

CHAPTER 2

Entrepreneurial universities in global innovation ecology

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Introduction

Universities are facing various challenges that affect the preconditions of their organisation and role in society. One of the most pervasive megatrends, globalisation, is a kind of overall framework as a 'last phase of modernisation' that transforms both the material and cognitive dimensions of our lives. Another equally important megatrend is informatisation, which relates to the acceleration of knowledge processes in which the role of digitisation has been decisive. The challenge to universities is to understand the nature and dynamics of on-going transformation and on the basis of such an understanding to respond to its two fundamental dimensions: global-local and real-virtual dialectics. One of the practical issues as a part of this agenda is to define the role of universities in global innovation networks and in a wider innovation ecosystem, as their relevance will increase due to globalisation and informatisation. At the intersection of these transformations two important aspects of development will emerge, which are likely to affect the prerequisites of the success of universities in the future: networking logic and innovation intensity.

There are already developments that foreshadow the university-level responses to the abovementioned changes. Many universities are becoming increasingly entrepreneurial in the sense that they strive for commercialising their research, attracting talent and students globally, establishing overseas affiliations and cam-

pushes, and participating in alliances and innovation networks on a global scale. The preconditions for required strategic actions and positioning vary from one country to another, and from one university to another, which in the long run may increase not only specialisation among universities but also disparities between them. Clark (2001, 147), for example, has estimated that increase in entrepreneurial responses in academic life makes universities more individualised. Yet, at the same time we may assume that there will be some degree of convergence especially among research universities towards entrepreneurial university model due to the conditioning logic of global capitalism. There is no logical contradiction here, for it may be that the underlying capitalist logic increases certain kind of convergence especially among the top universities which according to rankings belong to the highest apex of global university hierarchy, whereas as a whole the higher education institutions are increasingly differentiating and diversifying their offerings to knowledge and education markets due to the requirements of the underlying logic of global capitalism. Depending of how the national contexts develop and how universities are treated within public policy frameworks in each context, such a development may lead to increased disparities and hypothetically even to a kind of educational Darwinism.

This chapter is based on a contextual analysis of university transformation, with special reference to the impact of globalisation and related pressure to position universities in global innovation ecology. The starting point is Castellsian analysis of informational economy and the process of globalisation. One practical response to the opportunities and challenges of this tensional field is expressed in the concept of entrepreneurial university. The main argument is that in order to remain attractive and maintain or expand their resource base in the global competitive arena, universities need to learn to take a strategic view of the preconditions for their transformations which go beyond local or national perspectives on this matter. While this concept provides a philosophical basis for reshaping universities and a range of practical tools they may utilise in improving their daily work, it also poses a huge management challenge, including such practical areas as organisation of innovation services, managing stakeholder relations, and making decisions on internationalisation strategies. Let us discuss next what these opportunities and challenges mean at the university level.

Changing global scene

Globalisation is a gradual macro-level structuration of world order which implies a development towards dynamic world-scale interdependency (cf. Robertson, 1990). In such a process real exchange and interactive relations and people's orientation bases become global and consequently boundary-eroding as they crumble institutional boundaries of territorial communities. This, in turn, is why globalisation is dramatically changing the context of institutions and communities, including higher education institutions.

New economy is inherently global. It emerged in the last three decades on a worldwide scale, a phenomenon which Castells (1999, 66, 92) characterises as both 'informational' and 'global' in order to identify its fundamental distinctive features and to emphasise their interrelationship. New economy is '*informational*' because of the critical role of the capacity of economic actors to generate, process and apply new knowledge to productivity and competitiveness, and it is '*global*' because the core activities of production, consumption and circulation and their components – capital, labour, raw materials, management, technology, markets etc. – are organised on a global scale. This development has several manifestations. Capital is managed around the clock in globally integrated financial markets. Labour markets are global in two ways: there is a growing segment of professionals and experts and managers which is genuinely global in nature, but more importantly, even more place-bound labour is basically a global resource. Science and technology are also organised in global flows, albeit in an asymmetrical structure – as expressed in the idea of spikiness of a flat borderless world (cf. Florida, 2005). Markets for goods and services are also increasingly globalised, meaning that strategic aim of firms is to sell wherever they can throughout the world, in which the facilitating role of information and communication technologies (ICTs) and new transportation technologies is crucial. Lastly, the management of production and distribution and the organisation of production process itself are also increasingly organised worldwide. (Castells, 1999, 93–96.)

