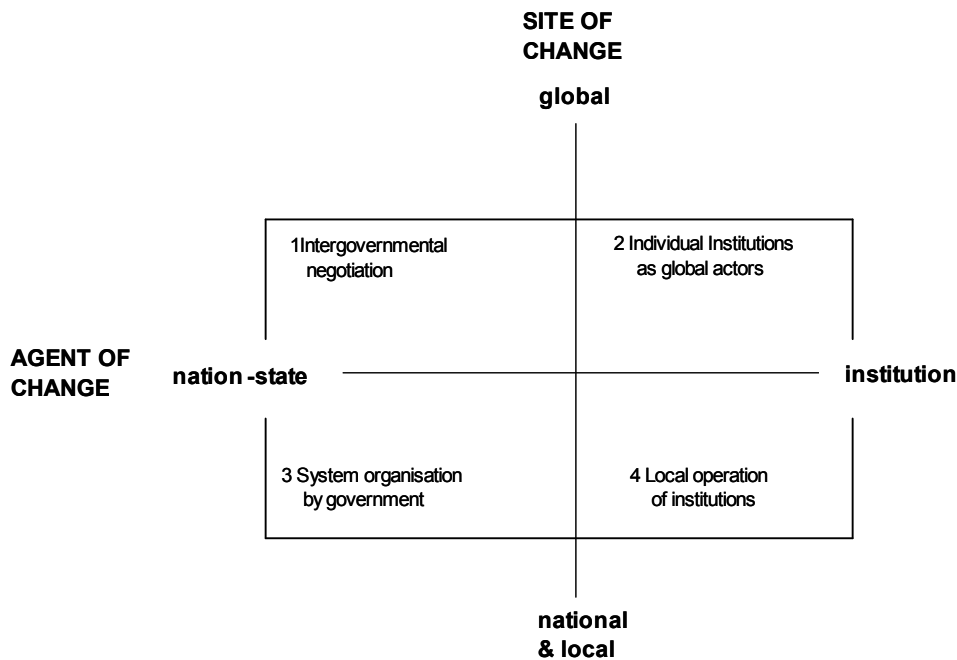
The paper now provides an overview of the factors shaping the position of national higher education systems, and individual institutions, within the world-wide landscape.

6. The global potential of nations and institutions

In the worldwide higher education landscape there is a new configuration of policy space. Figure 1 identifies four distinct but overlapping zones in which strategies and policies are formed, by governments, institutions and both. These are inter-governmental negotiations (quadrant 1 top left), institutions’ global dealings (2 top right), national system setting by governments (3 bottom left), and local institutional agendas (4 bottom right). Two decades ago nearly all the action was in the bottom half of the diagram. That is no longer the case.

global strategy making has become important to many nations and institutions. Here they share the global higher education landscape with international and regional agencies, educational corporations, non-government organisations, and other groups and individuals with an active interest in cross-border relationships. Within the global higher education landscape, nations and institutions are both ‘positioned’ and ‘position-taking’ (Bourdieu, 1993). Nations and institutions are positioned by their inherited geographies, histories, economies, politics and cultures, including their education and research systems. In the longer term nations and institutions can augment their global capacity in most areas by their own efforts. In the short term they must make do with what they have. Nevertheless there is much scope for imaginative strategy and for capacity building that will open up future strategic options. There are a host of possible networks and other global strategic permutations.

Figure 1. Four zones of strategy making by nations and higher education institutions



For governments and globally active institutions, there are two related objectives of global strategy: (1) to maximise capacity and performance within the global landscape, and (2) to optimise the benefits of global flows, linkages and offshore operations back home in the national and local settings. The achievement of these policy objectives depends on a realistic understanding of the global landscape, of the location of nation and institution within it, and of the possibilities for strategy. It also rests on the potential and capacity of system and institutions to operate in cross-border settings, and the degree of effective global engagement.

At the same time the two dimensional diagram can only tell part of the story. This worldwide higher education landscape is continually moving; and it is also a relational landscape. It is a continually changing network of national systems and of individual institutions. Here, while nearly all national systems and research universities are in communication with many others, it is not on a basis of equivalence or equality. Those nations and systems are differentially positioned within the landscape. Existing competitive advantage/ disadvantage changes only slowly.

