

# **Institutional Management and Engagement with the Knowledge Society**

by

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*The article will argue that external engagement with business and the community poses major challenges for the institutional management of Higher Education Institutions (HEIs). The world outside of academia, in business, central and local government, health, welfare and the cultural and community sectors increasingly expect an institutional as distinct from individual academic response to the challenges and opportunities for HEIs in their respective domains. Nowhere is this more apparent than at the city and regional scale where HEIs have the potential through their teaching and research to play a leading role in joining up the separate strands of development policy – such as innovation, skills, social inclusion – and providing a key link between the global and the local. But realising this external role requires strong institutional leadership and internal integration.*

*The article addresses these issues by reference to policy and practice particularly in relation to knowledge exploitation in Finland and the United Kingdom.*

## Introduction

This session [during the 2004 IMHE General Conference] has been given the title “New Knowledge, Research and Knowledge Creation” which suggest the focus should be principally on the exploitation of the science base by business. I will discuss this issue but argue that effective knowledge exploitation should embrace all of the functions of a university – teaching, research and community engagement (or so called “third strand” activities). I will adopt an economic development perspective which suggests that universities can and must play a key role in a development process which embraces business innovation, enhancing skills, culture and community cohesion. Indeed knowledge exploitation by technology transfer will only have a long run impact on economic development if the skills and community agendas are also addressed. I will argue that this holistic perspective on the needs of the wider society points to the requirement for a corporate response from the university as a key institution in civil society.

In adopting this developmental perspective, I cannot ignore the fact that in most OECD countries development is uneven. In these circumstances local and regional development agencies are increasingly looking to universities to play a leading role in achieving more balanced regional development. Whereas the traditional concern of Government was one of raising general educational levels and the output of scientific research, the emerging concern is to harness teaching and research to specific economic and social objectives. This specificity is most clear in the field of regional development. While universities are located in regions, questions are being raised about what contribution their teaching and research makes the development of the region.

I will seek to elaborate on this broad perspective by starting off with a brief review of the shortcomings of a narrow focus on knowledge exploitation using the example of science parks. I will then expand on the role of universities in the regional development process and conclude with some comments on the experience of two countries with which I am familiar, Finland and the United Kingdom.

Before doing so I should highlight a major common challenge that universities face in their external environment if they are seeking to become more actively involved as agents in the development process. This is the tension between four different domains of national policy, namely science and

technology, higher education, labour market and territorial development. While universities are ideally placed to join up these interrelated processes of development they often get contradictory messages from different parts of government which champion individual components such as knowledge exploitation and skills.

## **On Science Parks**

Science Parks are one of the earliest manifestations on the part of public authorities to exploit university research to further economic development.

A useful definition of science parks has been provided by the UK Science Parks Association. It is a property based activity involving first, formal operational links with a university; second, formation of knowledge based businesses on site; and third, a managerial function actively engaged in the transfer of technology and business skills to the enterprises on the site.

In an interesting review of the literature on science parks, Vestergaard points out that science parks are hoped to be a solution to complex political and economic issues in society, notably regional industrial development, under commercialisation of publicly funded research and a shortage of new product development (Hansson *et al.*, 2004). Science parks are seen as a means of achieving more effective exploitation of the science base by the co-location of researchers and businesses to facilitate networking between the two. This is often a key agenda in regions with a poor record of business innovation. In these circumstances the expectations laid upon science parks to tackle fundamental social, economic and cultural barriers to innovation are often very high.

However, Vestergaard and colleagues suggest that many science parks deviate from this idealistic model. First, from the perspective of large firms, they suggest that such enterprises do not see networking as a problem. They seek out the best and most relevant science wherever it is located in the globe. For them, intermediate organisations established on science parks to facilitate technology transfer from universities can act as a barrier. However, location on a science park can be an advantage in terms of recruitment of graduates as employees, who may then “transfer technology on legs”.

For small and medium sized enterprises the evidence in support of the positive effect on economic performance of the opportunities for networking with the science base provided by a science park is limited. Various studies of matched samples of firms on and off science parks have revealed little evidence of significantly enhanced performance of the science park enterprises. This may suggest that the key determinant is the characteristics of the entrepreneurs rather than the environment provided by the science park *per se*.

Finally, from the university perspective, if science parks are regarded principally as incubators for university based spin outs from which the university can derive economic benefits through equity holdings, then the evidence suggests that the financial contributions to universities from this source is limited.

In summary, Vestergaard and colleagues conclude that “the old role of science parks defined mainly by a linear conception of the relationship between science and innovation and as a provider of infrastructure in a broad sense (from laboratories to IT facilities) needs to be replaced by an inter-active, dynamic and network orientated understanding that emphasises learning”. To realise such an objective the customs and practices of knowledge exploitation through both teaching and research need to be embedded in the heartland of the university. The science park in effect needs to move “on campus”. If that does not happen there is a danger that the science park can be one of many means of keeping the messy world of knowledge exploitation “at bay” and protecting the academic heartland.