It is generally held that globalisation increases efficiency in the utilisation of scarce resources by competition and the global division of labour. On the other hand, global competition also causes various side-effects and risks. Castells (1999) claims that the networks of instrumental exchanges selectively switch on and off individuals, groups, regions, and even countries, according to their relevance in fulfilling the goals processed in the networks dominated by multinational corporations. This leads to a fundamental social tension between universal instrumentalism guided by corporate interests and historically rooted identities of people and their communities.

Globalisation also has a profound impact on public policy and the governance of polities. According to Douglas (2002, 56–58), hyper-competition may reduce overall welfare in local communities, lead to oversupply of infrastructure and some services, increase the social and economic costs of relocation, and strengthen the tendency for resource-depleting developmentalism. Governments' preoccupation with attraction-oriented development policy may divert attention away from the social and environmental concerns of the local communities (Logan, 1999). Here the connection to the realities of universities is apparent. This challenge translates into the question whether the entrepreneurial university or even the corporate university is the future model for universities, or whether we are in the process of 'republicising' universities (Rhoades & Slaughter, 2004) or reinventing civic universities with a civic duty to engage public research universities with society at large on local, national and global scales, thereby linking the social and economic spheres (Goddard, 2009; Cherwitz, 2010).

To conclude, due to increased cross-boundary flows of resources universities have become more concerned with global development than they have ever been before. The internationalisation of universities is reaching new heights, its advanced phase associated usually with 'globalisation' (Bartell, 2003; Mok, 2007; Nokkala, 2007). In a way, in the age of globalisation our institutions of higher education are becoming *networked universities* – be their philosophical background in the idea of entrepreneurial university or that of civic university – their strategic task being to network globally and to adjust to or to counterbalance the pervasive global trends. They may do this by increasing their competitiveness and/or by trying to affect the overall context within which this competition takes place, the former representing a kind of adjustment strategy or competition strategy and the latter referring to a more socially oriented strategy based on institutional cooperation and solidarity. As it is difficult to change the rules of the game in the name of solidarity, equality or other progressive universal values, the primary focus at university level seems to be on adjustment to global conditions and seizing emerging opportunities, which tends to increase inter-university competition.

Universities in a global knowledge space

Universities have always been interlinked with their surrounding societies. One of the turning points in their development was the Industrial Revolution, which slo-

wly changed the role of the university in society. As a part of this process teaching also started to give way to specialised research, which occurred fairly late, in many European universities only after World War II. A natural continuation of this evolution was increasing discussion of the “third task” of universities, which assumes that universities bring about direct positive changes to society besides teaching and research. An approach that radicalises this development is the view of university as entrepreneurial, capable of commercialising its research and less dependent on government in both regulatory terms and resource-wise.

Such a trend can be seen as a result of neo-liberal policy, even if we may also seek explanation from the hard facts of the post-war period of reduced government support for universities, to which universities have responded by increasing external funding, setting up collaborative research projects and developing innovative working methods. It is also important to keep in mind that in many research areas connected with economic growth sectors and industries – such as information and communication technology, biotechnology and green technology – new opportunities arose in the form of private funding and university-business collaboration (Leslie et al., 2001, 270). Furthermore, due to various trends in business the relationship of enterprises with universities has changed. Originally business investments in universities were more or less philanthropic donations and occasional inputs on basic research. As corporations started to close down or reduce their own R&D units as a part of their cost-reduction schemes, they began to see universities with new eyes. The basic idea was to achieve efficiency gains by contracting out R&D activities to universities, thus introducing unequivocally commercial interests into university-business collaboration (Nelsen, 2001; see also Powers & McDougall, 2005, 296). Thus, universities did not change only through their internal processes or in relation to the sponsoring government, but also due to changes in business with its new expectations and opportunities.