In sum, the global potential of nations and institutions is shaped by two broad factors: capacity, and meta-strategy.

The capacity of each national system and each institution is shaped by the following seven elements. The first two are givens, the last five are open to policy intervention:

- The inherited educational traditions, language and culture distinctive to each (*history*);

- Location and size (*geography and scale*). All else being equal size constitutes advantages, though smaller nations such as Singapore, Finland and Switzerland have developed effective global strategies;
- Income, investment and assets, for example as measured by GDP and GDP per head, or by national investment in education and research (*material resources*);
- Capacity in English language which has become the principal language of exchange in education, research and communications, as well as educational trade (*global language power*)
- Research capacity, which is partly shaped by history, geography and scale, partly a function of investment and of language power, and affected also by less tangible cultural factors such as the will and the freedom to create (*knowledge power*)
- Effective synergies between higher education and research, government policies, industry and above all, evolving global cities (*knowledge economy concentrations*);
- The degree of effective cross-border activity, including two-way flows of people, ideas, knowledge, technologies and capital in higher education and research; and the willingness and capacity to take initiatives in cross-border matters (*global engagement*).

The three elements of meta-strategy, which are also open to self-determining change, are as follows:

- The policies, programs and modus operandi of the *nation-state*;
- *Openness* to the global, combined with
- The nation's/institution's sense of *identity*, of own strategic project.

The eight elements that are open to policy intervention will now be considered in turn.

Elements of global capacity

Material resources: Within the OECD group of countries total GDP varies from USD \$12,409.5 billion in the United States to USD \$10.5 billion in Iceland. Gross National Income per head, a rough measure of wealth intensity within each nation, varies from USD \$41,950 in the United States to a low of USD \$8,420 in Turkey (OECD, 2006) National and institutional capacity to operate globally is also shaped by such factors as the communications infrastructure sustaining global connectivity; the qualities of the steering instruments used by government, organizational cultures and incentives within institutions; the subsidies allocated to cross-border programmes such as research training, academic visits and research collaborations; the entrepreneurial spirit in institutions; the character of institutional autonomy and academic freedom, which are necessary conditions for identifying and maximizing the full range of global opportunities. The level and type of national funding is crucial, particularly in basic research which cannot be sustained by market forces and depends on the public funding of academically-determined priorities. Within the OECD there is much variation in investment in tertiary education, from 2.6 per cent of GDP in the USA to 0.8 per cent in the Slovak Republic (OECD, 2006).

Global language power: Many students from non English-speaking nations want to acquire English and degrees from English-speaking systems, while comparatively few English-speaking students want to acquire other languages and degrees from non English-speaking nations. The driver here is the vertical patterning of language and degree status. English is the premier language of business and the professions and the only global language of science, research and academic publication. The erstwhile world-wide roles of Latin, French, German and Russian have declined. French remains important in Francophone Africa, and German continues to be quite widely known in university circles in Japan and Korea; Arabic is a common medium of academic discussion in many nations; and Spanish an

important regional language in Central and South America with a growing importance in the United States; nevertheless, in an increasing number of institutions throughout the world faculty have formal or informal incentives to publish in Anglophone journals. 'It is English that stands at the very centre of the global knowledge system. It has become the lingua franca par excellence and continues to entrench that dominance in a self-reinforcing process' (Held et al., 1999, p. 346; Crystal, 2003). The global academic role of English is as much driven by the weight of the Anglo-American bloc within the world economy, the cultural industries and the Internet, as by specific developments in higher education. The special status of English extends beyond the language itself to the works generated in it. Books prepared originally in English are much more likely to be translated into other languages than the other way round (Held et al., 1999, p. 346). Because knowledge conceived and discussed in English enjoys a privileged status vis-à-vis all other knowledge, much academic work of great social and scientific importance, originating in languages other than English, is excluded from the common global knowledge circuits, with incalculable consequences for economic and social development and for human rights. This is especially serious in relation to the study of society and the humanities, given the global impacts of works in French, German and Spanish (to name only three European languages) in the modern era alone; and other long-standing traditions such as those of China, Japan and the Arabic-speaking nations.

