



EUROPEAN PLATFORM
HIGHER EDUCATION MODERNISATION

UNIVERSITY ENGAGEMENT AND REGIONAL INNOVATION



EUROPEAN CENTRE FOR STRATEGIC
MANAGEMENT OF UNIVERSITIES

UNIVERSITY ENGAGEMENT AND REGIONAL INNOVATION

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**UNIVERSITY ENGAGEMENT
AND REGIONAL INNOVATION**

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TABLE OF CONTENTS

The MODERN project	p. 7
1 Introduction	p. 8
1.1 Universities, the societal compact and regional engagement	p. 8
1.2 The changing societal landscape for higher education	p. 8
2 The irresistible rise of the regional mission	p. 10
2.1 Regional engagement as part of university-society compacts	p. 10
2.2 Research into university-regional engagement: three waves	p. 13
2.3 Understanding the university-regional dynamic	p. 15
3 From a regional mission towards regional innovation	p. 17
3.1 The knowledge society, knowledge capital and innovation	p. 17
3.2 Regional innovation systems	p. 18
3.3 How 'regional' are regional innovation systems?	p. 20
3.4 Regional Innovation Systems as local meeting points for global actors	p. 22
4 Universities as global pipelines driving local economies	p. 25
4.1 A first-stage model of university regional innovation	p. 25
4.2 'Global pipelines, local buzz': universities driving spill-overs	p. 27
4.3 Universities' worlds of stakeholders	p. 28
4.4 Configuring regional innovation to create global-local buzz.	p. 31
4.5 Beyond science parks: regional innovation strategically aligning university and regional assets	p. 33
5 Principles for effective regional innovation	p. 34
5.1 Regional engagement as third mission?	p. 34
5.2 Strategically managing regional innovation activities	p. 35
5.3 Becoming a regionally engaged innovative university	p. 36
Bibliography and Further reading	p. 38

THE MODERN PROJECT

In its recent Europe 2020 strategy, the European Commission emphasised the need to enhance the performance and international attractiveness of Europe's higher education institutions. European higher education institutions need to modernise their governance and train their leaders to operate in increasingly complex sets of interactions at the institutional, regional, national and European level. European policies call for universities to play a strong role in the Lisbon Agenda and in making Europe a strong knowledge-based economy. Although the need to train university leaders is so obvious, the supply of management support to higher education institutions, their leaders and managers is highly fragmented in Europe.

The MODERN project, European Platform Higher Education Modernisation (www.highereducationmanagement.eu), is creating an open platform as a key instrument for innovation, state-of-the-art knowledge, dissemination of good practice and joint action on university leadership, governance and management for the professionalisation of the sector. MODERN contributes to raising awareness in European higher education institutions on the strong need to invest in people, to support potential leaders, and to encourage management training at all levels (junior and senior, academic and administrative staff), with as background the aim to ensure their competitiveness to respond to external challenges.

Under the leadership of ESMU, the European Centre for Strategic Management of Universities, MODERN is a consortium of 10 core and 29 associate partners joining forces through a Structural Network under the EU Lifelong Learning Programme (ERASMUS). All project partners are institutions and associations active in the field of higher education management.

During the three years of the project (2008-2011), MODERN will map the supply of management development programmes and its adequacy to the demand, leading to the creation of a European portfolio of the provision of short and long term training programmes in higher education institutions and European associations.

The present report is the fourth in a series of five thematic reports which are published on key issues related to current priorities in higher education management: governance, funding, internationalisation and quality assurance, regional innovation, and knowledge transfer. All five reports are produced for each MODERN conference on the respective theme. This fourth report provides an overview of the state-of-the-art of university engagement and regional innovation. The report was written by Paul Benneworth, CHEPS, Center for Higher Education Policies, University of Twente, MODERN project partner.

The MODERN project does further respond to the need for training in higher education by conducting a series of peer learning activities. These serve as pilot initiatives to develop new offers for both higher education institutions and their individual leaders.

I would like to thank all our partners in the MODERN project for their valuable contributions in developing our European platform. It is with their strong support and significant expertise that we are together, during the three years of the project, building a powerful tool to support the modernisation agenda and the further professionalisation of higher education in Europe.

Frans van Vught
ESMU President
MODERN project leader
15 September 2010

1. INTRODUCTION

1.1 UNIVERSITIES, THE SOCIETAL COMPACT AND REGIONAL ENGAGEMENT

The European higher education sector is already a decade into a fundamental process of reform, seeking to make universities and higher education an essential component of a competitive, sustainable and equitable Europe. The main elements of this wider reform process have involved harmonising and modernising funding, curricula and governance procedures for higher education institutions (HEIs) across Europe. The emphasis on these reforms has been in rewarding success.

Along with direct challenges has come increasing pressure on universities to meet societal needs. As societal demands become more complex, there are many other ways besides teaching and research by which universities can contribute to society. As early as 1982, CERI (1982) identified five mechanisms by which universities were working 'for' society, making facilities available, identifying community problems, researching societal issues, working for commissions from community groups and delivering services (such as health or education) in those communities. Allen (1989) highlights four areas, supporting knowledge creation, the arts, lifelong learning and the built environment as distinct areas where universities are already active.

At the same time, despite a range of predictions that the rise of the globalised knowledge society would see the 'death of distance', the reverse has been the case. Some knowledge is easily transmitted, but knowledge embedded in people is much 'stickier' in particular places. The places that can draw on the tacit knowledge of those most informed people are seeing themselves rise up the league tables of economic success and social cohesion. Universities' contributions to this 'sticky knowledge' in people and this pressure lie behind increasing pressures on universities to contribute to their regional economies.

But universities are educational institutions, not welfare organisations, raising the question of how far should this 'third mission' should shape university priorities. Although universities have long been understood to have a 'societal compact', (special privileges and funding in return for meeting societal needs), this compact is evolving rapidly in the context of this wider reform process. Universities must rethink both their traditional tasks of teaching and research, but also potential other tasks. It is to this balancing act that this report is devoted.

1.2 THE CHANGING SOCIETAL LANDSCAPE FOR HIGHER EDUCATION

Since CERI and Allen were writing in the 1980s, a new kind of regional role for universities has emerged (OECD, 2007). Governments at the European, national and regional scales have come to recognise that universities have long made a contribution to their regional economies. Universities are 'people businesses', and the people associated with universities become a resource for their regional economies. Even where universities have tried to ban societal interaction, as Johns Hopkins did in the 1930s, it has proven impossible to prevent university knowledge spilling into its immediate environs (Feldman & Desrochers, 2001). The 'regional mission' for universities is nothing new and certainly nothing of which to be afraid.

What has changed is the increased emphasis which governments are placing on this regional mission (OECD, 2007). In some countries such as Finland, universities have an explicit regional mission. In other countries, such as England, there are explicit funding streams promoting regional engagement. In a third group, such as the Netherlands, universities have become key partners in regional innovation partnerships funding university and industrial research to drive economic development. Demonstrating regional engagement is, in short, an increasingly important element of the way universities are able to demonstrate societal added value and their fulfilment of the 'societal compact'.

Universities have thus become drawn to regional innovation as they have come to terms with their new regional role. Innovation is underpinned by good relationships between people who exchange knowledge in developing new artefacts. And people undoubtedly find it easier to build these strong relationships to other people which they are in some way close to. This closeness, what economic geographers term 'proximity' may come through being geographically close, culturally close, or within the same corporate or career networks. As regions are places where people naturally build up contact networks in the course of their everyday lives, regions 'matter' for innovation. Universities have become involved in various different ways with these knowledge exchange networks and hence involved as players in the 'regional innovation game'.

But there is of course a tension for universities in engaging in regional innovation, catching universities on the horns of a dilemma. Universities have a set of core missions, primarily teaching and research, and no amount of excellent engagement can make up for deficiencies in these areas. Too much engagement can distract staff and students from core activities leading to poor performance. But too little engagement can likewise leave universities unpopular and without support for their public funding.

The key question for universities is how to manage these two processes in parallel, to create synergies between teaching and research (the 'core' missions) and regional innovation (the 'third' mission). Effective synergies may bring new resources and knowledge into the university and strengthen their roles as key knowledge institutions. There are other kinds of actors which universities encounter in regions connected into their own global networks, who can strengthen universities' own efforts to create excellent teaching and research. The challenge for effective university regional innovation is in finding ways to ensure that innovation strengthens rather than undermines these core missions.

2. THE IRRESISTIBLE RISE OF THE REGIONAL MISSION

The idea of a regional mission for higher education is now widely accepted as part of the ‘third mission’ alongside the key university businesses of teaching and research. But this is by no means an exclusively contemporary phenomenon. Part of what makes universities special is that they are universal, global institutions located in and contributing to particular places. Local contributions help explain why the institution of university has thrived in recent centuries over the last centuries.

Research into the regional impacts of universities is a more recent phenomenon, and has pointed to three kinds of contributions made by universities to their host regions, direct economic impacts, indirect service provision, and upgrading the quality of local economies and political systems. But although universities’ contributions can be better managed, the question is raised of who bears the costs for promoting university-regional engagement. Answering that question requires a better understanding of the mechanisms by which universities contribute to and engage with their regional economies, the subject of Chapter 3.

2.1 REGIONAL ENGAGEMENT AS PART OF UNIVERSITY-SOCIETY COMPACTS

Universities are by their nature societal institutions but their relationship with society is ambiguous. It is that ambiguity which endows universities with a unique value that other kinds of institutions do not possess (Baumunt, 1997). Universities embody two competing ideas which are often represented as a tension between the abstract and the practical, between the universal and the particular or between the excellent and the useful (Allen, 1988).

Where universities have historically been useful to society, then they have thrived: when they have not, then they have tended to wither and lead to the creation of new kinds of institution such as the French *Grandes Ecoles* (Phillipson, 1974; 1988). The relationship between universities and their host societies, and the duties that this places on universities is often referred to as the societal compact (Barnett, 2003).

The societal compact has changed in the post war period because of the huge growth in public funding of universities (Delanty, 2002). On the one hand, it is clear that universities evolution is driven by the emerging ‘knowledge society’ - a topic dealt with more fully in the following chapter. The increased size of the higher education sector as well as the more urgent demands for university knowledge places an enhanced imperative on universities responding to regional needs.

But on the other hand, many universities were created to have specific societal impacts and indeed to benefit their regions (Goddard, 2009). So it is important not to portray the rise of the regional mission as something alien to universities: rather it is a potentiality which was built into universities from their historical background, which was downplayed in the 1970s with the rise of the ‘democratic mass university’, but whose reactivation and re-animation may secure universities’ special societal function into the future.

Bender (1988) makes the obvious yet subtle point that universities are often urban institutions and indeed have the same dynamics and rationales as early cities. Cities were created as institutional forms which gave their ‘burghers’ (citizens) particular freedoms from direct feudal control (such as serfdom or peasantry) to facilitate trade. This trade in turn generated more wealth for feudal lords than possible under feudal agriculture. Cities were ‘spaces of freedom’ where people gathered from across a wide hinterland to trade, exchange and behave creatively and entrepreneurially (Hobbs, 1991). Universities’ origins were historically very similar, communities of individuals freed from commercial pressures to transmit abstract knowledge by teaching onto students. These students then fulfilled vital roles within this emerging mercantile society (such as council members, tax officers, or market governors) (Shils, 1988; Hyde, 1988; Biggar, 2010).

Many universities were created with a specifically regional mission: not necessarily to 'boost' their host region, but a mission to have a particular impact on that region. The historic origins of the university for these regional and societal purposes are in many cases still evident in the built form of those universities. The University of Leuven (*Louvain*) was created by Flemish wool merchants in the 15th century to act as a beacon for Flemish culture and to stimulate regional innovation (Tobback, 2009).

Picture 1 The Leuven University library's Golden Age architectural style



Leiden University was established in the Netherlands in the late 16th century as part of the resistance in the Free Netherlands to Spanish occupation, following the fall of Antwerp (Arbo & Benneworth, 2007). The University of Lund was created in the 17th century by the Swedish Crown to establish Swedish elite culture in formerly Danish southern provinces recovered following the 1660 Treaty of Roskilde (Benneworth *et al.*, 2009). These were all universities created with specific regional or provincial missions - albeit in some cases serving higher national missions. It is perhaps interesting to note that these three universities are some of the highest ranking European universities in that most contemporary invention, the league table, highlighting the point that regional purpose for universities need not necessarily come at the expense of excellence (In Times Higher 2010 Rankings, Lund is ranked 89, Leuven 119 and Leiden 124).

Picture 2 The University of Lund



The Industrial Revolution provided a further impulse to the higher education's regional mission. Although the idea of the Humboldtian University is often cited as the archetypal university form of this era (Flexner, 1930), serving national economic interests, it is important not to downplay the local and regional dimensions underlying new universities created in this era (McLelland, 1988; Elton, 2008). Even in Germany, the regional impacts of universities were implicitly acknowledged by a long standing tacit agreement not to create a university or HEIs in Germany's leading heavy industrial region, the *Ruhrgebiet* (Hennings & Kunzmann, 1993). This arose out of a fear that providing higher education would reduce the workforce available for heavy industry. It was not until the beginning of the decline of carboniferous capitalism in the Ruhr, in 1965, that it received its first university.

In England, the colleges which went to form the university of London were specifically created by industrialists dissatisfied with Oxford and Cambridge Universities as source of new innovators and engineers (Charles & Benneworth, 2001a). As early as 1831, there were calls in the North East of England for a new university to support the mining, steel and marine technology sectors, arguing that universities in London, some 450km away, were too remote to create the necessary highly educated class to sustain industrialisation (Greenhow, 1831). In the 1890s a new wave of large urban universities were created in Manchester, Leeds, Liverpool and Birmingham, strongly supported by local entrepreneurs and public subscriptions (Dobrée, 1943; Halsey, 1996). In 1912, C. B. Fawcett, in making his proposals for a new provincial structure for England, argued that excellent civic universities - closely related to local industry but also undertaking high quality higher education - were one distinguishing characteristics of his proposed provinces.

Picture 3 The famous ‘red-brick’ of Liverpool University’s engineering laboratories



In America, although the Land Grant universities are often likened to Humboldtian institutions, their creation made them far more regional in their nature than the nationally focused German universities (Etzkowitz, 2008). Being directly funded by their States, entitled those State Legislatures to place demands on those universities. Some created extension services to help diffuse new technologies and techniques into agriculture and industry, promoting national competitiveness by supporting firms regionally (Greenwood, 2007). That regional mission remains important to those institutions today, recently reaffirmed by the Kellogg Commission into the future of the Land Grant universities in America, despite the fact that the Land Grant sector are often leading, world-class universities in their own right (2000). MIT, ranked 2 in the THE rankings, is a private land-grant university, and University of California, Berkley ranks 8).