This perspective raises fundamental challenges for the management of higher education institutions and this challenge becomes most apparent at the city and regional scale. Here there are growing expectations on the university to become an active component in the learning region. So I now want to move on from science parks to consider the wider question of the engagement of universities with regional development.

The political drivers for university engagement with their regions is paralleled by economic drivers relating to the globalisation and localisation of the economy, corporate decentralisation and the growing importance to business of the quality of the local production environment. There is a parallel regionalisation of the regulatory capacity of the nation state with bodies such as Chambers of Commerce, and training agencies assuming a more significant role. Models of economic development now emphasise such concepts as “partnership governance”, the “soft” infra-structure underpinning development and the importance of “untraded interdependencies” between businesses within a locality (Amin and Thrift, 1994).

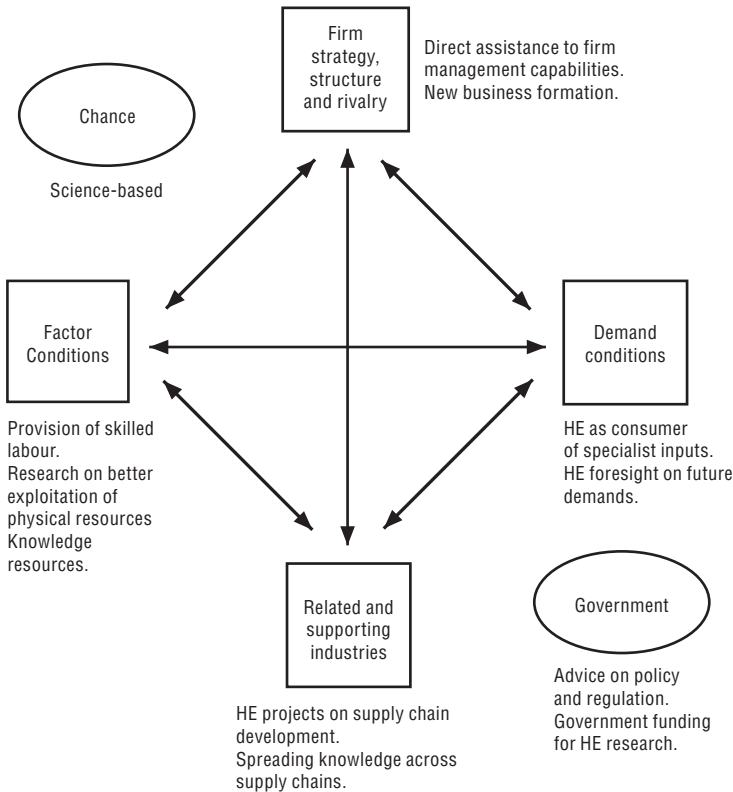
In terms of knowledge creation and exploitation there is a shift from what has been called “mode 1 knowledge creation” which is homogeneous, disciplinary and hierarchical to “mode 2 knowledge creation” which is non hierarchical, transient, trans-disciplinary and developed in the context of applications. (Porter, 1998) This involves a much closer relationship between the producers of new knowledge in universities and their partners in industry in a non-linear form of interaction, interaction which is most readily pursued at a local scale. Alongside corporate decentralisation this results in new local and regional clients for research and for graduates and a demand for work

based learning and tacit skills. In summary universities are expected to move on from playing a key role as “nation builders” to playing an active role in region building through partnership working. This perspective is most neatly summarised in the concept of the learning region. According to Richard Florida “to be effective in this increasingly global economy, regions must be defined by the same criteria and elements which comprise a knowledge intensive firm: continuous improvement, new ideas, knowledge creation and organisational learning. Regions must adopt the principles of knowledge creation and continuous learning: they must in effect become knowledge creating or learning regions”.

Similar perspectives underpin Michael Porter’s concept of the industrial cluster (Gibbons M. *et al.* 1994). This recognises that innovation is seldom isolated but is systemic with the industrial cluster acting as a reduced scale innovation system. Clusters encompass strategic alliances of universities, research institutes, knowledge intensive business services, bridging institutions and customers. Clusters success requires and encourages flows of talented individuals, including students and graduates, and the creation of vibrant and exciting places. My colleague David Charles has argued that universities can play a key role in the development of the famous Porter diamond (Figure 1). This takes place through science based discovery and new business formation; direct advice to firm to enhance the management capabilities; provision of skilled labour; acting as a consumer of specialist supplies; spreading knowledge to related industries down the supply chain and last but not least advice on policy and regulation to national and regional agencies. Within the cluster the university therefore assumes an entrepreneurial role and firms an academic dimension. The emphasis is on a spiral model of interaction using a variety of channels including research links (the creation of new knowledge); information transfer (selling existing knowledge) and people based transfer (students and staff) as well as the conventional spinout. In this model specialised centres and cluster discourse can provide a focus for both universities and the business community. It involves embedding engagement in the core business processes of both universities and industry.