English is also spreading as a medium of instruction in non English-speaking nations, particularly in programmes designed to attract foreign students. It is widely used in India and the Philippines, and in Singapore and Hong Kong China, which in the past were colonized by English-speaking nations. In Malaysia, it has been reintroduced in the school sector and is dominant in the growing private tertiary college sector. It is also in growing use as a medium of instruction in the education export industry in China. Within Europe, English is increasingly used as the language of instruction in selected programmes, especially at Masters level and those targeting students from Asia. Nations where English is widely used include the Netherlands, Finland, Iceland, Sweden and Denmark, and also Singapore and Hong Kong China. German institutions are also extending the facility to prepare doctoral theses in English, and Japan provides about 80 English language programmes (OECD, 2005c, p. 255), but the spread of English as a medium of instruction and/or examination is more significant in the smaller European nations. As a second language English is much more widely used throughout the academic world. At the same time English is itself becoming more diverse, with distinctive 'Englishes' inflected by local language and culture, especially in Asian nations, though whether this finds its way into the research literature remains to be seen.

Global knowledge power: The distribution of research capacity world-wide is highly stratified. Of the leading 500 research universities in 2006, as measured by Shanghai Jiao Tong University, the USA had 167. Other major systems were the UK (43), Germany (40), Japan (32), Italy (23), Canada (22), France (21), China (19), Australia (16), the Netherlands (12) and Sweden (11). Only 21 of the top 500 universities were in nations where per capita GDP is below the 2005 global average of \$9420 (World Bank, 2006): 14 in mainland China, excluding Hong Kong, four in Brazil, two in India and one in Egypt. The centralization and concentration of research capacity is greatest at the top. All but seven of the top 100 research universities were in nations with per capita incomes of over \$15,000 in 2005. The USA dominated with 54, including 17 of the top 20. The UK had 11 of the top 100, including Cambridge and Oxford in the top 20; the English speaking countries between them commanded 71 per cent. The relatively small national systems of Switzerland (four) and Sweden (three) are strong in the top 100 group. Canada, France and the Netherlands were in the top 50.

Of the HiCi researchers in the top 250-300 in their fields, 3835 are located in the USA, almost nine times the number in any other country. The UK has 443, Japan 246, Germany 242, Canada 174, France 157, Australia 102, Switzerland 102 and the Netherlands 92. In the U.S. Harvard has 160 HiCi researchers, more than all French universities put together,

Stanford 135 and UC Berkeley 82. There are 44 at Cambridge in the UK. There are 14 in Hong Kong and four more in mainland China, as well as six in Taiwan China (ISI-Thomson, 2007). Where research capacity is concentrated, there knowledge flows are generated. In 2001 scientists and social scientists in the United States published 200,870 papers in recognised international journals, almost a third of world output, and the United States 'accounted for 44 per cent of citations in the world scientific literature' (Vincent-Lancrin, 2006, p. 16). The volume of the papers from Japan was 57,420, the United Kingdom 47,660, Germany 43,623 and France 31,317. By contrast, in Indonesia, a middle level developing nation with two thirds of the population of the United States, there were 207 papers. There were 11,076 papers from India and 20,978 from China in 2001 (NSB, 2006). In 2001, OECD Europe excluding the United Kingdom published 29.4 per cent of the world's scientific papers in 2001, compared to 44.6 per cent in the English-speaking countries.

Knowledge economy concentrations: Strong global concentrations of knowledge power are typically supported by government programs and regulation, synergise effectively with industry and communications, and are able to draw and hold talented people from all over the world. The most favourable environment is a major global city that is a transport and communications hub and is characterized by scale, adequate infrastructure, and preferably also attractiveness as a place to live, such as New York, Seattle and Los Angeles, London, Paris, Berlin, Tokyo, Beijing and Shanghai. Not every global city is a leading node of education and research; and not every major concentration of research capacity is supported by a global city, but over time the correlation is likely to intensify.