2.2 RESEARCH INTO UNIVERSITY-REGIONAL ENGAGEMENT: THREE WAVES

Although there has long been a recognition of universities' regional impacts, research into those impacts only took off in the 1970s. It is possible to distinguish this research into three waves, each of which have a slightly different emphasis. In the first wave, effort was placed into calculating universities' direct economic impacts using econometric methodologies. The second wave extended this beyond purely economic impacts by surveying other kinds of impacts. The third wave focused on universities involvement in various regional economic development processes. It is from this third wave of research that the interest in regional innovation has arisen, as a increasingly important regional development process.

THE DIRECT ECONOMIC IMPACT OF UNIVERSITIES

The first wave of research into universities' regional impacts emerged in the late 1960s and early 1970s, and must be seen against two backdrops. The first is the quantitative revolution in the social sciences, in which an increasing number of numerical analytic techniques were adopted into disciplines such as economics and geography, placing a premium on the enumerability of research and its findings. The second was the wave of expansion taking place in higher education in the 1960s which had been in many countries justified in terms of an economic imperative.

Cooke (1970) and Brownrigg (1973) exemplify these approaches, using relatively simple approaches, treating the university as a business and looking at the economic activity which emerges in the region as a consequence of the presence of that university. These approaches basically attribute universities' economic impacts to three main elements, the direct purchasing of supplies by the university, the jobs emerging from the staff salary and student living expenditure in the region, and then the additional economic activity induced by that additional expenditure in the regional supply chain. These techniques were refined in the course of the 1980s and 1990s (cf. Florax, 1992; McNicoll, 1995), with the growing sophistication of econometric modelling encompassing techniques such as computable general equilibrium models and social accounting matrices (McGregor *et al.*, 2009).

UNIVERSITIES' WIDER REGIONAL DEVELOPMENT IMPACTS

The second wave of research into universities' regional impacts focused on gauging the wider set of activities by which universities generated impacts. A groundbreaking report in this regard came from the OECD's Centre for Educational Research and Innovation (CERI) in 1982. This report made two useful distinctions; the first was in distinguishing business and community impacts, arguing that total impact was at least the sum of those two. The second was in saying that universities have to choose their own targets for engagement, with following one of three rationales. This engagement rationale could be target audiences (e.g. farmers for agricultural universities), missions (e.g. emancipation of particular groups as in the Antigonish University, Canada or the Free University, Amsterdam), or a particular locality or territory. This highlights regional engagement's role of one of three ways of upholding the necessary societal compact.

Following the CERI report, much research sought to set out all the different kinds of universities' regional impacts. Much work was undertaken in the UK, for example by the Committee of Vice Chancellors and Principals who in 1994 published their *Universities and Communities* report (Goddard *et al.*, 1994). As well as systematically reviewing the first wave evidence, this also set out some key dimensions of universities impacts: the provision of health services, sporting and cultural services, technology transfer, volunteering, school reach-out work and continuing education. This regional dimension was taken forward in the subsequent Dearing Review of Higher Education, which recommended creating a regional stream of funding in the UK, what became the current Higher Education Innovation Fund (HEIF).

FROM UNIVERSITIES' ACTIVITIES TO INFLUENCING REGIONAL DEVELOPMENT PROCESSES

The difference between the second and third waves of literature was that whilst the second wave regarded universities' regional impacts as involving service provision, the third wave dealt with universities' transformational impacts on regional economies (Cochrane *et al.* 2009). Gunasekara noted that this was what he termed a 'generative' impact, offering a service which acted as an input to regional development activities. Gunasekara (2006a; 2006b; 2006c) contended that an arguably more valuable contribution which universities could make to regions was in upgrading the quality of demand. Jaffe (1989) noted a positive correlation between university activity and rates of investment in R&D amongst local businesses, and this is illustrative of universities' transformative, rather than direct, impacts.

In practical terms, rather than focusing purely on training engineers for medium technology businesses already present in the region, universities could help to create higher value added sectors and upgrade those existing sectors to be higher value-added (Doutriaux, 2008). Of course, this in turn meant that university regional impact was dependent on two other variables, firstly the nature of the region within which the university was located, and secondly, the fit and history of co-operation between the university and regional actors (Fontes & Coombs, 2001; Boucher *et al.*, 2003). Where the second and third waves came together was in a recognition that there were a range of areas - not just economic - where universities could upgrade regions, including in terms of the quality of governance and decision-making (Goddard *et al.*, 2007).

THE RELATION OF THE THEORY AND PRACTICE OF UNIVERSITY-REGIONAL ENGAGEMENT

It is perhaps slightly unfair to characterise these different approaches as different waves of literature, although their emergence was certainly sequential, with each providing the basis for the successor approach. What it is true to say is that in understanding regional impacts there are different lenses which can be taken to understand that activity. Universities do create economic impacts as other kinds of businesses through their expenditure effects; they also generate an array of services that may or may not otherwise be available within the regions, and they do help to upgrade regions and help them proceed along Phil Cooke termed (1995) the 'high road of regional development' in contrast to the 'race to the bottom'. But there is an entirely separate question which emerges here of how much effort universities should place into maximising these benefits for the region.

It must be recognised on the one hand that the second wave of literature provided the foundation for the third wave. At the same time it provided a good framework to persuade policy-makers to take universities' regional engagement more seriously. HEIF (qv) provided the rationale for the annual Higher Education Business and Community Impact Survey (HEBCIS) which provides detailed breakdowns of universities' regional impacts. That also laid the groundwork for the Higher Education Funding Council for England's support for a set of regional reports on English higher education (Charles & Benneworth, 2001), which in turn informed the OECD in developing their Universities and Regional Development (Goddard & Chatterton, 1999a; 1999b) programme as part of their Institutional Management of HE programme (cf. Arbo & Benneworth, 2007).

2.3 UNDERSTANDING THE UNIVERSITY-REGIONAL DYNAMIC

The question for universities is why engage with regional actors beyond that which occurs naturally as a consequence of the institutional profile and existing relationships. Certain kinds of study which lead directly to vocations, typically involve placements and practical elements which create natural links between universities and their localities through their students. This is as true for the most academically demanding disciplines such as medicine and law as it is for more technological and engineering oriented subjects. But in thinking 'regional impact beyond the unintentional' the question of the rationale for that engagement must be addressed. In short, why would a university want to pay attention to the issue of regional engagement, given that that engagement's localness and practicality is potentially contrary to universality and abstraction which characterises university activities?

In some cases, universities are held accountable for the way that they produce regional impacts. In Finland, for example, the government has stated that "Finland's welfare and international competitiveness rests on the international innovativeness and vitality of the regions, which is promoted by a regionally comprehensive provision of research and teaching" (OECD, 2007, p.113). In both Australia and Norway, waves of HEIs have been created specifically to ensure comprehensive higher education provision across the remoter parts of their respective national territories (Rutten *et al.*, 2003). Australia's 2007 Bradley review recommended the creation of a single national university for Australia's regional (remote rural) areas (Gilmour, 2009).

But in other cases, it is not so clear as to why universities would choose to engage with their regions (Levin, 2007). The regional dimension does clearly suffer from being seen as a second tier of activity, either as second class rather than world-class or as an added extra undertaken out of a sense of corporate responsibility rather than enthusiasm or interest (Brink, 2007). With universities facing pressures from increasing numbers of external partners or stakeholders, they must make conscious, strategic decisions over to which pressures and demands they will react (Jongbloed *et al.*, 2007). Where there are not key stakeholders such as governments (as in Finland, Norway and Australia) who make the regional dimension important, the question is whether universities can meaningfully engage beyond this 'natural' level of regional engagement.

Perhaps more to ask is under what conditions regional partners can become universities' key stakeholders. Firstly, regions are already important stakeholders for some kinds of HEIs, notably teaching-led institutions such as *Fachhochschulen* and Universities of Applied Science. Secondly, some kinds of regions stimulate their universities, posing interesting questions and creating a productive symbiotic relationship, such as in Silicon Valley or Route 128 in America (Saxenian, 1994). Thirdly, in some case universities and regions (regional partners) have a

long history of working together. Finally, there can be situations where universities are legally mandated or encouraged to work with their regional partners.

All these situations are examples of regional engagement fulfilling universities' societal responsibilities, fits with existing institutional cultures and structures whilst creating funding opportunities. In short, there are many kinds of situation where regional engagement can help bring resources into universities which support core university activities.

Harloe & Perry (2008) have pointed to the rise of urban science policy, urban and regional authorities investing in universities partly driven by the promise that investments stimulate urban competitiveness. But having a strong university with an international reputation is also seen as an important element of what it means to be a 'global city' (Benneworth *et al.*, 2010). The rationale has emerged that universities provide something attractive that brings other kinds of actors to these cities - consultants, industrial scientists, financiers and technologists as well as students and world class researchers. This has the effect of strengthening those cities, with the universities contributing to a more general sense that those places are the 'place to be' to be involved with particular technological areas (Gertler, 1995).

The image of universities as hubs attracting 'world citizens' to regions is alluring: Florida (2002) argues that place competitiveness is driven by their attractiveness to key workers, the "creative classes". Creative classes have a preference for working where they feel comfortable, where there is a stimulating working environment and where there are career opportunities for themselves and their families, his so-called '3 Ts' of talent attraction, technology and tolerance. It is intuitively attractive to see universities as a key part of a talent attraction strategy, although in practice getting involved with localities can be a fraught process for universities (Benneworth *et al.*, 2010).

For universities seeking to fulfil the societal compact through the 'regional' channel (*cf.* CERI, 1982), then some important questions exist:

- How can regional engagement align with regional partners' interests, goals, strategies and resources of regional partners?
- How can this lead them to wish to invest in universities' research, technology transfer, knowledge exchange and student placement activities?
- Where is the two-way mutual benefit in universities interacting with their environments, so that stronger universities emerge in tandem with stronger places?

To understand these questions, it is necessary to look more closely at how places develop economically in the contemporary context of the knowledge society. That leads to regional innovation as a lead driver of territorial economic development, and provides a solid basis for understanding from where the mutual benefits can emerge in university-regional engagement.

3. FROM A REGIONAL MISSION TOWARDS REGIONAL INNOVATION

In recent decades, knowledge and innovation have become increasingly important to economic success. Innovation - the development of new products, processes and techniques - has also been recognised as an interactive process undertaken between networks of actors. Where there is repeated and regular interaction, then these networks of innovators help to stimulate new kinds of innovations. But these 'innovation systems' remain networks of people, and their capacity to build networks is limited by which their comfort zones - which actors they feel close to. The regional scale - the scale of regular daily interaction - becomes important as a scale at which innovators can regularly personally interact and exchange tacit knowledge.

This helps explain where common interests for universities and regions lie. Universities on the one hand contribute to regional innovation environments to fulfil their societal obligations. Universities help to provide a gateway to the wider world for their regions and to create new assets for regional innovation. Stronger regions can be places where universities can better co-operate with a wide array of partners to strengthen their own knowledge bases and improve their core businesses of teaching and research. At the same time, by participating in regional innovation, universities make themselves eligible for new kinds of investment that can at the same time strengthen their core activities.

3.1 THE KNOWLEDGE SOCIETY, KNOWLEDGE CAPITAL AND INNOVATION

In the last fifty years, societies have become increasingly dependent on knowledge for economic growth (Romer, 1994; Solow, 1994). Unlike traditional capitals, land, labour and machinery, knowledge capital is distinct in terms of having increasing returns to scale (Temple *et al.*, 1998). Increasing concentration of knowledge capital in a particular place increases the overall productivity of that capital - knowledge capital does not suffer from congestion. Knowledge capital drives economic growth through innovation, creating new products, processes and techniques (NESTA, 2006).

Although innovation has often been conceived of as a 'pipeline' in which basic research is applied through businesses and translated into new products, a more realistic understanding of innovation is an uncertain interactive process (Kline & Rosenberg, 1986; Utterback & Abernathy, 1975). In seeking to solve problems arising in creating new products, innovators draw on a wide range of knowledge sources. A key element of what lubricates the knowledge economy is knowledge exchange between different actors, leading to novel forms of economic organisation, what Gibbons *et al.* (1994) refer to as 'Mode 2' and Etzkowitz & Leyesdorff (2000) as the 'triple helix'.

Part of what these different models of societal organisation are trying to explain is how knowledge exchange functions. Williamson (1975) first placed the fact that knowledge exchange in a market setting suffers from a problem known as 'information asymmetry' on the academic agenda. The problem is quite simple: if I want to buy a new piece of knowledge from someone else, how can I evaluate whether the vendor does indeed have the knowledge and whether that knowledge is fit for purpose? If I am the vendor, I do not want to disclose the knowledge to the buyer for their evaluation, because then they have access to the knowledge and have no need to then buy it. In market settings, this drives a tendency to under-invest in knowledge because buying it is risky, which gives longer-term competitiveness problems.

Williamson argued that the classic solution to this problem was command hierarchies such as governments or corporations, in which knowledge was exchanged internally. The large, integrated corporation emerged in the post-war period as a good driver of innovation precisely because it solved the information asymmetry problem. Corporate research laboratories created knowledge not as the first stage of an innovation pipeline, but so that the firm owned the necessary knowledge to solve problems which might arise in its industrial development processes. But these hierarchies had problems of inefficiency of latent knowledge: if you were developing all

kinds of knowledge that might later be useful, by definition you overinvest in knowledge, as wasteful as underinvesting.

Williamson proposed a third solution underinvestment in markets and over-investment in hierarchies, namely optimal investment in networks. People involved in knowledge transactions built up mutual relationships, overcoming mutual distrust without creating hierarchies. These networks were built on user-producer interaction founded upon trust building-up. This in turn gave both parties a sense of the value of the knowledge exchange, sometimes by involving producing new knowledge (Lundvall, 1988). These kinds of relationships were observed in a number of emerging competitive and innovative business networks in the late 1970s and early 1980s (Piore & Sabel, 1984).

But building trust is a long-term process and not necessarily the most effective way of creating access particular types of problem-solving knowledge. Lundvall (1988) observed a tendency for relationships to form into more enduring networks between innovating partners, including public research laboratories and firms alongside corporations. These networks created ways of working, habits, and routines which facilitated knowledge exchange between actors, including between those which had no history of mutual trust. At the same time, governments tended to regulate and finance innovation activities which fitted with their existing innovation actors and with their routines and habits within those networks.

Over time, particular innovative sectors evolved from loose networks of firms, universities, laboratories and governments into something more akin to formal systems. There was a kind of systemic trust built into the network, leading Lundvall to propose the concept of the national innovation system as the relationships between all actors involved in innovation, supported by formal institutions, regulations, government policies and also by informal codes, practices, routines and ways of working (Nelson, 1993; OECD, 1997). These ideas of national innovation systems became highly influential in science, technology and innovation policy, not least as a consequence of OECD championing. Different countries' innovation success could be understood in the ways that actors and institutions came together to create systems more or less supportive of different kinds of innovation.