A new dimension to the discussion of the role of universities emerged when they started to internationalise their activities in the form of international conferences, student exchange, and academic exchange and collaboration programmes. Due to the intensification of such relations and activities on a global scale, it is nowadays referred to as ‘globalisation’, as mentioned earlier (e.g. Nokkala, 2007). There are plenty of manifestations of this trend. The economy is increasingly global as are also research systems. This is why the concept of “stand-alone university” makes less and less sense. Universities, just like most other institutions, must find their role in the networks of global production of knowledge and of research and innovation. There are global research networks in the making in different fields of research, and the fundamental competition between universities concerns their place especially in world-class ‘university clubs’. In this process the Internet is crucial, for it helps to

disseminate the results and achievements of research groups as well as to communicate and collaborate with others irrespective of time and place. (Castells, 2009.) Even if focus in such globally oriented processes are predominantly on education business and various forms of academic collaboration, innovations are entering into the field of internationalised activities too. This is not a surprise due to the reasons described above. Even if universities' role in global innovation networks is still somewhat vague, such connections are in the making in different parts of the world (Mok, 2007).

One example of this development is the Nordic consortiums' government-university-business or Triple Helix collaboration in knowledge, innovation and business in China and India, which has assumed such institutional forms as the Nordic Centre at Fudan University, Shanghai (<http://www.nordiccentre.org/>) and the Nordic Centre in India with a liaison office in Delhi (<http://www.nci.uu.se/>). (Delman & Madsen, 2007). Another trend is expansion to overseas campuses, which has seen a rapid increase during the 2000s. The USA and other Anglophone countries, most notably Australia and the UK, have been most active in establishing overseas branch campuses in developing countries. Yet, the picture is changing slowly as the growth has also occurred on the North-to-North and even the South-to-South axis (Maslen, 2009). Such a process can be interpreted as the selling of the brand value of Western universities with good reputation to the growing Asian markets for higher education (see e.g. Green & Koch, 2009). In order to get their share of such a global boom in higher education business, universities may either rely predominantly on attraction strategy, i.e. attracting students and talent to host country campus, or, as is in the case of internationally-oriented entrepreneurial universities, to supplement this by designing and delivering offerings to growing target markets and by establishing overseas programmes, partnerships, affiliations or even branch campuses, such as Malaysia Campus of the University of Nottingham in Kuala Lumpur, Malaysia. Which ever strategy is chosen – that is, more host-country campus-centred or more internationalised and outward oriented strategy – in both cases the key to the organisational response to such an emerging logic is networking, as it is the main prerequisite for achieving the benefits from collaborative synergy and internationally recognised university brands.

Globalisation of universities is not restricted to attracting students and increasing business tailored to the growing higher education markets. An important dimension of this development is research and innovation, which bring global innovation networks into the picture. Let us discuss briefly the constitutive elements behind this trend. First, as mentioned above, globalisation and informatisation change the premises of academic life just the same way they do with other areas of social life. Second, networking is the fundamental principle of organisation in the global infor-

mation age, as it provides most efficient, flexible and durable form of organisation in technologically developed and increasingly interconnected multi-polar world (Castells 1999; 2000). Third, innovation is becoming the key to economic growth and competitiveness in knowledge-based global economy. Innovation is of special interest of post-industrial countries which cannot compete with low production costs, but rather with novelty of ideas, technological sophistication, and 'systemic' innovations. Universities as institutions of knowledge are inherently involved in national and regional innovation systems, which creates a connection to the very fundamental aspects of knowledge-based economy. The fourth part of this picture is the need of expanding and developing service sector in post-industrial societies, which relates among other things to higher education and research and the chance to 'productise' their output as high value adding services and, where possible, as profitable business. Thus, universities find themselves in the intersection of globalisation as a conditioning factor of interdependence, networking as the key principle of organisation of our time, innovation as the core of the competitiveness and smart growth in knowledge-based economy, and service transformation or 'servitisation' in the broad sense of the word as the fundamental service sector-related trend in post-industrial economies. Especially, if the role of networks is in the global world as critical as hypothesised by Castells (1999; 2004a; 2004b), universities will simply weaken as institutions in the global arena unless they organise their activities increasingly through networks, which at their highest level revolve around clubs of prestigious, high-performing and innovative universities and create connections to both global business and national and international institutions.