Drawing on the learning region and cluster model of development suggests that regional engagement by the university must have a number of dimensions. First knowledge creation through research and its exploitation via technology transfer (spin out, IPR and consultancy). Second, knowledge transfer via teaching involving work based learning; graduate recruitment; professional development and continuing education. Third, students establishing the social relations on which knowledge exchange is built. Fourth, cultural and community development creating the milieu and social cohesion on which innovation depends. In summary, the university has a key

Figure 1. **Universities and clusters**

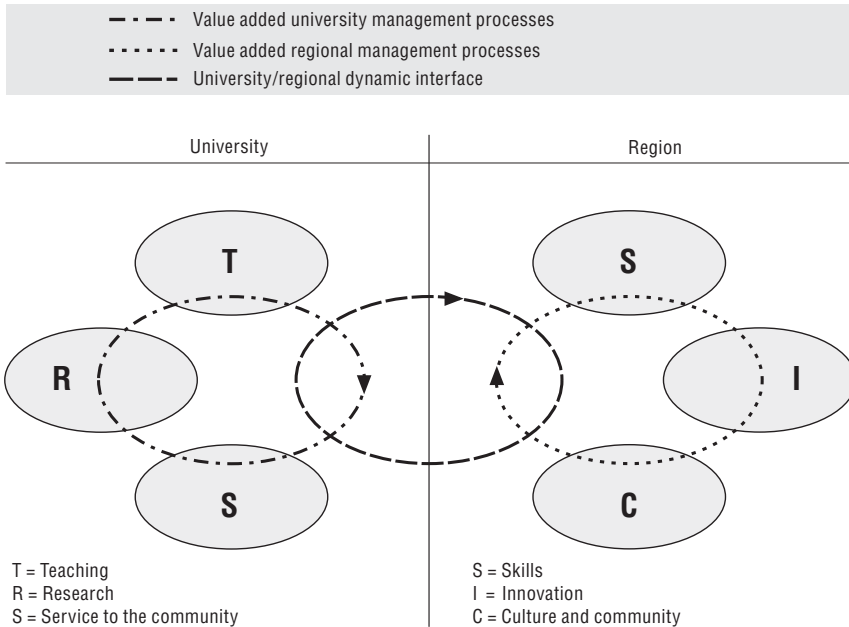


Source: Author.

role in local civil society, joining up separate strands of national policy relating to learning and skills, research and innovation, culture and social inclusion.

Figure 2 attempts to summarise this perspective. The left hand part of the diagram refers to the three roles of the university (teaching, research and service to the community). The right hand part of the diagram summarises three key dimensions to regional development namely innovation, skills and cultural and community cohesion. Just as successful regional development requires the drawing of these three strands together so the university’s effective engagement with the region involves bringing together teaching, research and service to the community in a coherent manner and establishing effective mechanisms for bridging the boundary between the university and the region. Indeed the university as a broadly based institution can play a leading role in drawing together the separate strands of regional development. Hence its critical role in local civil society.

Figure 2.



Source: Author.

This focus on the university as a key regional institution providing a corporate response to regional needs poses severe challenges for the traditional university. This is a contested terrain within academia. The strong management that regional external engagement requires can be seen as a threat to academic self governance. There are also connotations within the academic community of insularity and parochialism that could be associated with regional engagement. Moreover it could imply an instrumental and innovation endangering subordination to external expectations threatening the pursuit of knowledge for its own sake and with quality being sacrificed in the name of relevance. Similarly, critically challenging external views of society could be seen as being subordinated to serving external expectations. Finally, this could be seen as an agenda for some disciplines but not relevant to the university at large.

There are equally demanding challenges in relation to the world outside of academia in terms of the engagement of universities with their regions. Universities operate within multiple territories – local, regional, national and international. In contrast many of their external stakeholders such as municipalities and regional authorities operate in closed territories. In terms of higher education policy, regional engagement throws into sharp relief the

normative question of the appropriate role of different institutions within a given territory – that is which institutions should teach and research what and where. This challenge could be seen as a potential threat to institutional autonomy. It also highlights the tension between national higher education, science and technology and regional policy and the development needs of the region. This is because the university's potential role in territorial and development crosses the domains of separate national administrative spheres of responsibility. In short, it raises the question as to who in central Government is concerned with the role of a university in the development of a region as distinct from its location in a region.