Malecki (1997) summarised the key issue facing the notion of national innovation systems (NIS). Because NISs were complex constellations of institutions, empirical analysis of these networks was made more difficult when so many institutions, such as universities or multi-national corporations, worked across national boundaries. NISs offer no clear prescription for determining what universities *should do*; as evolutionary systems, universities support particular kinds of activities, but there are not clear messages beyond rather general messages about creating technology transfer offices and reforming patent, licensing and technology venturing regulations to encourage more academic entrepreneurship.,

3.2 REGIONAL INNOVATION SYSTEMS

At the same time, there was a growing recognition that nations were not a good way of describing the new geographical patterns of industry (Storper, 1995) comprising local or regional production networks embedded within broader - global - production chains or filières (Lawton Smith, 2000). Storper (1993) famously described this situation as 'regional worlds of production' - in successful flexible production clusters such as those found in Paris, Silicon Valley or the 'Third Italy' - one encountered representatives of key global actors who came to the region precisely because it was a centre for the world industry (Storper & Salais, 1997).

The simple explanation was that certain kinds of knowledge (Nonaka, 1994) were more easily transferred through face to face contact than other kinds. If you could write a piece of knowledge down, then it could easily be transmitted over large distances: facts and theories both fit into this category, (know-what and know-why), which can be termed 'codified knowledge'. Other kinds of knowledge important to innovation are much more dependent on the person who possesses them, such as the knack of making a centrifuge work (know-how, or 'tacit knowledge'), or knowing who in the council you need to ask to get planning permission and subsidies for a new factory.

These kinds of knowledge can only be transferred through intense and interpersonal contacts reliant on building of relationships between both the transmitter and the receiver. Good innovation environments were successful because they had 'pools' of tacit knowledge: new innovation actors came to those places because they had to be *in situ* to access that tacit knowledge. In innovative regions it was easier to locate particular useful pieces of 'tacit knowledge' (or competent and skilled individuals) than in others. A number of authors drew on the idea of these places having a kind of 'knowledge pool' that other actors could more cheaply dip into during their own innovation processes, thereby cutting the costs of innovation, and improving the overall business competitiveness (Lawson, 1999; Maskell & Malmberg, 1999).

A growing recognition that innovation was primarily local rather than national in nature led to considerable work attempting to understand what drove territorial innovation processes in successful places. Moulaert & Sekia (2003) coined the phrase the 'territorial innovation models (TIM) family' - to cover the gamut of explanations emerging in parallel across social sciences explaining why innovation concentrated in particular places (cf. Lagendijk 2003). TIMs are all based on notions of knowledge spill-overs (Storper, 1995). This was later acknowledged only to be part of the story, with physical proximity just one potential variable facilitating tacit knowledge transfer, Boschma (2005) identifying also organisational, cognitive, regulatory and disciplinary as other dimensions of proximity.

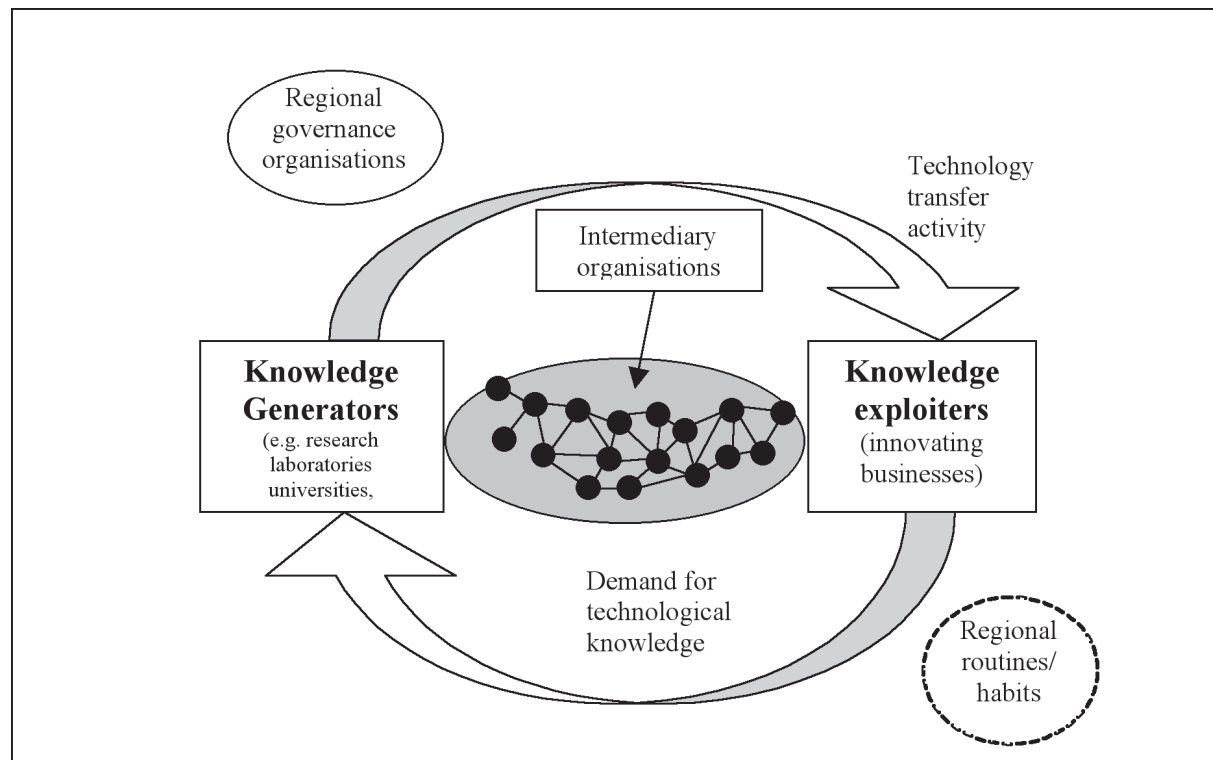
National innovation systems describe the way that regular interactions between innovating actors within countries acquire systemic properties (Nelson, 1993). The idea of regional innovation systems emerged as a TIM to describe the way that these regional networks built up soft institutions and hard regulations supported these places' competitive advantages for innovation (Cooke, 1992; Morgan, 1992). The idea was later criticised for being strongly supported by a policy community centred around accessing European subsidies (Lovering, 1999). Nevertheless, the idea of regional innovation systems fitted very neatly with a burgeoning body of evidence which began to emerge from the mid 1990s onwards.

This started to demonstrate conclusively the importance of local environments and relationships between different kinds of actors, necessary to create supportive environments for innovation (*inter alia* Alderman & Thwaites, 1992; Asheim, 1996; Gertler, 1995; Hassink, 1993; Keeble, 1997; Longhi, 1999; Morgan, 1997; Simmie, 1997; Scott, 1996). Although the idea has developed since first being advanced in the early 1990s, the idea of a regional innovation system describes relationships between four kinds of actors (cf. Cooke *et al.*, 2003; Cooke, 2005; OECD, 2009):-

- **Knowledge producers:** organisations producing new forms of knowledge later applied to solve particular problems encountered in innovation activities.
- **Knowledge consumers:** organisations exploiting knowledge created elsewhere by creating new products, processes and techniques that generate sales and improve competitiveness.
- **Intermediary organisations:** organisations encouraging co-operation between knowledge producers and consumers, by acting as an honest broker or providing subsidies to overcome information asymmetries.
- **Regional governance organisations:** organisations setting or influencing the 'rules of the game' of a regional innovation system (RIS): RISs are rarely sufficiently autonomous to set their own rules of the game, but they can produce local variants ('styles of innovation system', cf. Lundvall, 1998).

The various elements hang together as in regional innovation networks which regularly interact and acquire systemic qualities. The 'motor' driving regional innovation systems is the interaction between knowledge generators and exploiters: knowledge exploiters 'demand' knowledge from generators, and generators transfer it to those exploiters. Intermediary organisations facilitate technology transfer, within policy and regulatory frameworks set by regional governance organisations. The final element of a RIS are the regional routines and habits - the 'informal institutions' specific to regions, which facilitate systemic interaction. This creates a dynamic interactive network with sufficient regularity of interaction to have systemic properties: figure 1 below provides a conceptual model of an archetypal regional innovation system.

Figure 1 A conceptual model of a regional innovation system



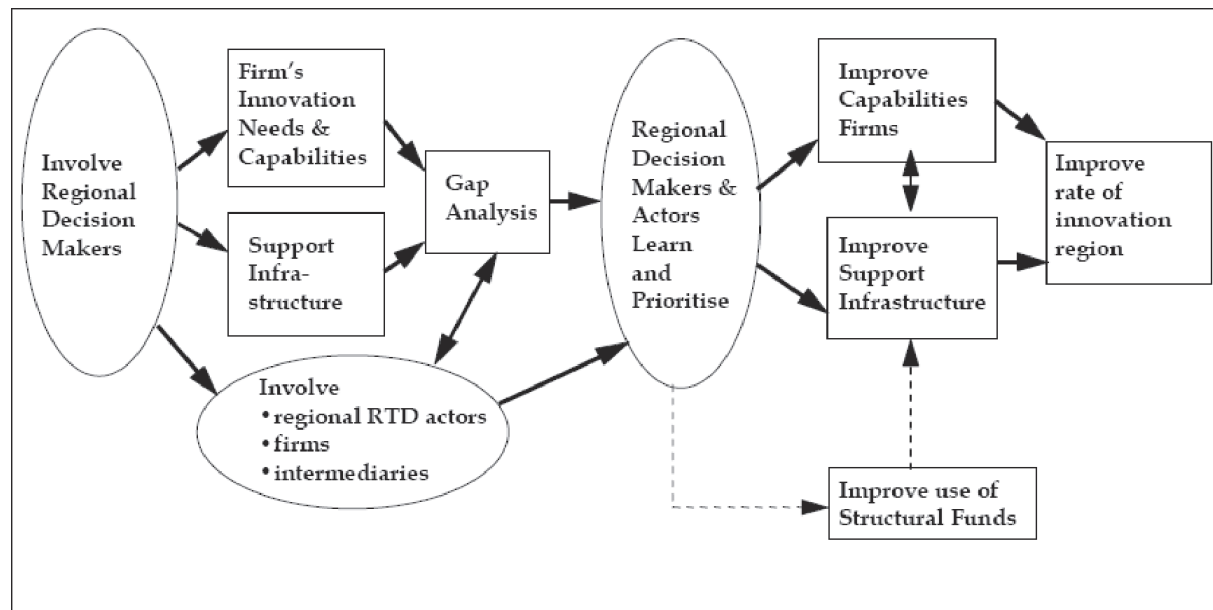
Source: Coenen (2008)

The suggested role for universities here is quite clear, as one of a set of knowledge generators who transfer their technologies and knowledges to regional firms. Implicit with this model is the idea that universities (and knowledge generators more generally) have a duty to respond to regional demand. However, universities do not always have research and teaching well-matched to regional demands. Universities as autonomous organisations are often unwilling to specialise too highly around local businesses' needs (Fontes & Coombes, 2001). Many universities therefore responded in practice by creating a technology transfer infrastructure to avoid an uncomfortable situation of firms too closely determining core university priorities and activities (Jones-Evans *et al.*, 1999).

3.3 HOW 'REGIONAL' ARE REGIONAL INNOVATION SYSTEMS?

It is clear that the concept of regional innovation systems has been popular is because of much such support from policy-makers (*cf.* Landabaso, 1999). Part of that success was because the concept was readily operationalised into a policy prescription which all places could adopt to develop a regional innovation strategy (Boeholt *et al.*, 1998). An archetypal prescription for building a regional innovation system involves mapping regional knowledge producers capacities, regional knowledge exploiters needs, identifying the gaps between the two, then filling those gaps by a mix of education and new institutions, funded by regional policy funds, shown in figure 2 on the next page.

Figure 2 A standardised process for building an effective regional innovation system



Source: Boekholt et al., 1998

But this policy emphasis has also shaped how academics regarded regional innovation systems, not least because regional policy-makers have funded research into regional innovation systems. But whilst it might be acceptable for regional policy makers to exclusively concern themselves with what was taking place within their regions, there was a growing dissatisfaction amongst academics who felt that a regional innovation system imposed a 'scalar envelope' (qv) upon innovation studies (Cooke, 2005). The idea of a '**scalar envelope**' is focusing exclusively on things happening within a territory ignores are external factors determining or shaping regional activities. A multi-national firm is much more influenced by its own corporate policy in deciding whether to co-operate with regional partners than on whether there is a technology relay office helping them to find regional partners. By failing to look beyond the region, regional innovation studies missed an important element of the picture of what 'mattered'.

This critique is not novel: most famously, Doreen Massey had asked as early as 1978 the extent to which the UK regional problem (the decline of low-technology branch-plants in peripheral regions) was a genuinely regional problem, or to what extent it was a consequence of national government policy and multi-national corporation decision-making. In the context of debates around the rise of flexible production systems, it was in particular Ann Markusen who sought to highlight the importance of external determinants on what particular industrial districts achieved. Markusen classified regional innovation systems according to the degree of local power which their actors had within wider global networks (1994; 1996; Gray et al., 1996).

The RIS approach evolved by acknowledging that at least three key types of RIS actor were embedded within much wider networks beyond regional boundaries. Those much wider networks influenced what they could achieve locally, and therefore shaped the regional environment for innovation, how things like territorial knowledge pools and knowledge spill-overs functioned. The three types of actors were firms, embedded in corporate and sectoral innovation systems, universities, embedded in global networks of prestige and reputation, and governance actors, in multi-level governance systems.

As far as firms were concerned, Storper (1995) argued that corporate innovation took place within corporate innovation systems connecting different places. He argued that multi-national corporations are "*inter-regional and international networks for technology development are systems which exchange the specialised knowledge that is valued in each of the nations and regions in which they are active (between different parts of the firm)*" (Storper, 1995, p. 897).

Niosi & Zhegu (2005) said that in the aerospace industry it was the global production network, and the sectoral innovation system, rather than the firm, that was important: *“supply chain management is the vehicle of knowledge spill-overs in the industry. This chain is basically international”* (p. 12).

Christopherson & Clark (2007) noted that firms’ attitudes to co-operation shaped regional innovation systems. In the Boston ICT industry, for example, a number of large firms operated anti-competition clauses for departing employees which restricted the operation of the local knowledge pool.

The second group of actors who are located within wider (global) networks are knowledge producers, particularly universities and research laboratories. As well as selling their knowledge globally to knowledge exploiters, universities are also active in other global networks to achieve their wider goals. Universities seek to recruit students, research partners and investment from beyond their regional boundaries, and they do this by building reputation, prestige and quality in their activities (Salmi, 2009).

“Global research partnerships and knowledge exchanges are common-place; these complement (rather than substitute for) strongly localised learning dynamics” (Gertler & Wolfe, 2006, p. 227).