In the next sections I will take a look at a particular academic manifestation of the previously described globalisation trend, that of entrepreneurial university. *Entrepreneurial university* is more than anything an approach that connects the university with business and value networks and also makes the university a more business-like organisation, which links it with marketisation and competition trends (Nokkala, 2007, 63). It carries a potential to reshape the universities and to help them to find their place in the global innovation ecology. Yet, by the same token they carry a seed of social conflict or tension as entrepreneurial university may also develop towards business-type enterprise or office hotel of academic entrepreneurs in which the production of knowledge is conditioned by market logic and directed according to short-term business interests to growing higher education markets. This may create, in its extreme, a new form of knowledge-based exploitation or even educational Darwinism with limited interest in basic research, in objective analysis, in emancipatory tendency, and in social implications of science. As there are various

ways of understanding the idea of entrepreneurial university, we may assume that the picture is far from black-and-white, though.

Entrepreneurial university

Development towards academic entrepreneurship paradigm is manifested in discussions about entrepreneurial university (Clark, 2001), entrepreneurial science (Johnston & Edwards, 1987; Etzkowitz, 1998) and academic entrepreneurship (Shane, 2004). Slightly similar concepts include such as innovative university (Resnick & Scott, 2004) and more critically oriented conception of academic capitalism (Slaughter & Leslie, 1997; 2001). Let us take a close look at the entrepreneurial turn in higher education and the dispute over its desirability.

A universal model for universities in the making?

There seems to be a factual development towards entrepreneurial activities, and the commercialisation of university research is a widely used practice in most universities throughout the world (e.g. Bubela & Caulfield, 2010; Drabentstott, 2008; Huggins et al., 2008; O’Shea et al., 2007; Wong et al., 2007; Rasmussen et al., 2006; Jacob et al., 2003; Vickers et al., 2001; Chrisman et al., 1995). In some disciplines, such as electronics, the commercialisation of university research has a statistically positive connection with the start-up of new companies (Bania et al., 1993). In addition, in many disciplines good relationships with business have even boosted the academic careers of the academics involved (Powers & McDougall, 2005, 305).

There are also claims that the involvement of academic units in commercialisation has been misunderstood – including its ethical dimensions. Even if in the 1970s and 1980s such activities were deemed unethical, pioneering projects, for example within the University of California system, were not torpedoed by a unified opposition. The case of Ivor Royston at the University of California, San Diego, who actively participated and gained equity interests in biotech ventures indicates that *“the commercialization of the life sciences played out on a complex moral landscape, one in which organizational imperatives and individual passions and interests, as well as personal and institutional efforts to uphold traditional ideals, shaped events and determined outcomes.”* (Jones, 2009, 844).

Van Looy and others (2004) have ended up claiming that entrepreneurship and academic work are not mutually injurious. Besides, even if the resource dependency view is important in general, finance from business does not make the university, especially at the department level, as dependent on private interests as is usually thought, due to professional ethics and the responsibility of academics to deliver good teaching. Etzkowitz (2003b) has even described research teams as quasi-firms, which do not have direct profit-making motive but operate in any case as firm-like entities. When the number of researchers in the team increases to the level of seven or eight, professors who are leading the group tend to do less research and devote more of their time to managerial tasks, as if they were running a small business. In all, changes in the everyday life of universities are not necessarily as radical as one might assume in light of the apparent trends towards increased dependency on resources provided by the private sector (Leslie et al., 2001, 269–270; see also Van Looy et al., 2004).

Critical interrogations

The transformation towards entrepreneurial university is far from a self-fulfilling prophecy. Many basic aspects of entrepreneurial university – the role of universities in local or regional development, commercialisation activities, the sustainability of technology transfer offices and the dynamism of entrepreneurial university departments – have been challenged on various grounds.

Regarding regional development, Lester (2007) and his research group came to the conclusion that the roles of universities vary considerably depending on the special features of the region, i.e. the technology transfer model is not in every case the best way of seeing the ‘third task’ of the university. More importantly, the impact of the university on regional development takes place in the form of education, on the one hand, and on the other of the provision of discussion forums on technological and social trends. In addition, the utilisation of academic research requires the use of means that are selective and tailored to the innovation needs of the region, which is why it is difficult to provide any generic model for the role of the university as a promoter of regional development (Hussler et al., 2010).