This question in turn raises further challenges in relation to the role of universities in tackling problems of uneven development within national territories. The polarised nature of economic development in the “high tech” knowledge economy focusing on core regions and major cities is well known. Leading universities in these regions act as global players generating and transferring new knowledge. There is therefore an emerging global and national hierarchy of universities underpinning the hierarchy of cities and regions. In this situation new and established universities are being seen as “magic bullets” in tackling regional disparities. Just as in the limited case of science parks, too much expectation is being laid on universities to tackle problems of uneven development. The key challenge is one of establishing regional engaged universities with global standing to counter polarisation in the knowledge economy.

This emerging agenda of external engagement poses challenges for the profile and management of the traditional university. These have characteristically grown incrementally with some strong parts and some moderate elements but gaps in key areas relevant to regional development opportunities. Their governance structures usually support dispersal of responsibility, initiative and heterogeneity of substance in teaching and research. The emphasis is on disciplinary and producer led research and teaching and indeed a growing separation of these two domains. Insofar as external engagement is taking place, the academic heartland is protected by specialist units dealing with technology transfer and continuing education. However, the external engagement agenda outlined above requires institutional responses, co-ordination and transversal mechanisms. If the traditional university is to play an active role in regional development it must therefore initiate a process of institutional adjustment to enable it to both respond to and shape the development of the wider society. Such an adjustment is not necessarily a downgrading of aspirations to solely react to local needs but involves the creation of mechanisms linking the locality to the global body of scientific and cultural knowledge. Indeed local and regional engagement can become a crucible which a more dynamic university can be forged.



## On Finland

Finland is actively engaged in further refining its already highly successful science and technology policies to ensure that universities and regions all contribute to national competitiveness. The arguments are clearly set out in the triennial review undertaken by the Science and Technology Policy Council entitled *Knowledge, Innovation and Internationalisation*.

The report notes the success of Finland “in combining extensive production and economic utilisation of knowledge and know-how with other aims, such as the promotion of welfare and sustainable development (p. 1). It notes “employment rates must be raised and regional development balance” (p. 1). More specifically it states:

“Education, science, technology and innovation policies must be able to support and also guide regional development to ensure that measures taken at the national and regional levels reinforce each other. The challenge is to raise the knowledge and know-how and their utilisation to a level which withstands international competition in all regions while further strengthening their natural strengths. The issue in terms of national higher education policy is to merge this and regional development policy together in a national and expedient way. The aim is to achieve internationally higher quality, and structural development is required to meet this goal. The danger in a decentralised higher education system is that it is dispersed into increasingly small and numerous units. Higher education units must be sufficiently large and versatile to achieve their aims. Universities must carry on defining their profiles, and small polytechnic units must be combined into larger multi-field entities.” (Science and Technology Policy Council, 2003, p. 32)

The Science and Technology Policy Council does however highlight the challenge for the universities themselves in participating in this agenda.

“One major question is how the university as an institution will be able to manage the pressures and growing expectations directed at it with regard to social, cultural and economic development – whether the university has the internal capacity for renewal needed to lighten its work load in the face of constant new challenges. The traditional mission of the university is to promote free research and scientific education and to provide higher education based on research. The burning question in today’s debate is how to include the duty to promote the utilisation of new knowledge in the Universities Act as the university’s third mission. This question arises from both the growing expectations directed at universities by the users and from the legislative issues involved in efforts to reconcile the university’s administrative culture, business and research ethics. The need to address these questions in tangible, because

the change taking place in universities' mission and funding structure is systemic, shaking up the institution to its core". (*Ibid.* p. 19)

"A new challenge for universities and the whole research system is to be able to combine in-depth specialised knowledge with versatile expertise for the benefit of users and in contract research and in joint projects with them. A question partly relating to this is the future of higher education on the whole: how its different parts will take shape jointly and separately. Universities must have the possibility and capability for organising their economy and administration in a way which will enable their actual operations to develop flexibly. Ultimately the question is how the university itself promotes the education of good teachers and competent researchers, their career prospects in the university and their recruitment outside the university. Success can be seen in the capacity of the university to create dynamic operational environments." (*Ibid.* p. 37)

The Science and Technology Policy Council report has been quoted at length for two reasons. First, because it highlights how regional engagement, the third role of universities, and institutional management are inter-related. Second, because the quotations indicate the complex interplay between science and technology policy, higher education policy and regional development. Finnish science and technology policy has indeed developed a regional dimension, chiefly through the work of the Centres of Expertise; however, it is first and foremost a national policy implemented through universities and other institutions located in particular places. Likewise higher education policy is national; for example the universities in Eastern Finland, while founded in a period of re-distributive regional policy, have of necessity been establishing their national and international position in research and teaching. But at the same time they are being challenged to be active players in the development of their regions, arguably before the national policy framework for this activity has been sorted out.