Global engagement: Global engagement in higher education, both quantity and directionality can be partly measured by the flow of people across borders. First, there is student movement within the global market in cross-border degrees. The OECD notes that in 2004, 2.7 million students enrolled outside the country of citizenship, compared to 1.9 million in 2000. Global competition in degree courses is centred on the movement of Asian students to the Anglophone zone and Western Europe. Of the 2.7 million students in 2004 just over half were from Asian nations, including 381,330 (14.4 per cent) from China and 129,627 (4.9 per cent) from India. A further almost one quarter of all cross-border student movement took place between European countries. The English language nations are the leading exporters, commanding almost half of the world-wide total (46.8 per cent) between them. In 2004 the number one destination country was the United States with 572,509 students, 21.6 per cent of the total. The UK had 300,056 students and Australia 166,955. France (237,587) plays a special export role in relation to Francophone Africa, led by Morocco and Algeria. The other large exporter is Germany (260,314). Asian source countries constitute four of the five largest importers. As well as China, India, Korea (98,103) and Japan (61,437), importers include Malaysia (42,054), Hong Kong China (36,186), Indonesia (33,877), Thailand (24,677), Singapore (21,163) and Vietnam (17,089). These students are mostly self-financed, with the exception of those at doctoral level. In much of Asia private investment habits are entrenched.

Second, there is the world-wide doctoral market and the pattern of post-doctoral movement. Doctoral education is dominated by the special global role of the United States and constitutes the first unitary global market in higher education. This arises from the concentration of much of the world capacity in basic research in the United States, and a deliberate U.S. policy of opening U.S. universities to foreign talent. The American doctoral market functions as the global doctoral market.

The USA places a high priority on the input of foreign talent at doctoral level. In the USA in 2004-2005, 18.1 per cent of all foreign students in higher education were at doctoral level and 30.8 per cent in research-intensive universities. Almost three quarters of these students received scholarships or other subsidies, mostly from their American universities (IIE, 2006). The foreign-born proportion among doctoral graduates rose from 13.5 to 28.3 per cent between 1977 and 1997. In mathematics and computing it rose from 20.2 to 43.9 per cent, in engineering 32.1 to 45.8 per cent (Guellec and Cervantes 2002, pp. 77-78). During

their studies foreign students make a key contribution to American universities as research and/or graduate teaching assistants. Between 1985 and 1996 the number of foreign students primarily supported as research assistants rose from 2000 to 7600 (Guellec and Cervantes 2002, p. 89). Later the U.S. immigration regime places a Green Card within reach. Growth in the number of foreign doctoral students and their share of American PhDs has been matched by the growth in their propensity to stay. From 1987 to 2001 the stay rate for foreign doctoral graduates rose from 49 to 71 per cent (OECD 2004c, p. 159). Stay rates are particularly high for doctoral graduates from China, India, Israel, Argentina, Peru, Eastern Europe and Iran; and also for some developed countries including the UK, Canada, New Zealand and Germany. In 2003 three quarters of EU citizens who obtained a US doctorate said they had no plans to return to Europe (Tremblay, 2005, p. 208). Not all foreign PhDs go on to work in higher education but between 1975 and 2001 there was a sharp rise in the foreign born with US doctoral degrees as a proportion of academic labour, from 12 to 21 per cent. American universities are more flexible and open than the academic labour markets of most other nations. At postdoctoral stage the USA offers the majority of posts worldwide. An increasing proportion of postdoctoral personnel holding US doctoral degrees are foreign born: between 1985 and 2001 it rose from 21 to 41 per cent (NSB, 2006, pp. A5-47).

Third, there is the pattern of visiting faculty. The USA, followed by the UK, draws the most visiting faculty. In the USA between 1994-1994 and 2004-2005 the number of international scholar visitors rose from 59,981 to 89,634 (49.0 per cent) (IIE, 2006); though, like the foreign student intake, it faltered temporarily after 11 September 2001. Within Europe the main receiving countries for researchers are the UK (30 per cent), France (15 per cent), Germany (13 per cent) and the Netherlands (10 per cent) (Luitjen-Lub et al., 2005, p. 157).

Elements of global meta-strategy

Nation-state: The salience of government in global capacity is manifest in many respects; in regulation and in the instruments of administration and system steering, in the policy culture, and above all in material investment. In the USA federal government research funding are crucial to both the public and private universities. Public investment is the driver of change in China and Singapore and the mainstay of European research strength. Though the dynamics of global competition can only be modified by policies coordinated across borders; that is, global public goods; all nations have partial autonomy and scope for self-determination in the global setting (though the larger and wealthier nations, and universities, have more independent agency freedom than others). The effects of global competition in national systems in part can be modified by national government actions. By investing in global competence and strategies, nations and institutions are able to expand the range of possibilities. In essence, the more that global and national developments are driven by endogenous market competition in the sector, the more the outcomes of that competition will intensify the prior hierarchy of institutions and nations; and the less likely that new concentrations of research capacity and educational status will appear. For emerging nations in higher education, targeted public investment is the circuit breaker.