In addition, it is worth remembering that the results of knowledge and technology transfer have often remained modest. For example, instead of genuine entrepreneurship and spin-offs, academic entrepreneurial behaviour is usually channelled to ‘softer’ activities, such as consultancy and commissioned research. (Klofsten & Jones-Evans, 2000; cf. Philpott et al., 2011; Fini et al., 2010.) Cohen and others

(2003) have shown that as a form of knowledge transfer publications, conferences and informal meetings are much more important than, let's say, patents. Moreover, a large part of the entrepreneurial activities set up by academics take place outside the system of technology transfer and immaterial rights managed by the university (Fini et al., 2010). Abrams and others (2009) on the basis of the statistical analysis of American universities observed that only some 1/6 of technology programmes are self-supporting, which casts a shadow over technology transfer offices (on results pointing in the same direction see also Bubela & Caulfield, 2010). Nelsen (2001) concluded even more incisively that the best way of gaining significant income through technology licensing is simply to be lucky!

In their study Tuunainen and Knuutila (2006) came to the conclusion that commercialisation, while infiltrating the universities creates contradictions and tensions, which reflect the fundamental differences between academia and business. Such a contradiction is reflected in the relationship between disciplines and the everyday life of academic work communities (see for example Ylijoki, 2003; cf. Bercovitz & Feldman, 2008; Leslie et al., 2001; Philpott et al., 2011, 7). Researchers have also identified various obstacles that at least delay the diffusion of entrepreneurial thinking to universities. Tuunainen and Knuutila have also challenged the one-dimensional view that entrepreneurial university is some kind of inevitable trend that casts all universities in the same mould (cf. Philpott et al., 2011).

Approaches to the dualism thesis

The *critical HEI paradigm* seems to rest to a large extent on a kind of dualism thesis, which emphasises the special nature of academic research and, consequently, the fundamental difference between academic life and business. On this basis there have been claims that universities should strengthen their public role and try to secure public funding for their activities (Rhoades & Slaughter 2004). An opposite view, which could be called the *academic entrepreneurship paradigm*, views the entire situation differently. The entrepreneurial paradigm, however, has many manifestations, which vary in terms of their stance towards the dualism thesis. The idea of an entrepreneurial university which emphasises non-commercial dimensions and transformational capacity builds a bridge between critical and entrepreneurial approaches (Clark, 2001), whereas the more entrepreneurially-oriented Triple Helix model and the similarly entrepreneurially oriented conceptions emphasise the new roles of universities, the positive impacts of commercialisation, and also the governability of the hybrid forms that emanate from such a development (Etzkowitz, 1998; 2003a; Etzkowitz et al., 2000). A kind

of extreme form of this approach in the academic context is a university concept in which technology transfer, commercialisation and sponsorships are an integral part of the philosophy and practice of the university (Cf. Smilor & Matthews, 2004). Stanford University, for example, has been often used as a representative example of such an orientation. Even if in theorisations of entrepreneurial universities it is usually noted that entrepreneurship is not meant to lead to a narrow-minded idea of 'commercialised' university (e.g. Clark, 2001; Etzkowitz, 2003a, 333), capitalising on knowledge is a natural dimension of their operating principles and practices.

When this trend is taken to its extreme, we end up with the idea of a *corporate university*, which challenges the very idea of public university. Corporate universities are usually educational or training units of large corporations, which provide company-specific training. They flourished especially in the USA, where there is no official definition in law of the term 'university'. One of the best known corporate universities is the Hamburger University operated by McDonald's Corporation in Chicago. (See Schultz, 2005). Corporate universities emerged in the 20th century as a continuation of a workforce education trend that saw the light of day as early as around the 1910s. Instead of coping with the perceived slowness and irrelevance of theoretical learning found in traditional universities, business and industry turned inward and created their own training and development departments. These business units were designed to provide employees with the skills necessary to perform their duties with precision and efficiency. In spite of the variations in the explicit mission of corporate universities, most of them are founded on strategic business practices and an awareness of their responsibility to contribute to the effectiveness and growth of the company they serve. Corporate universities are strategic in that they exist to fulfil the organisation's mission. They are results-oriented because they survive only as long as they can prove their value back to the organisation. (CUE, 2009.)

Besides the training units of large corporations, there are also universities and independent training companies that have created 'corporate university' type institutions. For example, the Dutch-based Network University (TNU) states that it facilitates innovative learning and capacity building for a global network of professionals, students, non-profit organisations, agencies and networks specialising in creating e-tools for education and networking in the field of development. TNU started as a project of the University of Amsterdam, but developed into a foundation which collaborates with various universities, development agencies, NGOs and international education and capacity building institutes. This cooperation has resulted in the development of various projects, such as online courses, workshops and debates, education and communication platforms, evaluations of e-learning initiatives and training seminars. (See the Web site of TNU at <http://www.netuni.nl/tnu/moz/>).