How have these challenges been met at the level of the individual institution? As part of a comparison of the promotion of university interaction with business in Finland, Sweden and the United Kingdom, Copenhagen Business School conducted a case study within the University of Helsinki (Institute of Management, Politics and Philosophy, Copenhagen Business School, 2004). The researchers conclude:

"In this case study all the elements for a successful commercialisation of research results were present. National policies were favourable, public funding for R&D, as well as for capital investment was provided. The central management of University of Helsinki was keen to promote commercialisation of its research and had started already in 1997 formulating its policies and creating entrepreneurial support structures.

Finally, an internationally renowned academic had developed a research programme with strong commercial potential, and had a dedicated group with her, determined to bring their research to market. Yet, the process of spinning out the company was everything but smooth. The difficulties and conflicts described in the case study should not be seen as exceptional; as merely an incidental conflict between two individuals with dislike for each other. On the contrary, the two persons (head of department and research group leader) embody each their rationality, and their conflict is the conflict of those two rationalities, played out in the everyday life of a university department. It is the rationality of academic entrepreneurship against the rationality of academic purity. At present, they each have their own policy patron: science and technology policy on one side, and higher education policy on the other side. Policy-makers need to resolve this opposition. Fundamentally, policy-makers need to rethink the rationality of academic purity. Why is it that an entrepreneurial researcher should not use university resources and thus indirectly taxpayers money to establish a spin-out company. What's the moral difference between using taxpayers money to fund industrial R&D (through Tekes), and using them to fund the commercialisation of research in universities? Why is the latter inappropriate and the former not? We talk so much about the knowledge economy, about research-based innovation etc., but how are these ideals and visions to materialise, when the only actors whom we seemingly cannot permit to benefit from it – the universities and their researchers – are the ones we expect to run with the ball?"

In their review of international best practice, the Copenhagen Business School stress that "a key component of the Finnish approach has been a high degree of integration of policy making across a number of key policy areas, including science, innovation, industrial and economic policies. There is, however, in this co-ordinated policy making, a missing link: namely higher education policy". They note that the Ministry of Education guidelines for how universities should generate research based entrepreneurship embody "fundamental ambiguities" (Box 1).

The researchers conclude:

"That university entrepreneurship is on one hand encouraged, and on the other hand illegalised: university funds should not be used for new business activities and entrepreneurship activities should not compete with teaching and research as the prime activities of universities. Universities are encouraged to promote research-based entrepreneurship, but it is also made clear that any substantial allocation of funds and/or resources in terms of working hours is illegal. This construal of a fundamental opposition and conflict of interest between the traditional

**Box 1. Ministry of Education Guidelines  
on University Business Activity**

1. Universities should promote research-based entrepreneurship, that is i) compatible with university's mission and objectives, ii) compatible with strategy and main activities, iii) not in conflict with main purposes.
2. University's funds should not be used for the development of new business activities.
3. University's liabilities and guarantees should be clearly defined in contractual agreements.
4. Attention should be paid to possible conflict of interest between researcher and entrepreneur.
5. Attention should be paid to possible disqualification due to conflict of interest of a researcher/entrepreneur in specific research topics/projects.
6. Entrepreneurship activities should not compete with the teaching and research as the prime activities of universities.
7. The procedures of permission for secondary occupation/perquisite position should be followed.
8. Confidentiality aspects in contract research need more attention.
9. University employees or students as participants in entrepreneurship activities should not receive any monopoly rights.
10. University name and logo should not be used in entrepreneurship activities by private researchers/entrepreneurs.

Source: Mäkipää 2003.

missions of universities – research and education – and the new third mission – promoting the utilisation of new knowledge and contributing to the economy – is highly problematic. Framed in this manner, university entrepreneurship seems to be alienated from the outset, rather than being taken as a truly a new mission for universities.”

**On Turku**

How has Turku University responded to the general and specific challenge that I have outlined? Significantly, under the aegis of the Finnish Higher Education Evaluation Council, it has undertaken two self evaluations and international peer reviews focussed on its external engagement. (Goddard et al., 2000, 2003) The response of the Rector to the follow up peer review

highlights the tensions in higher education policy that I have already outlined at the level of the individual institution. He writes:

“Here at Turku University we are experiencing every day these growing demands. It would be fine if we would receive more funds accordingly. It also would be fine if we could discontinue some not so important activities. This is not easy because of the historical burden (‘that and that discipline has always been here’). The new University Law which should become effective in 2005 favours clearly the entrepreneurial aspect or the third task of the universities – even too much from a comprehensive university’s, like Turku University, point of view. There are some good suggestions (like permitting the universities to act as shareholders and to manage funds which are not directly in the university budget, etc.)”

“Having said this, the University of Turku, has other duties than the third task alone. Internationalisation, together with the high quality of research and teaching, is crucial for our external impact also in our own region.”