In general, developed nations have a superior capacity to access both global private and global public goods in higher education. They contain more people with the ability to pay for global private goods as foreign degrees or commercial intellectual property. They also have research infrastructures and trained personnel able to turn the public goods created by research into both more basic research, and technology transfer. In contrast, less developed nations benefit more from global public goods than global private goods. Higher education and research are integral to nation-building and to modernizing strategies able to secure purchase in the global setting. Imports can make their optimum contribution to national capacity building when domestic infrastructure is already strong, the national innovation system is a magnet for diasporic investment, and the nation maximizes 'brain return', as in

Korea and Taiwan, making better use of its foreign-trained nationals. However in less developed nations, the cross-border education of nationals in the market for private positional goods is associated with brain drain, while PhD graduates who return often lack opportunities to work in their area of training. Cross-border education is less valuable to those nations than growth in higher education capacity at home. This, more than foreign education augments the pool of professional skills and the capacity of national research and knowledge systems, creating multiple long-term potential for national private and public goods.

Openness: To maximise strategic effectiveness in the global environment, on one hand it is essential to retain a strong sense of identity and purpose; on the other hand it is essential to be open to and engaged with others. Both sides of this coupling are equally important.

To be effective in the global environment, especially in nations without American advantages, means being prepared to change. Global exchange is transformative and all policies and institutional habits are ripe for reconsideration in the light of the global challenge. It is important to be flexible about the policy mechanisms and not allow these to become hardened into policy dogmas, or too much path dependency at the institutional level. Governments in many nations are wrestling with the question of whether competition at home improves competitiveness abroad, and which combination of competition with collaboration will deliver the best results outside the border. At the regional level Europe is preoccupied with the same question. But there is no one solution that is always correct for every case. These policy ‘dilemmas’ are ultimately more apparent than real, and more in the realm of policy discourses than in the real world policy mechanisms. Though from time to time ideology is comforting, what matters is what works. No doubt some cross-border activities of institutions need to be brought into the domain of national policy, while at the same time systems and institutions with a history of insularity or dependence need to become more autonomous, open and proactive to be globally effective. How they become engaged is a more open matter. The how is less important than the outcome. On some occasions deregulation serves; sometimes state investment in expanded capacity, and sometimes both are needed. The more difficult question is to devise coherent means of coordinating institutions with a sufficiently light touch so as to progress their autonomous global capacities while achieving the common strategic purpose.

Sustaining an evolving national (and institutional) identity includes a clear sense of the contribution of the nation (or institution) to the larger global environment, including global public goods. In the last ten years China’s material achievement in higher education and research has been remarkable. But the necessary corollary of this process of material accumulation and people capacity building is the sense of national/global mission that permeates Chinese higher education. As Zhang Xiaoming and Xu Haitao (2000) put it: ‘many non-western societies are trying to evaluate themselves with western standards and then develop what they lack. The time seems ripe for change with regard to such an unwise approach’ (p. 103). Internationalization should emphasize ‘not the elimination of cultural differences but international exchange on an equal footing’ (p. 104). Differences in national power inevitably results in inequalities; but ‘no route to development, autonomy and power can be separated from international systems’ (p. 110). Open participation in the global dimension is essential. At the same time maintaining a strong sense of national tradition and national strategic project is equally essential. In the face of cross-border flows the national project should be not be one of adaptation to global normalization and standardization, but rather one of ‘indigenization’, whereby foreign culture is ‘grafted onto the tree of indigenous culture’ (p. 104).

7. The changing global strategic environment

The paper will now reflect on how these elements of global capacity and strategy play out in the actually existing global higher education landscapes.