Office hotelling for the academic entrepreneurs?

An additional theoretical aspect to be discussed here is the level of analysis and the way individual, organisational, institutional and structural aspects are weighted in the analysis of the academic entrepreneurship. In this scene *critical HEI paradigm* associated with the theorisations of academic capitalism has a critical social theoretical background, and thus its point of departure is basically a structural analysis explaining how public research universities respond to neoliberal tendencies to treat higher education policy as a subset of economic policy (Slaughter & Leslie, 1997). However, more accurately its approach may be called multi-level analysis, the major focus being on departmental level and, as is the most usual case, on the level of faculty members and professional staff with a tendency to view academics as state-subsidised entrepreneurs (See Slaughter & Leslie, 2001). Leslie and others (2001, 269) conclude this discussion by stating that “the department or ‘unit’ level is the most interesting and is the most important to policy because this is where the production activities, the instruction, the research, and the service of the university, largely are produced.” Nevertheless, analyses of academic capitalism apparently revolve largely around individuals – their time allocation, their external funding, their retirement plans – in different roles (Rhoades & Slaughter, 2004; Ylijoki, 2003).

In contrast to this, Clark (2001) in his groundbreaking theorisation pays more attention to capacity and institution-building. He provides a university-level perspective on creating new practices, seeking to innovate the ways of teaching, research and ‘third task’, and creating preconditions for high transformative capacity. It is the collective entrepreneurial action that makes the difference in Clark’s theorising. His analysis of Warwick, Twente, Strathclyde and other universities point clearly the emphasis on the institutional dimension of entrepreneurialism. Clark’s message is that universities cannot continue to live according to the premises of ‘old autonomy’ with full state support, teaching a few students, and engaging in limited basic research. As universities have to do more with less, which increases imbalance in the environment-university relationship, they simply need to become more entrepreneurial. It helps them to recover the autonomy and to better control their future. Entrepreneurial response is a formula for institutional development that puts academic autonomy on an increasingly self-defined basis by diversified income generation, reduced state-dependency, and the development of new units or spin-offs outside traditional departments (Clark, 2001, 146). His idea of ‘collective entrepreneurship’ is conceptually different from a narrowly defined, business-minded academic entrepreneurship (Clark, 2001, 148).

Expressions of more business-oriented entrepreneurial paradigm, in the form of Triple Helix or similar theorisations, are also institutional as they focus on new roles and institutional relationships of universities (Etzkowitz et al., 2000). Such

approaches are typically also fairly evolutionary, as shown by the analyses of the evolution of Triple Helix models and university-industry linkages, and descriptions of entrepreneurial university from transitional to full-fledged entrepreneurial university (Etzkowitz, 2003a).

What is interesting here is that focus on individual academics tends to be associated with critical analyses of academic entrepreneurship, whereas strong institutional and evolutionary emphasis is more common among proponents of moderate or extreme academic entrepreneurship paradigm. Reason for this seems to be that at the institutional level it is easier to show the “inevitable” transition towards entrepreneurial university. More importantly, these differences reflect variations in perceptions of universities and the role of research on transformation of HEIs, as more actor-oriented critical HEI paradigm tends to provide tools for critical self-understanding and empowerment among academics as well as for ‘republicising’ universities by reaffirming their public purpose and financing (Rhoades & Slaughter, 2004), when compared with institutionally oriented academic entrepreneurship, which is more concerned with institutional transformational capacity, management of complex inter-organisational linkages, and the building of new entrepreneurial culture (Clark, 2001; Etzkowitz et al., 2000).