“Consequently the long term basic/core funding must form the basis for creating dynamic operational environments. If there could be some improvement in the future the University itself as well as the Rector and others should have courage to channel those funds innovatively – and not automatically based on ‘historical reality’. However this requires greater autonomy for the University. The Finnish Universities’ Rectors’ Council has for some time requested more economic autonomy for the universities and there are some fairly modest steps toward that goal in the new University Law draft.”

Following the suggestion of the initial peer review, the university established a University Research Council to have oversight of its research strategy and policies relevant to the management of financial, human and physical resources to support research. It was recommended that the council should not be a top down planning body but ensures that the conditions are right to foster entrepreneurial research based activities in all the faculties and supported by all parts of the central administration. A key task of the Council was to generate “headroom” funds to invest in strategic initiatives to fill the pipeline that would generate new economic activity, including the retention of key researchers.

In practice it has not been possible to create this headroom funding. The inter-relationship between the externally funded activities with the academic heartland of the university, including issues of strategic financial and human resource management remain a challenge in relation to the maintenance of the research infra-structure, selective funding of areas of strength and addressing administrative barriers to inter-disciplinary research. As in most research intensive universities work with industry and commerce is done by individual

units each marketing their own specialist capabilities. These units are insufficiently networked to share systemically information about firm needs and maximising the scope for collaboration in meeting these needs. Support for industry through work based learning, technology transfer and continuing professional development and generally shaping the business environment within South West Finland remains to be co-ordinated across the whole institution. Indeed the peer review team were told in their first visit that the success of Bio City Turku and Turku Centre for Biotechnology are in part because they are outside the normal administrative procedures of the universities.

## On the United Kingdom

There are both similarities and differences between the United Kingdom and Finland. Both are highly successful in terms of the quality of their scientific output measured in terms of citation indices and both are concerned about the return to the economy from the investment in university based research. For example, the UK Treasury commissioned a major review of Business – University Collaboration (*The Lambert Review*, Lambert, 2004). Both are highly centralised countries in terms of economic development but with universities expected to play a key role in the more peripheral regions. The degree of autonomy of institutions and explicit Government support for external engagement is much greater in the United Kingdom, although even here there is some ambiguity about the role of universities in contributing to more balanced development.

To be more specific the Higher Education Funding Council for England provides a funding stream to support third stand activities, currently labelled the HEIF under which funds are awarded to individual institutions on a competitive basis. The Lambert Review recommended that:

“Third stream funding should be substantial, permanent and allocated in a way that enables universities to make long term plans for these activities.”

“Third stream funding support regional shared services in technology transfer.”

“Increase in the level of proof of concept funding.”

“Give Regional Development Agencies targets that promote business – university collaboration.”

“Create a significant new stream of business relevant research funding.”

This last recommendation is particularly significant as third stream funding is dwarfed by funding provided to support research excellence determined by peer review through the national Research Assessment Exercise (RAE). This funding is heavily concentrated in London and the South East region with four institutions (Oxford, Cambridge, Imperial College London and University College

London) receiving one third of the funding from this source. Other funding, for example for research infrastructure and from the research councils, parallels these allocations. More significantly, the allocation of HEIF funding does not recognise that universities in the peripheral regions face a greater challenge in knowledge exploitation than those in the South of the country. In short, while the higher education policy environment supports autonomous institutions to become engaged in knowledge exploitation, it does not recognise that universities have a role in tackling problems of uneven development.

In contrast to the area of higher education, the United Kingdom does have a regional policy sponsored by the industry and territorial ministries. Regional Development Agencies are funded differentially to recognise regional disparities. In response to a Treasury review of these disparities the agencies responsible for the three Northern Regions have launched an initiative entitled “The Northern Way” in which the universities are playing a leading role through their regional associations. As an initial contribution to the Northern Way agenda, the three Northern higher education associations identified eighteen proposals for consideration as a potential pan regional initiative (Appendix 1).

Three main areas have now been prioritised where additional resources would have most significant impact on Northern economic development – the Northern Science Initiative: Centres of Professional excellence and Higher Level Skills Enhancement. How this collaborative initiative will pan out in the higher education policy environment which foster competition between institutions regardless of their locations, remains an open question.

## On Newcastle

I will end with some reference to my own institution, which has many parallels with Turku. It is a research intensive university with a medical school that had its roots in the local economy but has successfully become a national and global institution. It is now seeking to re-engage with the city and the region. Restructuring designed to raise its competitive position globally has had a strong local component. A revised mission statement is to be “A world class research led educational institution playing a leading role in the economic, social and cultural development of the North East of England”. A significant restructuring of the university faculties and departments has taken place to introduce greater clarity in the academic management hierarchy and to ensure an ability to respond corporately to the needs of business and the community.