Research quality is judged within international networks, through publication records within international, often English-language journals and prestigious scientific awards (Becher & Trowler, 2001). Esteem indicators for professors and researchers are also often international, often based on disciplinary boundaries (in some countries there can be national cultures which prize primarily national recognition, such as national academies or learned societies). This underscores that universities’ reputation and prestige - which help attract external resources - are driven by factors originating outside the region (Boucher *et al.*, 2003).

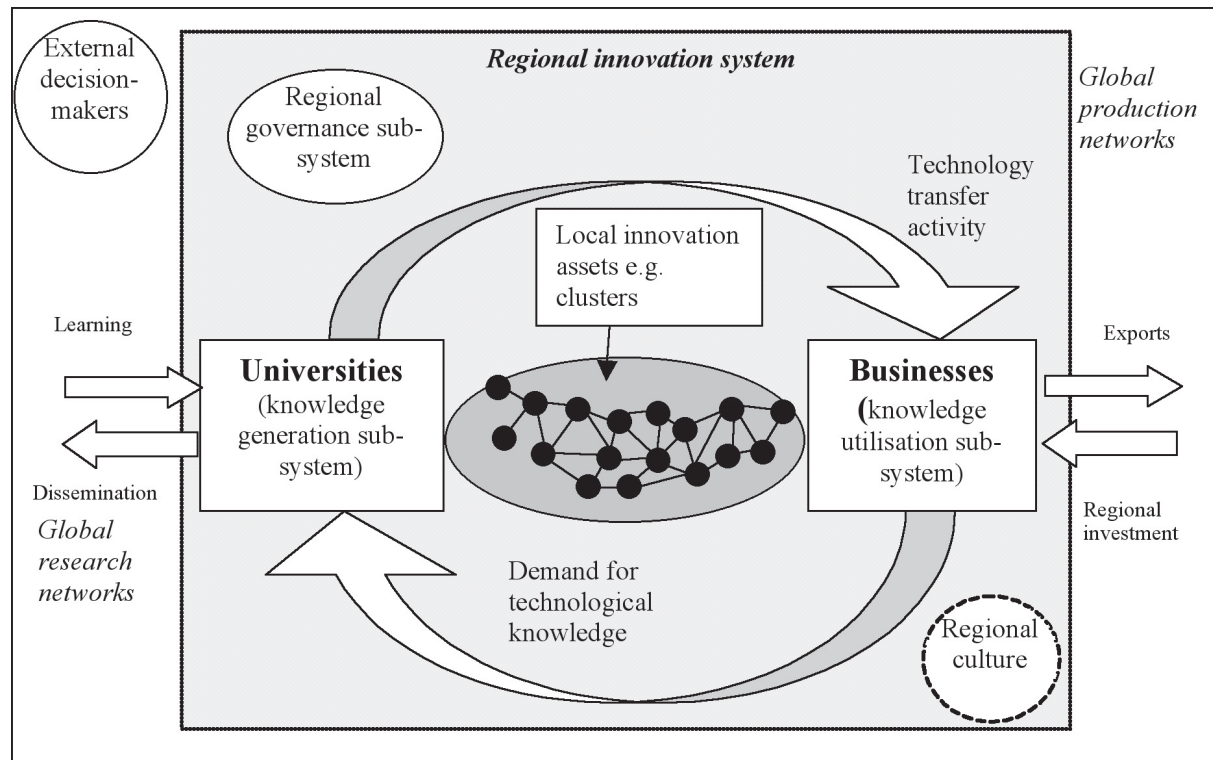
The third set of regional innovation actors embedded within wider networks are regional governance actors, including regional government, regional and local administration, and regional development and innovation agencies. This tier of decision-making is becoming increasingly important to shaping national and international science, technology and innovation policy (OECD, 2008). Although innovation policy may be managed regionally, innovation capacities are also shaped by national policies such as trade and investment policy, education/ labour market, science, regulation and taxation policies tend to be reserved to the national level as being of wider strategic significance (Goddard & Chatterton, 2003). Internationally, regions are restricted by international and multi-lateral agreements: in Europe, regional governments are strongly restricted by European Competition Policy (‘State Aids’) into the kinds of direct support they can provide for businesses. Innovation and spin-off activity is also influenced by international intellectual property frameworks which individual regional governments have a very limited capacity to influence.

3.4 REGIONAL INNOVATION SYSTEMS AS LOCAL MEETING POINTS FOR GLOBAL ACTORS

This preceding critique does not mean that the idea of a regional innovation system has no value for understanding territorial competition in the new knowledge economy. But it is critical to rethink ideas about regional innovation systems making explicit the global connections which particular actors have, and how regional innovation systems are influenced by external drivers. Regional innovation systems are not hermetically-sealed spaces, but rather more or less loosely bounded nodes where actors operating globally come together to interact to support innovation.

In interacting, these globally-active actors can create activities that benefit their host regions; these may be particular knowledge pools upon which other local actors can draw (cf. Storper, 1995; Lawson, 1999; Maskell & Malmberg, 1999) but also attracting new resources into the region that would not otherwise be there. These may be financial investment resources, highly skilled people, or research and teaching infrastructure. Figure 3 shows how regional innovation systems operate within these wider external networks:

Figure 3 A regional innovation system as local network between global innovators



Source: after Cooke & Piccaluga (2004) in Benneworth & Hospers (2007)

Asheim and Isaksen (2002) argue that this regional capacity of better use more globalised knowledges which increasingly determines competitiveness: the “stickiness of some forms of knowledge is seen as one of the few remaining genuinely localised phenomena in the current global economy” (p. 3).

As Gertler & Wolfe, 2006 observe, “Non-local (inter-regional and international relationships are crucial sources of vitality, complementing the local buzz that has come to be regarded as the hallmark characteristic of the cluster”.

Christopherson & Clark argue that regional actors ensure that local actors can access as resources brought into the region, by anchoring those resources in other regional activities, creating genuine spill-over and ripple-out effects from global players’ otherwise quite closed and isolated regional activities. In terms of creating regional benefits, Oinas & Malecki (2002) identify the importance of what they call ‘local: distant connectors’: organisations that ensure that global activities located regionally do create spill-over benefits supporting regional economic development . They define these “local and remote connectors” thus:

“The actors ... are centrally individuals (entrepreneurs, managers, employees, individuals in governmental or semi-governmental bodies, researchers, etc.) with their interpersonal networks (face-to-face, virtual, or a combination of these) and firms (multi-locational/multinational) and their networks of various sorts: (advanced) customers, universities, research institutions, support organizations (such as chambers of commerce, knowledge centers, government bodies, and consultants) ... Innovation involving both local and distant relations often center on networks of these actors” (2002, p. 119).

This offers a good model for universities’ roles in regional innovation systems, as global-local connectors, what Bathelt *et al.* have coined as “global pipelines creating local buzz” (2004). For reasons explored in the following chapter, universities are often very strongly rooted in particular places and far less likely to relocate than other kinds of actors such as firms or even government research laboratories. Universities act as points of stability in regions with which other, more transient, innovators establish relationships and creating regional benefits.

As Boucher *et al.* (2003) point out, the precise roles which universities play in RISs also depend on the other actors present: where there are fewer big innovation actors, then universities often become more central, and where there are diverse, metropolitan innovation systems, there may be less demand for this. But Benneworth *et al.* (2009) demonstrate that even in diverse innovation systems, universities may be instrumental in helping form partnerships and co-operations - filling in the 'missing links' which hold the innovation systems together.

But the RIS model also makes the point that regional innovation is not an act of charity on behalf of the university. Rather, the region is a place where universities access resources which strengthen their position within global networks. Just as firms develop new products in particular places to compete globally, regional innovation activities can contribute and provide resources, infrastructure and talent to help universities compete globally, and building prestige and reputation. University-regional engagement creates benefits which helps engaging universities compete more effectively globally. The question is how can that be achieved, a question to which the next chapter turns.

4. UNIVERSITIES AS GLOBAL PIPELINES DRIVING LOCAL ECONOMIES

Regional innovation provides a means for universities to engage with their local environments on activities which benefit both regional partners whilst strengthening universities' own core activities. This is complicated because universities, as well as other partners within RISs, are involved in their own extra-regional networks. A second global players is that universities provide innovation services and improve innovation systems. Understanding universities impacts on RISs requires understanding each of these.

In this chapter, we begin with a basic model of university-regional innovation, with universities and regional partners co-operating dynamically to build mutual synergies, also involving their partners beyond the region. We then consider the kinds of stakeholders which universities face in supporting regional innovation. Finally, we then offer a model or heuristic for universities' regional innovation based on creating regional projects which improve the RIS, satisfy sets of stakeholders and meet core university goals.

4.1 A FIRST-STAGE MODEL OF UNIVERSITY REGIONAL INNOVATION

In seeking to understand where common interests lie between universities and their regions, it is useful to consider how they could potentially interact. Universities are substantial institutions with budgets of hundreds of millions of Euros, employing thousands of staff directly, and through their staff and student expenditure, responsible for substantial economic impacts in their localities. Regions can likewise be understood as a set of assets, bundled into firms, public organisations and voluntary activities, but which can be creatively recombined to create new (innovative) economic activities. The question is how these assets can be collectively and creatively combined to best meet universities' as well as other regional actors' needs.

THE UNIVERSITY-REGIONAL VALUE-ADDED MANAGEMENT PROCESS

A starting point comes through the fact that both universities and regions are increasingly 'managed' activities. Part of the paradigm of regional innovation systems has seen the increasing growth (in the EU, mandated by the European Commission) of regional economic development strategies. These regional strategies, overseen by economic development agencies, create frameworks guiding investment activities by firms, public bodies and community groups, identifying future opportunities worthy of public subsidy and provide private businesses with confidence to make risky investments.

At the same time, universities are increasingly strategically managed to deliver a set of outputs efficiently and publicly accountable, ensure they invest sufficiently to retain their attractiveness to future new talent in terms of career opportunities, research infrastructure, research environments and teaching loads. For universities, the question is also how to manage the various activities - teaching, research, infrastructure development, and community outreach - to create synergies and critical mass between activities, allowing sort-term efficient behaviour run that does not come at the expense of longer-term institutional survival.

Goddard & Chatterton (2003) provide a very useful model of this process, which identifies clearly universities' and regions' common interests around regional innovation. Both universities and regional actors seek synergies between their various activities: universities regularly use for example their students (teaching) to undertake research (through dissertations) and community service (student placements). It is increasingly common for regional actors to encourage activities which support one particular form of regional development to also support another. A common link is between culture and skills, with it being increasingly common for public funding for the arts being contingent upon those arts institutions working with schools and communities to contribute to the raising of local and regional skill levels.

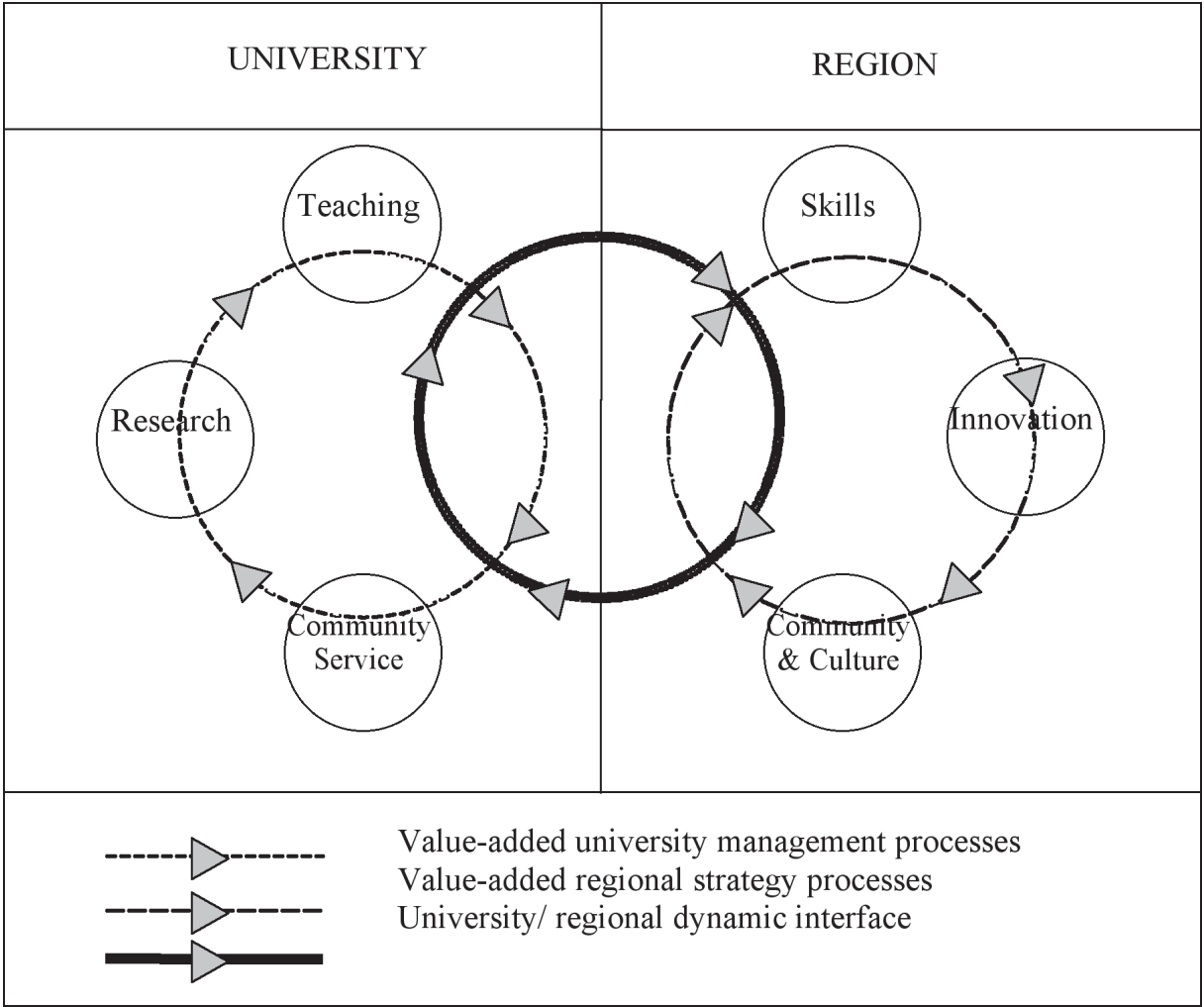
What Goddard & Chatterton (2003) contended was that there was no reason that universities assets could not support regional development activities, and vice versa, if their respective value-added management processes

were more systematically managed in parallel. Indeed, they pointed to a reality where that already takes place, albeit often on an ad hoc basis. Their argument is that if both sides of this partnership plan and manage their assets more collectively, this allows both the realisation of more synergies and collective benefits. This model is shown below in Figure 4.