Role of the United States

As the preceding data suggest the USA plays a special and dominant role in world-wide higher education that far exceeds that of the other high-GDP nations. The instrumental strength of the United States in higher education is massive compared to all other systems. There are a number of reasons for this. First, scale. The USA has the third largest population and the largest GDP. Second, wealth: the USA has a GDP per head of almost \$42,000 USD. Third, it spends the highest proportion of GDP on tertiary education, 2.9 per cent, about \$360 billion in 2005. The next largest spender is Japan at \$51 billion. The United States invests seven times as much on tertiary education as the next nation. Fourth, as noted there is the pattern of research capacity concentration and knowledge flows. Fifth, the USA benefits from the global role of English. Sixth, there is the power of American research universities as attractors of global talent. Seventh, American universities are the global hub of the communicative environment. Institutions in all world regions have partial linkages with other regions but routinely link to US universities (Castells, 2001). US scholars dominate journal editing. Finally, there is the primarily American content of the leading norms of university and system organisation. Through much of the world, and in the international agencies, the policy imagination is infused with two models of institution: the high status not-for-profit private research-intensive university; selective, a magnet for donors and focused on research and graduate education (the Ivy League); and the other is the for-profit vocational institution with broad-based training in business studies and perhaps technologies, health and education; expansionary, spare and efficient, 'customer-focused' without research (the University of Phoenix). These models are not necessarily appropriate to all nations. Around the world they confront very diverse national systems and institutions that do not fit the models, such as the participatory universities of Latin American that take in a large slice of national economic, social, political and cultural life (e.g. the University of Buenos Aires and UNAM in Mexico); the German *Fachhochschulen* and high quality vocational sectors in Finland and Switzerland; the research institutes in France and Germany. But their influence is undeniable.

More generally, one reason why American higher education is so globally successful is its particular combination of decentralization and centralization. Its institutions are engaged in many unregulated exchanges with institutions throughout the world, maximizing the scope for American initiative and influence, and minimizing the capacity of other nations to restrain them by inter-governmental negotiation. But American higher education is more coordinated than it might appear. The institutions share a resilient common culture, and a sense of national project and American way of doing, that binds them to each other without much direction.

Newer developments

However the world-wide higher education landscape is changing rapidly and there is no reason to think that the present patterns will become fixed in perpetuity. The global order is more unstable, more changeable, than national hierarchies. The development of capacity in the emerging nations, especially research capacity, has the potential to modify the pattern of global asymmetries and uni-directional transformation. One example is the European Union. There collaboration could alter the global picture given the research strength of several West European nations. Though it remains to be seen how those separated strengths will coordinate and accumulate, the Bologna declaration and the European Research Area provide favourable conditions for the concentration of capacity (Marginson and van der Wende, 2007).

However, the more striking development is the rise of new science powers in East and Southeast Asia. Between 1988 and 2001 the number of scientific papers increased sharply in Korea (1332 per cent), Singapore (535 per cent), Taiwan (472 per cent) and China (354 per cent) (NSB, 2006). In China investment in research and development has doubled in ten years

as a proportion of GDP, rising from 0.57 to 1.35 per cent from 1996 to 2005 (OECD, 2007). From 2003 to 2007 the number of universities from China in the Jiao Tong top 500 rose from 18 to 25, with the number of mainland universities rising from 8 to 14 (SJTUIHE, 2007).

Singapore shows that an emerging nation can not only reverse the brain drain but can transform the global role of the nation by investing in globally focused education and research. The National University of Singapore might become one of the world's leading universities. China is rapidly creating a layer of top research universities. Research capacity in Hong Kong and China Taiwan is at European levels. The long start of U.S. research universities, their control of the material means (research infrastructure, electronic publishing, journal production), and their capacity to co-opt foreign talent via hirings and collaboration, ensures their leadership of global knowledge flows for the foreseeable future. However, it is likely that an increasing number of researchers and scholars will move back and forth between systems during their careers and many will hold joint appointments; so that increasingly the American doctoral and post-doctoral experience will feed into capacity building back home, and more nations will build research systems capable of self-reproduction. Greater mobility and pluralization of research capacity opens the way to a partial pluralization of global status and in the longer term, the evolution of a more plural set of models and norms of institution in a more cosmopolitan higher education.

Plurality of global languages?