The university has a comprehensive business development strategy with the following five themes:

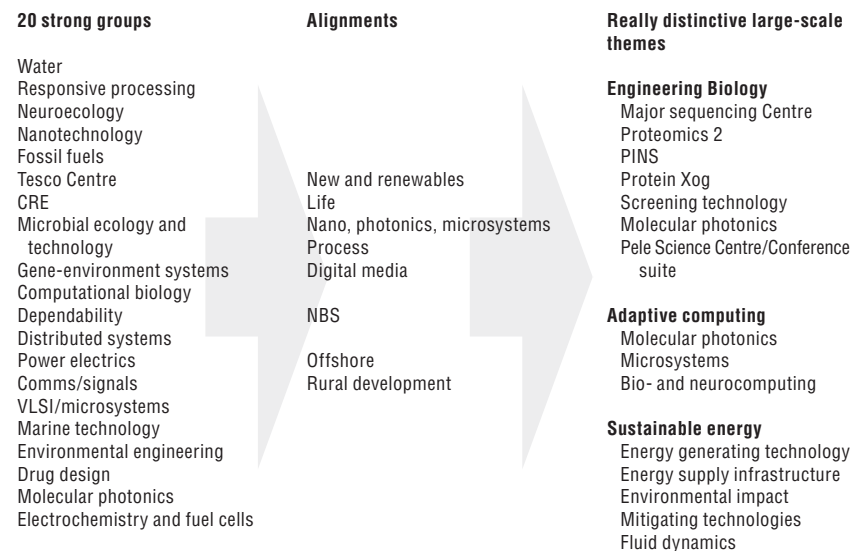
1. Enhancing devolved business development to embed third strand activity in three new faculties.

2. Enhancing the commercialisation of intellectual property through specialist advice.
3. Developing consultancy, commercial services and continuing professional development.
4. Building collaborative links in technology transfer with other universities in the region.
5. Creating enterprising staff and students by developments within the curriculum and work with alumni.

One of the faculties, Science, Agriculture and Engineering has undertaken a mapping of its research strength into the five Centres of Excellence in knowledge exploitation established by the Regional Development Agency as part of its Regional Economic Strategy (Figure 3). These centres aim to link actual and potential strengths in the regional economy with the research base and embrace:

- Digital technology and media.
- New and renewable energy.
- Process industries.
- Nanotechnology, photonics and micro systems.
- Life sciences.

Figure 3. **University of Newcastle Faculty of Science, Agriculture and Engineering**



Source: Author.



The faculty's research strategy is to ensure a coherent programme of long term R&D on major themes that will fill the pipeline of knowledge exploitation into the future. A further key strategy is bringing interaction with business onto the university campus. This is well exemplified by the Institute of Nanoscale Science and Technology (INSAT) and its commercial arm (INEX). The key elements in the INEX strategy are:

- Providing external users from industry, academia and government with access to a dedicated bio-hybrid and micro-nanofabrication facility (cf. "embedded teams").
- Employing a dedicated team drawn from industry to run and manage the facility.
- Mapping INSAT capabilities with industrial needs.
- Providing continual professional development courses (from short two-day highly specialised programmes to longer courses).
- Setting up as a one-stop shop for licensing and investment opportunities.
- Acting as a focal point for academic staff to exploit their investigations and developments.

In reviewing the university's strategy and comparing it with a more conventional science park in Copenhagen (Symbion) the Copenhagen Business School concludes:

"The danger is, in brief, that by building intermediary institutions such as Symbion, we may in fact institutionalise and cement a low interaction between higher education institutions and industry. By creating these intermediary institutions we produce the illusion of bridging the gap between science and economy, while in fact such intermediaries contribute significantly to keeping the institutions of science and economy apart. This brings us to the key strength of the Newcastle model. Here the vision is not to transfer certain research results with particular commercial potential from the university to the regional economy, rather it is to make the university itself an active player in the regional economy, in other words to place the university 'at the heart of the regional economy'. A fundamental difference between this and the traditional model is that the latter is tailored to help commercialise research, whereas the Newcastle model seeks to build an institution that is capable of producing commercialisable research. The traditional model is tailored to help new entrepreneurs commercialise research-based technologies, while the Newcastle model seeks to make entrepreneurs of students and commercialisable technologies of research."

However this agenda is not without its problems. For example, the Centres for Excellence is supported by the RDA have their own targets and run

the risk of a problem identified by the OECD in its 2002 review of the UK Science and Technology Base namely:

“A relatively large infrastructure of intermediate organisations has developed in response to successive initiatives [...] the issue at stake is whether excessive emphasis on specialist transfer agencies could monopolise knowledge flows and act as a barrier to the creation of a positive knowledge culture diffused throughout the industry – science nexus. In other words, is there a risk of consigning industry science relations to peripheral units.” (OECD, 2002)

## Conclusion

In this presentation I have concentrated on knowledge exploitation from scientific research and have said little about the role of teaching and the contribution of the social sciences and humanities. One of the most successful schemes for technology transfer in the United Kingdom has been the Teaching Company Scheme under which postgraduate students work 50/50 between the university and the partner company. Many universities have workplacement schemes as part of their teaching programmes and many run modules to develop enterprise skills. Some have developed student volunteering programmes to support the community and voluntary sector. And last but not least many play an active role in the local arts and cultural arena, ensuring the universities contribute to the creation of vibrant places that attract and retain innovative people.