What is necessary is for universities and regions to build up a capacity to better collectively plan activities. Goddard & Chatterton call this the university/ region dynamic interface, a formal body which exists to co-ordinate between regional strategy builders and university strategic managers. Implicit within their model are concrete areas of co-operation and co-development. What is important is strategies or platforms for joint working, but that joint working is delivered. Strategies are much easier to achieve in circumstances where there are tangible joint projects being worked on than beginning by attempting to agree a joint strategy then creating concrete projects

global players (OECD, 2007).

Figure 4 The university/ regional value-added management process



Source: Goddard & Chatterton, 2003.

This model has been critiqued from a number of perspectives, and subsequently development into the model used by the OECD report *Higher Education and Regions* (2007). It is worth rehearsing very briefly these critiques as to of understanding its limitations as well as the understanding why it has been developed.

The first point is that it is not really a model - it is more of a heuristic - because it does not indicate relationships between different model elements nor under which circumstances which kinds of activity are more desirable than others. The heuristic seems to fall foul of a critique which assumes rational partners will automatically strive for win-win situ-

ations from better strategic co-ordination. In reality, regional contexts are messy, characterised by strong personalities, rivalries and conflicts, and objective rationality cannot be assumed (Sotarauta, 2005; Benneworth *et al.*, 2010).

The second critique is that the model appears to be advocating a generative approach for university regional engagement emphasising the more efficient use of regional resources rather than considering more strategically alternative development pathways which might change demand and regional economic structure. Again, the empirical evidence suggests that where universities and regions work together strategically there is a tendency to try to change developmental trajectories, and there is certainly not a reversion to simplistic supply-demand co-ordination activities (OECD, 2007).

The final critique, one which requires more substantive treatment is that this model definitely falls into a 'scalar envelope', obscuring that regional partners are driven by external stimuli, barriers and dependencies. These can be dominant in determining what regional partners can achieve. As an example, national government policy or higher education legislation may constrain the boundary conditions for 'dynamic university-regional interfaces'. On the other hand, the model obscures the potential for universities to contribute to wider regional improvement by bring in external resources and placing them at the service of collective regional activities.

Nevertheless, the model is in understanding what benefits universities may achieve via regional innovation. By participating in collective regional activities, and *managing that participation* to optimise the university benefits allow regional innovation to strengthen HEIs' own teaching, research and community service activities. The model makes explicit clear that regional innovation's benefits must be reciprocal to be successful and that reciprocity must likewise be a goal for the 'dynamic university-regional interfaces'.

4.2 'GLOBAL PIPELINES, LOCAL BUZZ': UNIVERSITIES DRIVING SPILL-OVERS

So how can universities bring benefits to their regions through innovation, and how does this relate to universities own core activities which can in turn benefit from regional involvement? Gertler & Wolfe (2006) argue that *"non-local (inter-regional and international relationships are crucial sources of vitality, complementing the local buzz that has come to be regarded as the hallmark characteristic of the cluster"*.

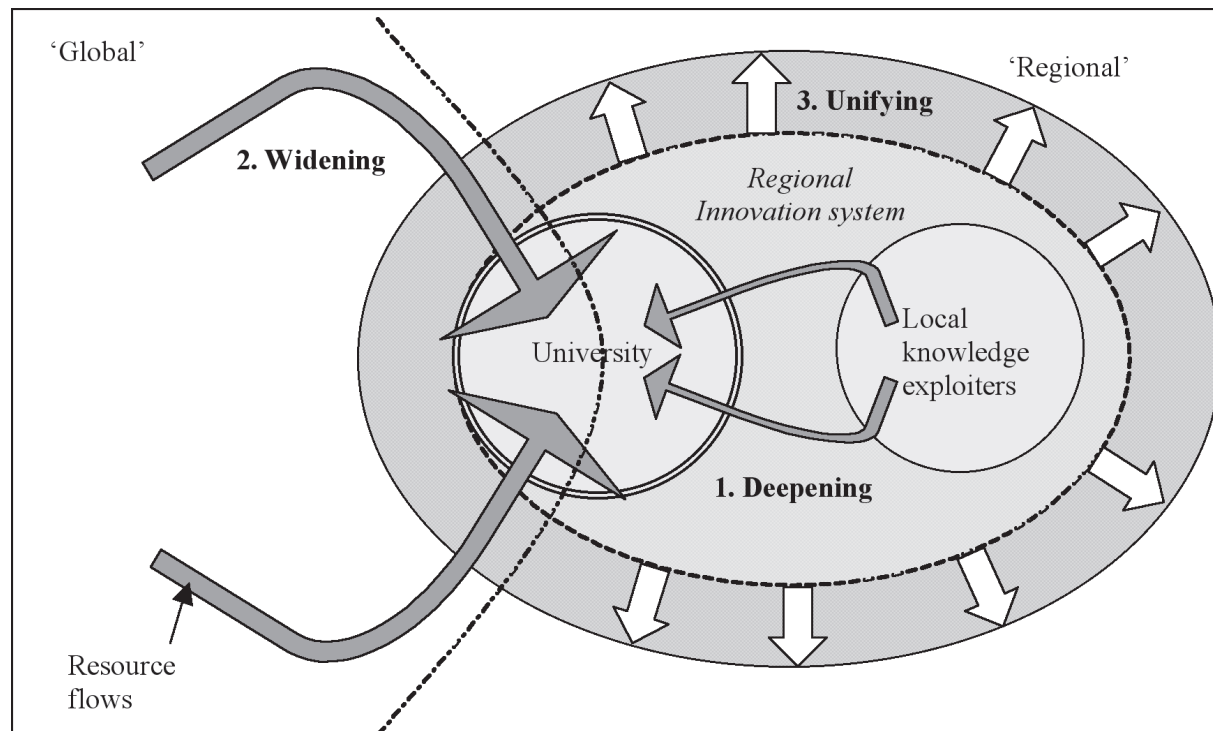
Bathelt *et al.* (2004) coined the phrase 'global pipelines, local buzz' to describe this situation, which refers to the fact, that from a regional perspective, universities can be considered as one important global-local connector. Universities' global pipelines, the way they bring people, resources and ideas from outside the region create a set of potential opportunities for a region. These resources can in turn cross-fertilise with local activities to create a sense of 'local buzz', that is to say that a region becomes the 'place to be' for solving particular technological or scientific problems (Gertler, 1995).

From work in Twente, the Netherlands and Scania, Sweden, Benneworth & Hospers (2007) and Benneworth *et al.* (2009) identify three mechanisms by which universities can improve their regional innovation system by acting as a global-local connector:

- Universities can build more connections to other region actors ('deepening' local buzz) and help to intensify knowledge exchange relationships which help to improve regional productivity and prestige.
- Universities can intensify the connections with external actors ('widening' global pipelines), bringing more actors into contact with the particular region, and placing their resources at the disposal of the region.
- Universities can improve the quality of regional decision-making ('unifying' global-local systems), creating regional coalitions who bundle their assets to create critical mass and international profile, making the region more attractive for external investors.

This situation is depicted in figure 5 below:-

Figure 5 University engagement's developmental impacts on RISs



Source: Benneworth et al., 2010.

The model is an iteration of the Goddard & Chatterton model, complementing their university-regional dynamic interface with dynamic interfaces between universities and their external partners. The challenge for the 'university-regional dynamic interface' is in ensuring that as many of the assets to which universities have contacts with through their various networks are attracted to the region and embedded in local activities. This is not trivial, and depends upon developing strategic coupling between local regions and global research actors with which universities have contacts and connections.

4.3 UNIVERSITIES' WORLDS OF STAKEHOLDERS

The challenge for universities and regional innovation is in developing shared common interests with local actors (Goddard & Chatterton, 2003) and global innovators (Yeung, 2009), holding together coalitions which develop 'projects' which help to support universities' core missions. However, this global-local characterisation misses a fourth important stakeholder group which is arguably most important of all for universities, and that is national government. When considering which stakeholders it is to which universities pay the most attention, there is a strong connection between funding and universities' attentiveness.

In unitary countries, where responsibility for research and higher education lies with national ministries (such as France, the United Kingdom or Sweden), the national governments are a key university stakeholder. In more federalised systems, research and higher education policies may be the responsibilities of different levels of government (e.g. Belgium), state and national governments jointly (e.g. Germany) or a complex multiple geometry defying simple characterisation (e.g. the US, Spain). Nevertheless, universities facing national demands is a general feature of the contemporary university condition.

But it is not just science and education ministries which regard universities as important partners for national policy (OECD, 2007). Universities have become involved directly in the delivery of a number of national policy areas: in the US, for example, the National Institutes of Health invests about \$32bn annually in health research, cross-subsidising basic universal health care in university hospitals, as well as investing in world class research

(Etzkowitz, 2007). An increasing interest by policy-makers in innovation as the centre-piece of productivity growth and economic development is widely promoted by multi-lateral agencies including the OECD, the European Commission, the Inter-Americas Development Bank, and the World Bank. Universities are seen as an important source of innovation, and are funded to apply their knowledge to create economic benefits.

Health and economic development ministries can be seen as relatively direct stakeholders for universities' regional economic development activities: health departments have an interest in medical workforces which universities educate, and departments of economic affairs may fund universities' technology transfer activities. Research and industrial policy are interconnected because governments can fund research to support strategic sectors without fouling fall of competition, state aid and trade rules: Spender notes how the US Advanced Technologies Programme was in effect a covert business support programme (1999). Sharp (1990) notes that the European Framework programmes, now a substantial funder of European higher education, had their roots in attempts to find an alternative industrial policy to subsidising declining industry.

Other countries place specific demands on their universities in other sectoral areas: Gilsing (2001) & Manshanden *et al.* (2002) highlight the role of the Ministry of Transport as a key HEI stakeholder as part of a long-standing Dutch pre-occupation with managing its roads and rivers. The rise of urban science policy has involved universities in urban, planning and housing policy objectives (Harloe & Perry, 2008; Benneworth *et al.*, 2010). In England in the 1990s, universities became enrolled in physical regeneration policy, firstly as recipients of new campuses and estates through the work of the Urban Development Corporations (responsible to the Department of the Environment), and then latterly, following changes to their financial regulations, through national and European regeneration funding.

Table 1 below highlights the range of stakeholder pressures to which universities are subject, distinguishing between international, national and local-regional pressures.

Table 1 Outline of different stakeholders in regional innovation and science activity

Global	National	Local
Global firms interested in co-development of new knowledge with universities	National policy-makers: Science: maximising efficiency of investments	Regional actors seeking to access national resources for own activities
Talented staff and students seeking to take the next step on their careers	Education: creating the skilled workforce of the future with fair costs	Regional development institutions promoting
Investors seeking new high-technology investment opportunities	Health: ensuring effective network of infrastructure with skilled staff and cutting edge knowledge	Skills: supply side support for regional businesses
Real estate companies creating profitable new science cities and knowledge parks	Economic development: minimising territorial disparities and creating opportunities for all	Innovation: supporting future high-growth businesses
	Industrial: ensuring survival of competitive strategic national sectors	Culture: maintaining distinctive regional high and low cultures
		Regional Science: as part of having strong cities and territorial competitiveness

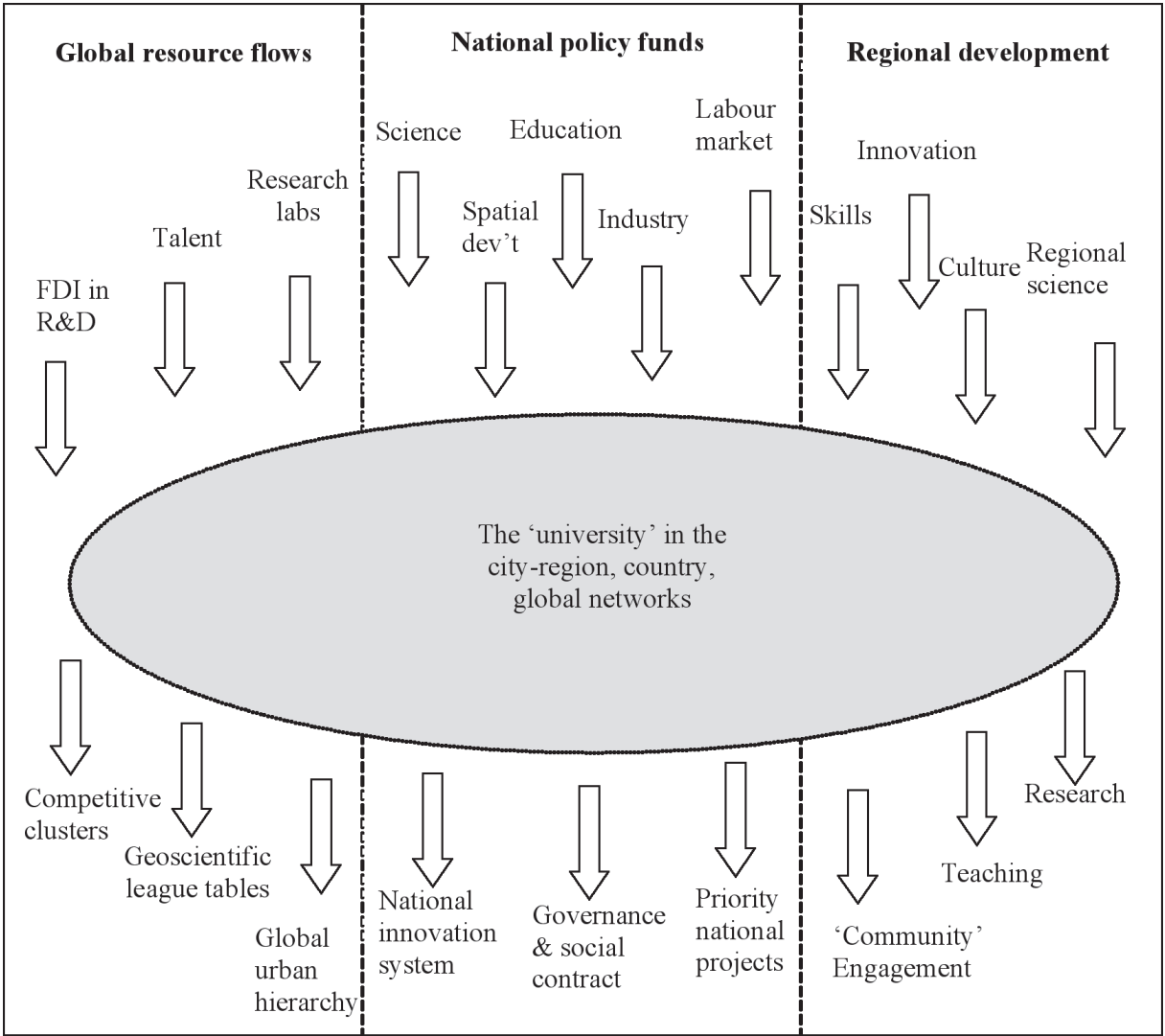
Source (OECD, 2007)

These pressures and demands create an environment within which universities are forced to operate. External stakeholders' interests are underpinned a desire to achieve some particular outcome in a region. The less de-

pendent stakeholders are upon a region, the less interest they have in working with the university to achieve that outcome. For national and international partners, there must be a strong common case that ‘strategically couples’ these actors’ interest of these actors to the region through particular projects that these external actors need to achieve their institutional goals.