The entrepreneurial university in global innovation ecology

Smilor and Matthews (2004) described the change of university paradigm in the American point of view such that whereas universities have traditionally been places in which dreams have flourished, new ideas are tested and the limits of our knowledge are extended, in the last twenty years we have witnessed the emergence of a new kind of thinking advocating commercialising such dreams. We are talking about entrepreneurial universities and the ‘internal entrepreneurs’ (or intrapreneurs) or state-supported entrepreneurs within them (Slaughter & Leslie, 2001), who engage in establishing spin-off firms and commercialising scientific research and utilise immaterial rights in the form of patents and technology licensing. Such a development has been the most apparent in the Anglo-American countries, in which there are world-class public and private universities, accumulated private capital and entrepreneurial culture. In practical terms there are three key elements that characterise an entrepreneurial university (Smilor & Matthews, 2004, pp. 114–115):

- (1) the role of the university as the promoter of economic development,

- (2) the organisation of technology transfer and commercialisation, and
- (3) incentive and reward systems that support entrepreneurship.

One of the core activities of an entrepreneurial university is thus the organisation of commercialisation and innovation services (Litan et al., 2007). This is a paradigmatic way of generating income from the knowledge assets of universities, which especially at the highest level of global university hierarchy link them to global innovation ecology. Commercialisation is only one part of this activity field. Namely, often universities also organise science parks or incubators, as in the famous cases of Cambridge Science Park in the UK or Stanford Research Park in California. Many universities around the world have followed suit – especially high-performing universities in East and Southeast Asia (Mok, 2007; Castells, 2009; Anttiroiko, 2004). Beside such entrepreneurial activities, the same approach can be applied to teaching and research as well, as illustrated in Figure 1. This development indicates that emphasis is developing from Clark’s groundbreaking analysis of transformational capacity of entrepreneurial universities towards more concrete value-adding activities, such as technology transfer, commercialisation, university marketing, research collaboration, and spin-off creation.

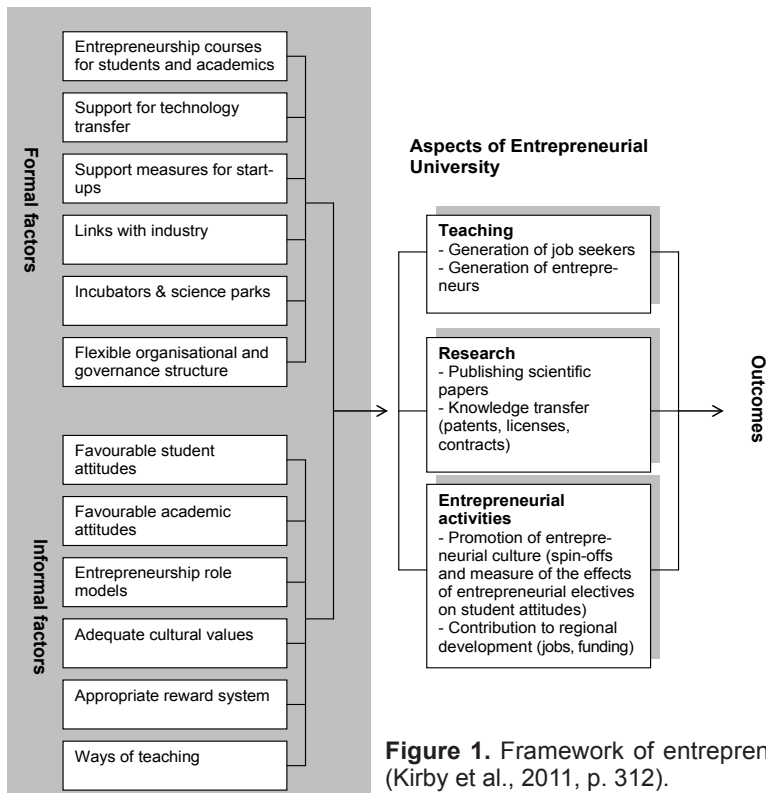


Figure 1. Framework of entrepreneurial university. (Kirby et al., 2011, p. 312).