The very breadth of this agenda makes it a challenging one for university managers and external funders. It crosses the functional portfolios of vice rectors and interacts with the concerns of a wide range of external stakeholders. Many of the areas have no obvious performance metrics nor is the impact of external engagement on the bottom line of the university accounts obvious in the short run. But if in the long run universities are to continue to act as key institutions in civil society their managers must come to grips with the need to actively engage with the economic, social and cultural development agendas of their communities.

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## APPENDIX 1

### **Northern Universities proposed contributions to the “Northern Way” agenda**

1. Identifying and sharing best practice in HE interaction with their host towns and cities; for example in:
  - Estate strategies.
  - Student and staff volunteering in local communities.
  - Sharing of facilities (cultural, sports etc.) with a view to developing enhanced engagement.
2. The identification of the potential capital projects in HEIs in the North with specific urban regeneration benefits.
3. Identifying and sharing best practice in HE interaction with, and support of rural regeneration; for example in:
  - The development of satellite campuses.
  - Institutional collaboration.
  - FE/HE partnerships.
  - Virtual delivery.
4. To consider the most effective ways of promoting and developing science within the northern HEIs in support of northern economic development, including:
  - Reviewing the effectiveness of existing arrangements.
  - Analysing the merits of a single northern science and industry council.
  - Arrangements for direct interaction between HEIs and industry, for example with a view to with a view to secondments.
  - Promotion of existing HEI centres of excellence to business.
5. To consider mechanisms for optimising the knowledge transfer from northern HEIs to the business, public, community and voluntary sectors across the whole of the North in relation to culture, social and economic science, health and humanities, and for developing this knowledge base in response to the needs of the North.

6. To foster an increased number of collaborations between researchers across the northern region, building on the existing areas of collaboration and institutional research development strategies, with the objective of:
  - Increasing a proportion of research council funding going to the northern HEIs.
  - Increasing the value of public sector voluntary and business sector research contracts based with northern HEIs.
  - Assisting the development of world class expertise in emerging research areas across the whole of the northern HEI community.
7. Partial integration of knowledge brokerage services in the three regions. This would be particularly effective in enhancing the brokerage support available to SMEs in “border areas” and to produce a wider range of specialist services on offer.
8. Establishing a northern strategic futures task force to map and measure strategic futures for the economic, technological, social and cultural development of the North, and which mobilises HEI expertise relevant to specific initiatives (*e.g.* in Transport).
9. HEIs and RDAs jointly review the role of higher education in cluster development in the North with a view to sharing good practice and identifying opportunities for more specialised cross regional knowledge transfer mechanisms in key areas (*e.g.* chemicals, ICTs, tourism etc.).
10. A follow on to the Cambridge MIT initiative run by a consortium of northern HEIs focusing on sharing best practice in supporting graduate enterprise. This should be linked to active programmes for retaining graduates in the North and recruiting alumni to return to the North.
11. A task force of HEIs and city and regional marketing experts is convened to explore the possibility of pooling expertise and resources in marketing higher education centres across the North.
12. The partial integration of northern HE placement schemes.
13. HEIs in the North seek support from national and regional stakeholders to undertake a baseline study of pathways through FE into HE and the labour market with a view to long term monitoring to identify key gaps in provision and barriers to progression.
14. HEIs to jointly consider HE “cold spot areas” (including subject cold spots) across the North and mechanisms to address these.

15. To increase co-operation between teacher training institutions across the three regions with the objective of:
  - Increasing the number of teachers trained and retained in the North.
  - Enhancing teacher supply in areas of social deprivation.
  - Maximising the impact on new subject development into classroom practice (building on initiatives such as the National Science Learning Centre).
16. The northern RHEAs should review the consequences of the potential loss of structural funds and measures that might be introduced in mitigation with appropriate regional stakeholders.
17. Maximise northern interaction with European non structural agendas, in particular the Regions of Knowledge Initiative, to produce a cluster of regions in the North at the leading edge of development in relation to:
  - The development of regional research capability.
  - Use of framework funds.
  - Mobility funds.
18. The Northern Higher Education Associations should come forward with a costed proposal to take forward investigations into endorsed proposals for the HE contribution to the Northern Way.

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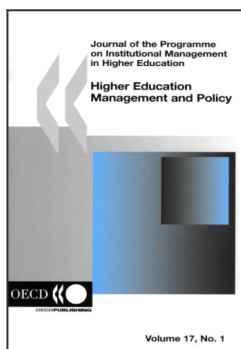
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