Extending the models in figures 4 and 5, university and regional partners could work together to create activities that also raise the interest of external partners. Involving external partners and their investments can help contribute to regional spill-over benefits. External actors are not interested in the region developing but want to achieve their own goals: corporations are interested in profitability, market share, product lifecycles and technology roadmaps. Nevertheless, there are situations where local, national and external assets can be joined up together to deliver activities which simultaneously meet the interests and needs of multiple groups of stakeholders. This makes the university part of a regional network integrating resources from funders with a range of different interests to achieve common activities which produce a range of outcomes serving those diverse interests. Figure 6 represents this graphically.

Figure 6 The region as a place where different stakeholders try to realise their goals



Source: author’s own design

4.4 CONFIGURING REGIONAL INNOVATION TO CREATE GLOBAL-LOCAL BUZZ

Which model applies to which situation depends on the kinds of impacts and benefits being considered. More generative ones can be understood in terms of the Goddard & Chatterton model, such as how a particular activity such as graduate placements contributes directly to teaching and research, managed through a dynamic interface between university strategic managers and regional development agencies. This is relatively straightforward: involvement in regional engagement provides an immediate benefit to an institution which can be weighed against the costs and the efforts involved in that activity.

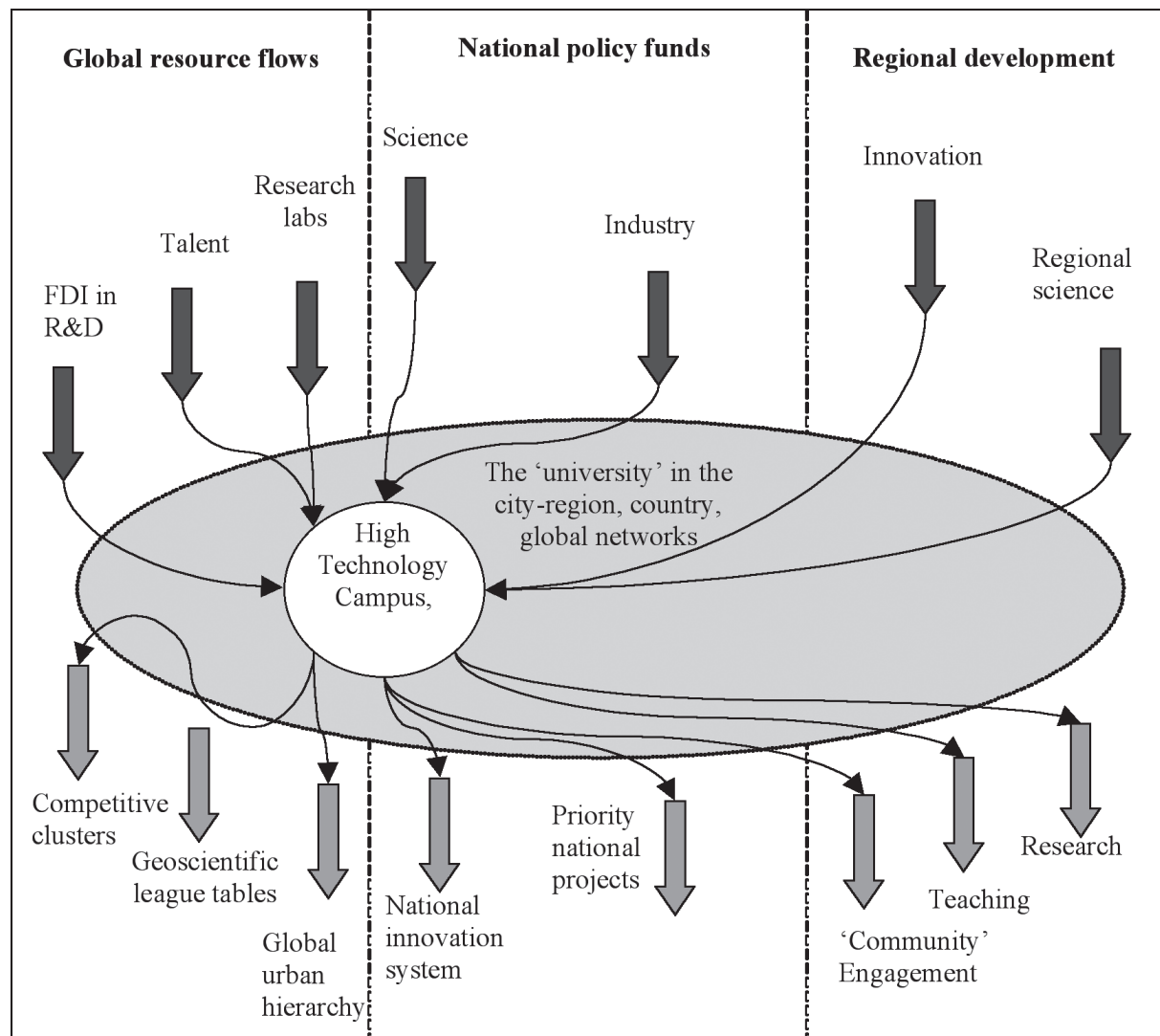
However, universities may find themselves in a position where they are urged to place more of an institutional effort into regional engagement to make more of their resources and their global connections available to regional partners. This may for example involve a comprehensive campus redevelopment funded by a mix of national and regional governments, by new corporate investors, research-intensive multi-nationals and the university itself. In order to attract private investors, such developments may involve making campus space available for new high-technology businesses. Universities may seek to access new appropriate accommodation, in bringing universities and businesses closer together, and helping increase the universities' regional business and economic impacts.

There is no simple way to decide whether a university should participate in such a proposal. But there is value for university managers in understanding that such projects must be understood as a mix of interests, desires and outcomes. Given the participating actors, and their goals and interests, is it possible to use these activities to genuinely strengthen the core businesses of the university. That analysis allows university managers to consider strategically what opportunities there are to capitalise on these new projects to stimulate their own institutional development. The arrival of a new R&D business in a location often helps persuades other investors and governments to fund complementary university R&D to create centres of excellence.

The regional innovation stakeholder approach provides a means for universities to consider whether they wish to involve themselves in emerging opportunities, or when faced with a force majeure how they can best deal with the issues. To illustrate this, we use an example of an archetypal regional science project where a new research site is created for businesses and universities to support business competitiveness and innovation. This kind of campus activity can be found quite widely, and a stylised example helps to illustrate how universities should understand competing stakeholder demands in strategically managing their flagship regional innovation activities.

An increasingly popular innovation activity is to create shared innovation activities where firms and universities co-locate in and around the university campus to create interactive spaces which promote innovation. This allows interaction between university researchers, spin-offs and established research groups. Infrastructure sharing allows younger companies to thrive and creates an innovative and creative environment that attracts new businesses. The existence of so many companies in turn helps to increase the attractiveness of the university to external talent, to talented staff because of the facilities and opportunities for cutting edge research with users, and for students because of the improved employment opportunities that this 'clusters' offer. The university can become through its high-technology campus an anchor point or node from global, national and regional resources, creating synergies which reinforce a set of activities which serve those different actors needs. This situation is represented in figure 7 below.

Figure 7 High-technology campus as a confluence of interests and investments



Thinking about the project in this way highlights the fact that there is a key tension between regional policy makers and international investors. Large urban-science activities tend to be relatively weakly strategically coupled to the region. The IDEON science park at Lund University has succeeded because of the prior presence of the AstraZeneca research laboratory, and because Ericsson created a highly experimental 'mobile telephony' research group of 20 employees in its Lund site in the mid 1980s. The science park at Leuven, Haasrode, was created in the wake of a Belgian Governmental delegation to America to try to copy the lessons of Research Triangle Park in North Carolina to revitalise the flagging Belgian economy, which made it the natural location for a set of strategic investments.

There is very little that regional partners could offer to the large companies to encourage those research groups to stay or to attract them from elsewhere. What strategically couples the private R&D investors to the region is the presence of the university both as a research partner but also as a provider of highly skilled graduates for the workforce. This results in a complicated network of interdependencies between participants in activities who each have their own goals and desires for the projects.

One thing which universities do is offer a regional anchor, ensuring that benefits will survive in the region even when private research and innovation investors may leave. It is not just universities' links with businesses which are important, but also the integrity of their research activities. If their research becomes too applied and loses its theoretical footholds, or becomes too specialised in terms of meeting the needs of current businesses, then this would erode the overall competitiveness of the institution.

The strategic issue for the university is in obtaining the resources to avoid either becoming over-specialised or applied on areas of interests to current businesses. Engaging with regional innovation only makes sense if there are clearly identified resources made available specifically to avoid this risk supporting research programmes with a wider applicability than exclusively those of the businesses present. Under such circumstances, regional innovation allows universities to engage with international firms very closely without worrying that this engagement will undermine their research excellence.

4.5 BEYOND SCIENCE PARKS: REGIONAL INNOVATION STRATEGICALLY ALIGNING UNIVERSITY AND REGIONAL ASSETS

Although the previous section has for the sake of clarity used an illustration of a science park involved with engineering and technology disciplines, the point must be reiterated that university engagement with regional innovation is not just about flagship science parks integrating university's technology transfer and research activities. The model can also be applied to better understanding regional engagement and innovation as something which can provide - under certain circumstances - additional resources for supporting activities across the range of subjects, disciplines and themes.

These do not have to be limited to technology transfer from the hard and life sciences. There are many other ways in which universities can get involved in flagship development projects in their region that both help to stimulate regional development whilst also providing a more stimulating and supportive environment for the university's own activities. There are a range of examples from the field of arts and culture where universities have engaged with city development strategies to create new cultural campuses with synergies between arts activities and infrastructure, and the universities' own activities in these areas. Some of these relate to the commercial exploitation of arts and humanities, for example in the digital and creative media industries, or software for translation, language recognition and smart systems. Liverpool Hope University has for example developed a new performing and creative campus in the poorest part of England's poorest city, Everton, which has drawn together European, national and regional regeneration funding, and now includes incubation space for businesses and voluntary groups in what was a relative arts desert a decade ago (Benneworth, 2010).

But engagement can also bring in resources supporting more abstract and less instrumental valuations of arts and humanities. One of the most successful examples of the Scottish Knowledge Transfer grant, for example, came in providing Scotland's universities with relatively small sums (€ 25,000 to € 90,000 per annum) to develop cultural engagement strategies which explained how their cultural treasures would support the Scottish arts sector. This viewed the arts sector partly in terms of its economic contribution (as a tourist asset, for example) but also as an expression of Scottish culture and identity in the post-devolution age. And at a time when having clearly identified partners and pathways is important in producing research impact, such linkages can to strengthen the university's overall performance.

Besides engagement in different kinds of disciplines, universities also have the opportunity to create new methodologies through regional innovation. There has been a growing dissatisfaction with the restricted nature of the idea of technology transfer; in part the idea of 'technology' is too restrictive given the disciplinary spectrum with which universities have regional impacts, the term knowledge transfer being preferred. With an increasing recognition of the importance of user involvement in contributing to research quality, knowledge transfer as a concept is seen as also being limited, ignoring knowledge exchange and co-creation, where universities and other parties work collectively on research projects creating a common knowledge pool which each party exploits for their own ends. Creating engagement sites facilitating knowledge exchange and co-creation can therefore create useful assets which improve the quality of teaching and research by universities which would not be possible without that engagement.

But at the same time, engagement beyond the base load of existing activity comes at a cost to universities, and universities need to be sure that regional engagement and innovation are helping to serve their direct needs. That means effectively understanding regional engagement, what strategic management can bring to regional engagement, and what practical steps exist for those universities wishing to reflect on their own regional engagement activities. It is to these three areas that the final concluding chapter now turns.

5. PRINCIPLES FOR EFFECTIVE REGIONAL INNOVATION

This report has been concerned how regional innovation fits with the wider agenda to reform higher education and place it more squarely and directly at the service of its societies. Regional innovation is one way in which universities can demonstrate their fulfilment of the societal compact, and yet the preceding discussion makes clear that some kinds of engagement are better than others. In this final chapter, we draw together some important threads together to create a conceptual and practical framework for understanding how regional engagement and innovation can contribute to modernising Europe's universities.

Three issues appear to be salient in creating such a framework for understanding university-regional engagement.

- Understanding the relationship between regional innovation and universities' core missions, particularly when there are such strong pressures for universities to focus on a particular mission, and even for profiling to see regional engagement as a task for a sub-set of HEIs rather than potentially appropriate for all.
- Appreciating the duality of the strategic management task, on the one hand optimising the 'base load' of regional innovation activity supported by universities but on the other thinking strategically about the opportunities which the regions offer for ongoing institutional development.
- Capitalising on existing activities and partners, because in practical terms engagement is not about developing a new mentality but rather on improving what is already done with regional partners, and drawing on partners support to develop institutionally.

Once these lessons have been digested and implemented, European HEIs will then be able to reinvent themselves as institutions central to securing the long-term economic prosperity, social cohesion and environmental sustainability for Europe as a whole.

5.1 REGIONAL ENGAGEMENT AS THIRD MISSION?

The first conclusion is that the framing of regional engagement and innovation as part of the third mission is potentially unhelpful. In situations where universities are under a range of stakeholder pressures, then those missions with most vociferous stakeholders become the most central activities. The notion of a 'third mission' suggests something peripheral to universities' core activities, hinting at an industrial liaison office or an engagement and placements centre. What the review and analysis highlight is that effective regional innovation involves exploiting emerging opportunities for societal engagement and networking within the knowledge economy, to improve the salience, relevance and quality of core tasks undertaken by universities.

This juxtaposition of relevance and quality may seem somewhat confusing, but the review makes clear that there are no practical or conceptual reasons why excellent research cannot also be societally useful. There are some disciplines which are more suited to engagement than others, between, for example, an astrophysics and an engineering department (Callon, 2002). But even astrophysicists are themselves funded by society, and must demonstrate their value to society. Science and the university enterprise are fundamentally about understanding the world and educating new generations with tools to understand the world. This makes contact with the real world is vital to these endeavours. It would be a very small, limited university indeed comprised entirely of departments with no potential for regional innovation.

Regional engagement is potentially a task for all kinds of universities - if not all universities. Dundas-Hewitt makes the point that in the UK it is the large, research-oriented universities that have the biggest impacts on their regional environments, precisely because of the size and breadth of their research and teaching activities.