The development of new powers in higher education and research is likely to become associated also with a greater pluralization of language use, though only some national traditions will benefit from this. At present English is only one of the world-wide languages spoken by one billion people. The other is Putonghua ('Mandarin' Chinese). Two pairings of related and mutually intelligible languages are spoken by more than half a billion people: Hindi/Urdu, and Spanish/Portuguese. Another three languages are spoken over 200 million people: Russian, Bengali and Arabic. Another four languages have more than 100 million speakers. These languages are too large to disappear; and if China develops Putonghua as a language of scientific research it is likely that it will become globally significant. If regionalization looms larger, some world regions (Latin America, nations using Arabic, perhaps East and Southeast Asia, and Francophone Africa) may assume a distinctive linguistic base, with one other language being used alongside English as a medium of exchange and marker of identity. On the other hand it is possible that English will stay dominant in the sciences while greater global plurality develops in the social sciences and humanities.

8. The common global implications

The global dimension of higher education and research is a changing relational space that intersects with and feeds back into and from the national and local dimensions. Global flows of people, ideas, knowledge, messages, technologies and capital are uneven and only partly reciprocal but are growing, in many places are ubiquitous and are continually transformative. In the global setting nations become global citizen-states, retaining partial control over their own projects while to a varying extent open to global effects. The global potential of individual nations and institutions, variable and only partly under their own control (again, the extent of independent self-determination is itself variable) is shaped by seven elements of capacity (history, geography and scale, material resources, language power, knowledge power, knowledge economy concentrations, and global agency) and also three elements of meta-strategy (nation-state, openness to the global, sense of own self-controlled project).

In summary, six conclusions can be drawn from the above analysis.

First, the character of research and the distribution of research capacity are the most crucial elements in determining both the nature of the world-wide environment in higher

education, and the potential of individual nations and institutions within it. For example it is changes in this area, particularly the rise of new science powers in Asia, that foreshadow a pluralization of knowledge economy power and of patterns of language use. The pluralization of research knowledge is important in opening up the potential for a more cooperative and 'horizontal' map of power in worldwide higher education and research, which in turn will affect many other areas of the relationship between nations.

Second, in a higher education world with one dominant national system and many others, the regional (cross-national) level of organization takes on a special importance. European-level cooperation might have the potential to aggregate the strengths of diverse research universities across the continent, and the already high level of student mobility is reshaping European industry and the professions in the longer term. Cooperation in the Southern Cone of the Americas also creates spill-overs via student and staff exchange and research cooperation, and could help to augment the global position of the Spanish language. Regionalism in East, Southeast and South Asia is under-developed, in higher education and other spheres, but the ASEAN nations have some cooperative schemes.

Third, education and research in one country can affect others. These cross-border externalities can be positive (for example the flow of information, ideas, knowledge and short-term people movement) or negative (for example 'brain drain'). However, in policy making there is little recognition of these externalities at both national and multilateral levels. In relation to cross-border matters, the principal focus so far has been on the trading aspects rather than public goods.

Fourth, this in turn has led to multilateral neglect of the need for capacity building in the developing world. Cross-border imports are not sufficient in themselves to constitute an effective strategy of capacity building in emerging economies. Building national capacity is the most important single element, in particular building research capacity.

Five, the ultimate measure of the global worth of higher education and research – above and beyond their contribution to particular nations and regions – lies in their contribution to the common human story, and particularly to the solution of the major problems facing people in all countries – climate transformation and global warming; the need for secure supplies of water and food; energy and its more efficient and ecological harvesting and use; infrastructures; world-wide pandemics and other health issues; and poverty and illiteracy. The ultimate question in this sector, as in all others, is the future world order, the extent to which real global inter-dependence is reflected in the governance and cultural arrangements. Higher education and research carry much of the future potential of humanity and their benefits are maximized when they flow freely across the world. Nevertheless higher education and research will remain nested in national policy settings for the foreseeable future, and must meet national and local goals as well as making a global contribution. The capacity of its systems and institutions to operate effectively in the global, national and local dimensions at the same time will determine whether it fulfills its potentials.

This higher education setting posed an unprecedented challenge to both national policy and multilateral decision-making. It calls for a new level of complexity of thinking, and of multiplicity of commitment and engagement. And the stakes are high. Higher education and research have unprecedented opportunities to do good in the world.

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