Entrepreneurial universities are engaged with business and value creation in various ways. A new challenge arises from the globalisation of innovation. It assumes various forms, the three basic ones being: (1) international exploitation of nationally produced innovations, (2) global generation of innovations, and (3) global techno-scientific collaborations (Archibugi & Iammarino, 2002). Both export-oriented efforts and techno-scientific collaborations are important, but currently the most challenging aspect of the globalisation of innovation is 'global generation of innovations', which is usually organised as networks. Such global innovation networks (GINs) as a paradigmatic organisational form of global innovation ecosystem can be defined as *globally organised networks of interconnected and integrated functions and operations by firms and other organisations engaged in the development or diffusion of innovations* (Chaminade, 2009, 12; Plechero & Chaminade, 2010; Chaminade et al., 2010; Komninou, 2008; 2009; Komninou & Sefertzi, 2009). Universities' involvement in the global innovation networking can be divided into two slightly different kinds of network formations: (a) innovation-oriented global research networks or global university alliances, and (b) global innovation networks or multi-stakeholder partnerships which serve primarily business interests. Of course, there are also other forms of involvement in global innovation ecology, such as collaboration with multinational enterprises' R&D units, innovation oriented overseas branch units of universities, and participation in innovation forums and platforms organised by public or private intermediaries or public sector organisations.

There are a few alliances and networks which manifest the globalisation trend depicted above. Some of these are socially or academically, some more commercially oriented. An example of the former is the *Global U8 Consortium* set up by eight universities to meet the growing demand for cross-cultural education, to respond to new challenges posed by the need for global logistics, business models and advanced technologies, and to organise interdisciplinary activities by conducting joint research and expanding outreach programmes (Web site available at <http://www.uri.edu/gu8/>). Another to be mentioned here is the *Global Alliance of Technological Universities*, established in 2009 by seven top technological universities. It aims to address global societal issues to which science and technology could provide solutions. Such issues include biomedicine and health care, sustainability and global environmental change, security of energy, water and food supplies, and changing demographics (See the Web site available at <http://www.globaltechalliance.org/>).

An example of a more business-oriented network is *Global Venture Lab* (GVL), developed 2007–2009 by three professors: Prof. Dhruves Biswas of the Indian Institute of Technology, Kharagpur, Prof. Marko Seppä of the University of Jyväskylä, and Prof. Ikhlaq Sidhu of the University of California, Berkeley. GVL is a

university-based business creation platform. It is, however, more a “method”, than a place or organisation. At the heart of the GVL process is the integration of research, learning, and practice. The idea is to bring business closer to students and research closer to practitioners. The idea is that such an approach enhances the creation of innovative, responsible and sustainable enterprises. In November 2009, more than 20 universities worldwide joined to establish the GVL Network under the leadership of the Center for Entrepreneurship & Technology (CET), UC Berkeley (For further information, see <http://cet.berkeley.edu/global-venture-lab-network-1>).

Conclusion

Universities are institutions that reflect the trends and developments of their host regions and national contexts and increasingly also of the global context. The most pervasive trend in this respect is the emergence of a kind of academic capitalism, which poses challenges to the traditional ‘ivory tower’ culture of universities. Universities are increasingly expected to contribute to the development of society and their host regions or cities, which require more than anything the organisation of technology transfer, commercialisation and innovation services (Smilor & Matthews, 2004). Universities have responded to these challenges in various ways. The emphasis could, for example, be on the development of new teaching methods, setting up international student exchange programmes, organising innovation services, hosting international conferences, participating in global research networks, or establishing partnerships or international branch campuses.

One of the most important aspects of this development relates to universities’ role in knowledge-based economy and innovation processes in particular. Universities are expected to contribute to innovation creation because innovation is the driver of the economy and the most important source of competitiveness in a global economy. This has been articulated in discussions on national and regional innovation systems as well as in Triple Helix theorisation.

There is a range of conceptions that reflect this change. In this chapter I have outlined one of them, entrepreneurial university, which can be seen as a response to abovementioned contextual challenges. The idea of entrepreneurial university has various expressions, which generally relate to the need to increase university’s transformative capacity, to connect the university with business and innovation networks, and to make the university a more business-like organisation. What is essential in this conception is that it reshapes universities’ relationships with stakeholders and

with society as a whole. From the point of view of critical HEI paradigm, such a turn is tensional and questionable, causing various socially harmful consequences, whereas academic entrepreneurship paradigm takes the opposite stance, seeing it as an inevitable turn in higher education. It seems that if universities are expected to reap the benefits from global innovation networks, they need to be entrepreneurial, at least to some extent. Yet, this does not have to be taken to the extreme, that is, to make commercialisation of knowledge universities' primary focus and faculty members entrepreneurs or at least 'intrapreneurs'. Participation in global innovation networks and interaction within global innovation ecology are complex settings, leaving room for both the fulfilment of universities' public role as well as their business-like operations.

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