Many of the regionally-engaged universities cited in this report, Twente, Lund, Leuven and Eindhoven are universities which as well as being engaged also score very highly in common international rankings of universities. Although some have argued that less research-intensive universities could compensate by being 'business facing' or regionally engaged, we contend that this is a false equivalence. Whilst some universities might choose to be less regionally engaged, the appropriateness of this is more related to institution own context, history and culture than whether they are more or less teaching- or research-intensive.

A final debate emerges given pressures facing contemporary governments arising from the financial crisis and the very difficult budgetary choices in its wake. On the one hand is a risk that some universities are freed from a responsibility to engage whilst others are compelled to give more weight to commercialisation. On the other, forcing universities to be more commercial in turn risks downplaying the longer-term benefits which universities bring their regions by developing longer-term and riskier projects whose regional innovation benefits are only evident in the longer run. Either of these tendencies could undermine the idea that regional engagement could help universities fulfil their societal compact, in turn vital to the survival of the institution of university.

5.2 STRATEGICALLY MANAGING REGIONAL INNOVATION ACTIVITIES

The second area relates to the strategic management of regional innovation activities by universities. The preceding discussion makes it clear that there are two separate management challenges for regional innovation which correspond to the regional generative and developmental impacts which universities can make. It is clear that universities make substantive contributions to their host localities, determined in part by their profile, and also by the demands of regional partners, regardless of the extent to which this is strategically managed. There is also the opportunity for universities to try to build stronger relationships with their regional partners, involving external partners to build up strategic assets that improve their own capacities. These involve very different strategic management challenges, in terms of the goals, the approaches and their riskiness for the HEIs.

One strategic management challenge relates to activities already underway within universities. There is a high level of certainty here in because there are already institution examples from which lessons - either positive or negative - can be learned. The question is how to optimise these activities, to maximise the benefits they bring to the university consummate with the efforts and risks involved. This may involve extending an experimental approach or curriculum from a department, research centre or faculty to the university as a whole. Questions therefore must be asked about whether increasing the scale of activities brings the desired benefits, which may include economies of scale from centrally organising activities previously managed at the faculty level. The approach will typically be identifying where the activity already works well in the institution, possibly in discussion with regional partners and applying the model institution-wide, with appropriate sensitivity for disciplinary variations.

This is an entirely different management challenge from attempting to undertake a flagship, developmental regional engagement or innovation activity. Because this involves changing the way that things are done and the nature of relationships between regional actors, there is a great deal more risk and uncertainty here. Because it is experimental and risky, universities must plan to prevent failed experiments creating structural problems for the university; investing in land for example for a new campus development should not jeopardise institutional financial survival if there are problems in successfully completing an urban science project. There is a different role here for regional partners: rather than being as clients or users for universities' services, universities need regional partners to share risks, allowing experiments the possibility of failure without devastating consequences for the university.

This means that a regionally engaged university could potentially have two very different kinds of relationships with regional actors, one more regulatory/ provider-client, and the other more collective and risk-sharing. If universities have a single point of contact with regional partners, then a distinction must be made between relationships which are based on more certain, contractual exchanges and those which are more collective and experimental.

One issue that we have not dealt with in this report for the sake of simplicity is inter-university relationships in (the majority of) regions that have more than one HEI. These can often be complex relationships with inter-institutional rivalries existing alongside an accepted need for universities to work collectively with regional partners. There is clearly a risk that such bodies, which may have such names as regional science councils, higher education regional associations, or innovation platforms lack the necessary flexibility to deal with competing and complementary relationships. These are complex dynamics which require careful management if both universities and regions are to obtain the greatest benefit from their activities.

Another issue is who are the region actors? In the report, we have assumed that there is a university-regional dynamic interface, and the university has the opportunity to work with a body which articulates the collective view of regional innovators as to how universities can best fit with regional innovation policy. There are two weaknesses which such a simplification makes, and it is necessary to be aware of at least two tensions which emerge from the fact that regional actors are not a coherent and consistent body.

The first is that different actors within a region may have different opinions - small business bodies may be critical of universities' failures to engage with them, whilst large firms may wish to see more research support going to firms rather than universities. The 'holy grail' of university-regional engagement is evidence-based consensus on priorities for actions. However, this may be very difficult to achieve, particularly in those regions with low levels of innovation and relatively little past experience in developing collective innovation and innovation support activities.

The second weakness is that talk of business demand, desires, needs or capacities often carries an assumption that business is a static entity. But firms are born and die, their interests evolve, and firms may move into or out of a region. The indications which universities may receive from a consultative regional forum may not correspond to the shifting environment within which the universities find themselves. There are strong risks to universities in tailoring their regional innovation support activities to a seemingly strong or high-potential sector if the firms in that region either move away or close down.

Likewise, where regional consultative bodies are supported by governments, the fact is that governments do change, and where those changes are party-political, incoming governments often choose to signal their arrival by imposing their own brand of regional innovation policy. Universities who allow themselves to become too dependent or reliant on the views or opinions of consultative forums lay themselves open to the risk that these bodies may be abolished, leaving them seemingly opposed to or out of favour with the new authorities.

5.3 BECOMING A REGIONALLY ENGAGED INNOVATIVE UNIVERSITY

The final consideration relates to universities managing their regional engagement activities to maximise the benefits and opportunities, and minimise costs and risk. There are a series of challenges and problems for institutions seeking to begin to strategically manage their regional engagement activities. A typical approach to improving university regional engagement involves writing a strategy, publishing policies and guidelines (covering things like intellectual property, building hire, staff and student volunteering, and participation in public life), allocating resources to encourage, stimulate and reward engagement, establishing performance indicators and targets, then monitoring progress towards the strategic goals.

The risk in such an approach is in creating an artificially big division between regional engagement and the activities in which the university is already engaged. Universities almost always have some kind of regional impact or footprint. The in seeking to create a strategic institutional framework, borrowing good practice from successful institutions, is overlooking existing examples of internal good practice, and critically, those people internally who understand how that particular university can engage regionally. That is not to say that strategic management of regional engagement should begin from what the university already does: that is a recipe for failing to really achieve any kind of improvement. But a first consideration must be to understand the environment in which the university is operating regionally, and the people that understand that environment are likely to be those staff with regional connections.

Another often overlooked resource in seeking to promote and support regional engagement within institutions are external partners, funders and stakeholders within the region. These partners can be involved in a number of different ways as universities seek to improve their regional engagement. The OECD project Universities and Regions used a peer review approach to validate universities regional engagement. Institutions drafted a self-evaluation which was then interrogated with reference to regional partners. One risk is however of a conflict of interest if regional partners and universities begin working together on collective flagship projects, and it is necessary to ensure that roles in these consultative processes are kept clear throughout.

At the heart of effectively managing universities regional innovation is having a clear vision of the potential benefits those activities will bring, the mechanisms by which those benefits will be realised, and a timescale against which performance and expectations can be evaluated. This is relatively straightforward in the case of direct benefits, such as bringing new funding or improving student recruitment. However, what is much harder to understand are the indirect benefits, and in particular, the way in which regional engagement and innovation allows universities to convincingly demonstrate their fulfilment of their societal obligations.

Those indirect benefits relate to the way that societal stakeholders themselves value universities activities and contributions. Effective regional innovation activity by universities is valued for what it contributes to solving the problems that regions face. Universities must publicise their success stories, and work with regional partners to ensure that their success stories are told and retold beyond the region. The final message is in ensuring that the university receives its rightful recognition and reward for contributing to more effective regional innovation as part of its wider societal benefits.

BIBLIOGRAPHY AND FURTHER READING

- Allen, M.** (1988) *The Goals of Universities*, Milton Keynes: Society for Research into Higher Education/Open University Press
- Alderman, N. & Thwaites, A. T.** (1992) *The Regional Dimension to the adoption of Innovations*, in P. Townroe, and R. Martin (eds) *Regional Development in the 1990s: The UK in Transition*, London: Jessica Kingsley.
- Arbo, P. & Benneworth, P. S.** (2007) *Understanding the Regional Contribution of Higher Education Institutions: A Literature Review*, OECD Education working paper 2007/09, Paris: OECD
- Asheim, B. T. & Isaksen, A.** (2002) *Regional innovation systems: The integration of local 'sticky' and global 'ubiquitous' knowledge*, *Journal of Technology Transfer*, 27 (1), pp. 77 - 86.
- Asheim, B.T.** (1996) *Industrial districts as "learning regions": a condition for prosperity*, *European Planning Studies* 4 (4) pp. 379 - 400.
- Bathelt, H., Malmberg, A. & Maskell, P.** (2004) *Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation*, *Progress in Human Geography* 28 (1), pp. 31 - 56
- Barnett, R.** (2000) *Realising a compact for higher education*, in K. Moti Gokulsing & C. DaCosta (eds) *A compact for higher education*, Aldershot, Ashgate.
- Baumunt, Z.** (1997) *Universities: old, new and different*, in A. Smith & F. Webster (eds) (1997) *The post-modern university? Contested visions of higher education in society*, Milton Keynes: Open University Press.
- Becher, T & Trowler, P. R.** (2001) *Academic Tribes and Territories Intellectual enquiry and the culture of disciplines*, Buckingham, The Society for Research into Higher Education & Open University Press.
- Bender, T.** (1988) *Introduction*, pp. 3 - 10 in: T. Bender (ed.), *The University and the City. From Medieval Origins to the Present*. New York/Oxford: Oxford University Press.
- Benneworth, P.** (2010) *University-community engagement at Liverpool Hope University: building social capital in the inner city?* Working Paper 4 "University learning with excluded communities" project, Newcastle-upon-Tyne, KITE.
- Benneworth, P., Charles, D. & Madanipour, A.** (2010) *Building Localised Interactions Between Universities And Cities Through University Spatial Development*, *European Planning Studies* (forthcoming).
- Benneworth P. S. & Hospers, G. J.** (2007) *Urban competitiveness in the knowledge economy: universities as new planning animateurs*, *Progress in Planning* 23 (1), pp. 3 - 102.
- Benneworth, P. S., Coenen, L., Moodyson, J. & Asheim, B.** (2009) *Exploring the multiple roles of Lund University in strengthening the Scania regional innovation system: towards institutional learning?* *European Planning Studies*, 17(11), pp. 1645 - 1664.
- Biggar, N.** (2010) *What are universities*, for Standpoint no. 24, pp. 76 - 79.
- Boekholt, P. Arnold, E. & Tsipouri, L.** (1998) *The evaluation of the pre-pilot actions under Article 10: Innovative Measures regarding Regional Technology Plans*, Report to the European Commission, <Accessed through CORDIS database>
- Boschma, R.A.** (2005), *Proximity and innovation. A critical assessment*, *Regional Studies*, 39 (1), pp. 61 - 74.
- Boucher, G., Conway, C. and Van Der Meer, E.** (2003) *Tiers of Engagement by Universities in their Region's Development*, *Regional Studies*, 37: 9, pp. 887 - 897.
- Brownrigg, M.** (1973) *The economic impact of a new university*, *Scottish Journal of Political Economy* 20 (2), pp. 123 - 139
- Brink, C.** (2007) *What are universities for?* Vice Chancellor's Lecture. Newcastle-upon-Tyne, 27th November 2007.
- Callon, M.** (1999) *The Role of Lay People in the Production and Dissemination of Scientific Knowledge*, *Science Technology Society*, 4 (1), pp. 81 - 94.
- Centre for Educational Research and Innovation** (1982) *The university and the community: the problems of changing relationships*, Paris: OECD.
- Charles, D. R. & Benneworth, P. S.** (2001a) *Expert or lobbyist - Universities, the new regional Agenda and London's Governance*, In R. Baldock & S. Syrett (eds) *Governing London: Competitiveness and Regeneration for a Global City*, London: Middlesex University Press.

- Charles, D. R. & Benneworth, P. S. (2001b) *The regional contribution of higher education*, London: HEFCE/ Universities UK.
- Christopherson, S. & Clark, J. (2007) *Power in firm networks: what it means for regional innovation systems*, *Regional Studies* 41 (9), pp. 1223 - 1236.
- Cochrane, A., Williams, R. K. & Brennan, J. (2010) *Higher education and regional transformations*, Something from the HEART programme!
- Coenen, L. (2008) *So near yet so far away: x*, Unpublished Ph.D. thesis, Lund, Sweden: University of Lund.
- Cooke, E. D. (1970) *Analyzing university student contribution to the economic base of the community*, *Annals of Regional Science* 4 (1), pp. 146 - 153
- Cooke, P. (1992) *Regional innovation systems: competitive regulation in the new Europe*, *Geoforum*, 23, pp. 365 - 382.
- Cooke, P. N. (1995) *Keeping to the high-road: learning, reflexivity and associational governance in regional economic development* in P. N. Cooke (ed) *The rise of the rustbelt*, London: ICL Press.
- Cooke, P. (2005) *Regionally asymmetric knowledge capabilities and open innovation: exploring 'Globalisation 2' - a new model of industry organisation*, *Research Policy*, 34, pp. 1128 - 1149
- Cooke, P., Heidenreich, M. & Bracyck, H. J. (2003) *Regional innovation systems: the role of governance in a globalised world*, 2nd Edition. London: Routledge.
- Dahlstrand, A. L. & Jacobsson, S. (2003) *Universities and technology-based entrepreneurship in the Gothenburg region*, *Local Economy*, 18 (10), pp. 80 - 90
- Delanty, G. (2002) *The University and Modernity: A History of the Present*, pp. 31 - 48. In: *The Virtual University? Information, Markets and Management* K. Robins & F. Webster (eds) Oxford: Oxford University Press.
- Dobrée, B. (1943) *The universities and regional life*, Twenty-fifth Earl Grey Memorial Lecture, Newcastle-upon-Tyne, King's College, 29th April 1943.
- Doutriaux, J. (2008) *Knowledge clusters and university-industry co-operation* in C. Karlsson (ed). *Handbook of Research on Innovation and Clusters: cases and policies*, Cheltenham: Edward Elgar.
- Elton, L. (2008) *Collegiality and Complexity: Humboldt's Relevance to British Universities Today* *Higher Education Quarterly*, 62, (3), pp. 224 - 236
- Etkowitz, H. & Leyesdorff, L. (2000) *The dynamics of innovation: from national systems and 'mode 2' to a triple-helix of university-industry-government relations*, *Research Policy* 29 (2), pp. 109 - 123.
- Etkowitz, H. (2008) *The Triple Helix: University-Industry-Government Innovation In Action*, London: Routledge.
- Fawcett, C.B. (1924) *The Provinces of England. A study of some geographical aspects of devolution*, (revised edition, 1961) London: Hutchinson University Library
- Feldman, M. & Desrochers, P. (2003) *Research universities and local economic development: lessons from the history of Johns Hopkins University*, *Industry and Innovation* 10 (1), pp. 5 - 24.
- Flexner, A. (1930) *Universities: American, British, German*, Oxford: Oxford University Press
- Florax, R.J.G.M. (1992) *The university: A regional booster? Economic impacts of academic knowledge infrastructure*, Aldershot, UK: Avebury.
- Florida, R. (1995) *Towards the learning region*, *Futures* 27 (5), pp. 527 - 536.
- Fontes, M. & Coombs, R. (2001) *Contribution of new technology based firms to the strengthening of technological capabilities in intermediate economies*, *Research policy* 30, pp. 79 - 97
- Gertler, M. (1995) *Being there: proximity, organisation and culture in the development and adoption of advanced manufacturing technologies*, *Economic Geography* 71 (1), pp. 1 - 26.
- Gertler, M. S. & Wolfe, D.A. (2006) *Spaces of knowledge flows. Clusters in a global context*, in B. Asheim, P. N. Cooke, & R. Martin (eds) *Clusters and regional development. Critical reflections and explorations*, Routledge, London.
- Gibbons, M, Limoges, C., Nowotny, H. Schwartzman, S., Scott, P., & Trow, M. (1994) *The new production of knowledge: the dynamics of science and research in contemporar societies*, London: Sage.
- Gilmore, H. (2009) *Hopes for national university shattered*, Sydney Morning Herald, 21st July 2009, available on-line at <http://www.smh.com.au/national/hopes-for-national-university-shattered-20090720-dquk.html>

- Gilsing, V. (2001) *Towards second-generation cluster policy: the case of the Netherlands*, in E. Bergman, P. Den Hertog, D. Charles, and S. Remoe (Eds) *Innovative Clusters: Drivers of National Innovation Systems*. Paris: OECD, pp. 361 - 376.
- Goddard, J. B. & Chatterton, P. (1999a) *The response of HEIs to regional needs*, Paris: OECD/ IMHE
- Goddard, J. B. & Chatterton, P. (1999b) *Regional Development Agencies and the knowledge economy: harnessing the potential of universities*, *Environment and Planning C* 17, pp. 685 - 699.
- Goddard, J. B. & Chatterton, P. (2003) *The response of universities to regional needs*, in F. Boekema, E. Kuypers, R. Rutten (eds) *Economic Geography of Higher Education: Knowledge, Infrastructure and Learning Regions*, London: Routledge
- Goddard, J.B., Charles, D. R., Pike, A., Potts, G. and Bradley, D. (1994) *Universities and Communities, Committee of Vice Chancellors and Principals*, London
- Goddard, J., Puukka, J., Duke, C., Dubarle, P. & Benneworth, P. (2007) as OECD (2007) *Higher education and regions: globally competitive, regionally engaged*, Paris, OECD/IMHE.
- Goddard J., Teichler, U., Virtanen I. & West P. (2000) *External Engagement and Institutional Adjustment: An Evaluation of the University of Turku*, Publications of the Finnish Higher Education Evaluation Council No. 3:2000, Edita, Helsinki
- Gray, M., Golob, E. & Markusen, A. (1996) *Big Firms, Long Arms, Wide Shoulders: The "Hub-and-Spoke" Industrial District in the Seattle Region*, *Regional Studies*, 30 (6), pp. 651 - 666.
- Greenhow, T. M. (1831) *The expediency of establishing an academic institution, of the nature of a college or university, for the promotion of literature and science, more especially amongst the middle classes of the community, briefly considered*, Paper read to the Literature and Philosophical Society of Newcastle upon Tyne, April 5 1831, 13 pp. Available in Newcastle University Library Archive.
- Greenwood, D. (2007) *Who are the real problem-owners*, in A. Harding, A. Scott, S. Laske & C. Bertscher (eds) *Bright satanic mills: universities, regional development and the knowledge economy*, Aldershot: Ashgate
- Gunasekara, C. (2006a) *Reframing the role of universities in the development of regional innovation systems*, *Journal of technology transfer* 31 (1), pp. 101 - 111.
- Gunasekara, C. (2006b) *Universities and associative regional governance: Australian evidence in non-core metropolitan regions*, *Regional Studies* 40(7), pp. 727 - 741.
- Gunasekara, C. (2006c), *Leading the horses to water: the dilemmas of academics and university managers in regional engagement*, *Journal of Sociology*, 42, pp. 145 - 163.
- Halsey, A. H. (1996) *British universities and intellectual life*, in M. Shattock (ed.) *The creation of a university system*, Oxford: Blackwell.
- Harloe, M. & Perry, B. (2008) *Universities, Localities and Regional Development: The Emergence of the 'Mode 2' University?* *International Journal of Urban and Regional Research*, 28 (1), pp. 212 - 223
- Hassink, R. (1993) *Regional Innovation Policies compared*, *Urban Studies* 30 (6), pp. 1009 - 1024.
- Hennings, G. & Kunzmann, K. R. (1993) *Local economic development in a traditional industrial area: the case of the Ruhrgebiet*, in P. B. Meyer (ed), *Local economic development*, London: Greenwood Press.
- Hobbs, D. (1991) *Business as master metaphor: working class entrepreneurship and business-like policing*, in Burrows, R. *Deciphering the enterprise culture: entrepreneurship, petty capitalism and the restructuring of Britain* (London, Routledge), pp. 107 - 125.
- Hyde, J.K. (1988) *Universities and cities in medieval Italy*, in T. Bender (ed.), *The University and the City. From Medieval Origins to the Present*. New York/Oxford: Oxford University Press.
- Jaffe, A. B. (1989) *The real effect of academic research*, *American Economic Review* 79 (7), pp. 957 - 70.
- Jones-Evans, D. Klofsten, M. Andersson, E. & Pandya, D. (1999) *Creating a bridge between university and industry in small European countries: the role of the Industrial Liaison Office*, *R&D Management*, 29, (1), pp. 47 - 56.
- Jongbloed, B., Enders, J., & Salerno, C. (2007) *Higher education and its communities: Interconnections, interdependencies and a research agenda*. *Higher Education*, 56(3), pp. 303 - 324.
- Keeble, D. (1997) *Small firms, innovation and regional development in Britain in the 1990s*, *Regional Studies* 31 (3), pp. 281 - 293.

- Kellogg Commission on the Future of State and Land-Grant Universities** (2000) *Renewing the Covenant: Learning, Discovery, and Engagement in a New Age and Different World*, National Association of State Universities and Land-Grant Colleges, Washington DC.
- Kline, S. J. & Rosenberg, N.** (1986) *An overview of innovation*, in R. Landau and N. Rosenberg, *The positive sum strategy*, Washington DC: National Academy Press
- Legendijk A.** (2003) *Towards conceptual quality in regional studies: the need for subtle critique - A response to Markusen*, *Regional Studies*, 37 (6/7), pp. 719 - 727.
- Landabaso, M.** (1999) *Innovation and regional development policy*, in R. Rutten, S. Bakkers, K. Morgan, and F. Boekema (eds) *Learning regions, theory, policy and practice*, London: Edward Elgar.
- Lawson, C.** (1999) *Towards a competence theory of the regions*, *Cambridge Journal of Economics*, 23, pp. 151 - 166.
- Lawton Smith, H.** (2000) *Technology transfer and industrial change in Europe*, Basingstoke: Macmillan.
- Levin, M.** (2007) *Knowledge and technology transfer: can universities promote regional development*, in A. Harding, A. Scott, S. Laske & C. Burt-scher (eds) *Bright satanic mills: universities, regional development and the knowledge economy*, Aldershot: Ashgate
- Longhi, C.** (1999) 'Networks, collective learning and technology development in innovative high-technology regions: the case of Sophia-Antipolis' *Regional Studies* 33 (4) pp. 333 - 342
- Lovering, J.** (1999) *Theory led by policy: the inadequacies of the 'new regionalism' (illustrated from the case of Wales)*, *International Journal of Urban and Regional Research*, 23 (2), pp. 379 - 395.
- Lundvall, B.-Å.** (1988) *Innovation as an Interactive Process - from User-Producer Interaction to National Systems of Innovation*, in Dosi, G. (eds.), *Technology and Economic Theory*, London, Pinter Publishers.
- Lundvall, B.-Å.** (1998) *Why study national systems and national styles of innovation?* *Technology Analysis and Strategic Management* 10 (4), pp. 407 - 421.
- Malecki, E.** (1997) *Technology and economic development*, London: Longmans. Nelson, R. R. (1993) *National Innovation Systems: a comparative analysis*, Oxford: Oxford University Press.
- Manshanden, W., Lambooy, J. & van der Vegt, C.** (2002) *The Netherlands: knowledge-intensive service markets in a small open economy*, in P. Wood (ed) *Consultancy and Innovation: the business service revolution in Europe* London: Routledge.
- Markusen, A.** (1994) *Studying Regions by Studying Firms*, *The Professional Geographer*, 46 (4), pp. 477 - 490.
- Markusen, A.** (1996) *Sticky Places in Slippery Space: A Typology of Industrial Districts*, in *Economic Geography*, 72, pp. 293 - 313.
- Maskell P and Malmberg A.** (1999) *Localised learning and industrial competitiveness*, *Cambridge Journal of Economics*, 23, pp.167 - 186
- Massey, D.** (1978) *In what sense a regional problem?*, *Regional Studies* 13, 2.
- McClelland, C. E.** (1988) *'To Live for Science': Ideals and Realities at the University of Berlin*, pp. 181 - 197 in: T. Bender (ed.), *The University and the City. From Medieval Origins to the Present*. New York/Oxford: Oxford University Press
- McNicol, I. H. /COSHEP** (1995) *The Impact of the Scottish Higher Education Sector on the Economy of Scotland*, Glasgow: Committee of Scottish Higher Education Principals.
- MacGregor, P.** (2009) *One of the papers from the regional economic impacts of HEIs programme.*
- Morgan, K.** (1992) *Innovating by networking - new models of corporate and regional development*, in M. Dunford & G. Kafkas (eds) *Cities and Regions in the New Europe*, London: Belhaven.
- Morgan, K.** (1997) *The learning region: institutions, innovation and regional renewal*, *Regional Studies* 31 (5), pp. 491 - 493.
- Moulaert, F. and Sekia, F.** (2003) *Territorial Innovation Models: a Critical Survey*, *Regional Studies* vol. 37 no. 3, pp. 289 - 302
- NESTA** (2006) *The innovation gap: why policy needs to reflect the reality of innovation in the UK*, London, National Endowment for Science, Technology and the Arts.
- Niosi, J. & Zhegu, M.** (2005) *Aerospace clusters: local or global knowledge spillovers?*, *Industry and Innovation*, 12 (1), pp. 5 - 29.

- Nonaka, I.** (1994) *A Dynamic Theory of Organizational Knowledge*, Creation, Organization Science, 5, pp. 14 - 37.
- OECD** (1997) *National innovation systems*, Office for Economic Co-operation and Development, Paris.
- OECD** (2009) *A review of regional innovation in Piedmonte, Italy*, Paris: Organisation for Economic Co-operation and Development.
- Oinas, P., & Malecki, E. J.** (2002) *The evolution of technologies in time and space: From national and regional to spatial innovation systems*, International Regional Science Review, 25(1), pp. 102 - 131.
- Perry B.** (2006) (ed.) *Building science regions and cities*, special issue of Regions 263, pp. 7 - 18.
- Phillipson, N. T.** (1974) *Culture and society in the 18th century province: the case of Edinburgh and the Scottish Enlightenment*, in L. Stone (eds) *The University in Society: Volume II - Europe, Scotland and the United States from the 16th to the 20th* London: Oxford University Press, pp. 407 - 448.
- Phillipson, N. T.** (1988) *Commerce and Culture: Edinburgh, Edinburgh University and the Scottish Enlightenment*, in T. Bender (ed.), *The University and the City. From Medieval Origins to the Present*. New York/Oxford: Oxford University Press.
- Piore, M. J. & Sabel, C. F.** (1984) *The Second Industrial Divide*, New York: Basic Books.
- Romer, P. M.** (1986) *Increasing returns and long-term growth*, Journal of Political Economy 94 (5), pp. 1002 - 1037.
- Romer, P. M.** (1994) *The origins of endogenous growth*, Journal of Economic Perspectives 8 (1), pp. 3 - 22.
- Salmi, J.** (2009) *The challenge of establishing world-class universities*, Washington DC: World Bank.
- Saxenian, A.-L.** (1994) *Regional Advantage: culture and competition in Silicon Valley and Route 128*, Cambridge MA: Harvard.
- Scott, A. J.** (1996) *Regional motors of the global economy*, Futures 28 (5), pp. 391 - 411.
- Sharp, M.** (1990) *The single market and European policies for advanced technologies*, in C. Crouch & D. Marquand (eds), *The politics of 1992: beyond the Single European Market*, Oxford: Blackwell.
- Shils, E.** (1988) *The university, the city and the world: Chicago and the university of Chicago*, in: T. Bender (ed.), *The University and the City. From Medieval Origins to the Present*. New York/Oxford: Oxford University Press, pp. 210 - 229.
- Simmie, J.** (1997) (ed) *Innovation, networks and learning regions*, London: Jessica Kingsley.
- Solow, R.** (1994) *Perspectives on growth theory*, Journal of Economic Perspectives 8 (1), pp. 45 - 54.
- Sotarauta, M.** (2006) *Where Have All the People Gone? Leadership in the Fields of Regional Development*, Sente Working paper 09/2006, Tampere, SF: Sente.
- Spender, J.-C.** (1999) *Publicly Supported R&D Projects: The US's Advanced Technology Program*, Science and Public Policy, 24 (1), pp. 45 - 52.
- Storper, M. & Salais, R.** (1997) *Regional worlds of production: the action frameworks of the economy*, Cambridge, MA: Harvard University Press
- Storper, M.** (1993) *Regional "worlds" of production: learning and innovation in the technology districts of France, Italy and the USA*, Regional Studies 27 (5), pp. 433 - 455.
- Storper, M.** (1995) *The resurgence of regional economies ten years later: the region as a nexus of untraded interdependencies*, European Urban & Regional Studies 2 (3), pp. 191 - 221.
- Temple, J.** (1998) *The new growth evidence*, Journal of Economic Literature, 37 (1), pp. 112 - 156
- Tobback, L.** (2009) *The relationship between the city and university in Leuven, Belgium*, Keynote speech to presented to Understanding and Shaping Regions: Spatial, Social and Economic Futures, Regional Studies Association International Conference, Leuven, Flanders, 6th-8th April 2009.
- Utterback, J. M., and Abernathy, W. J.** (1975) *A Dynamic Model of Process and Product Innovation*, Omega 3(6), p. 639 - 656.
- Williamson, O. E.** (1975) *Markets and hierarchies: analysis and antitrust implications*, New York: The Free Press.
- Yeung, H. W.** (2009) *Situating regional development in the competitive dynamics of global production networks: an East Asian perspective*, in H. W. Yeung (ed) *Globalizing regional development in East Asia: production networks, clusters, and entrepreneurship*, London: Routledge, pp. 1 - 31.



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