UNIVERSITIES AND REGIONAL DEVELOPMENT

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1 Introduction

An interest in the potential contribution of universities to regional development has corresponded with a wider shift in economic geography towards modes of discourse and analysis in which knowledge and innovation are core concepts. The new knowledge produced through advanced scientific research in universities is a potentially vital input to innovation in technology-based industries that are seen by many academics and policymakers alike as key to regional competitiveness in the post-industrial economy. Numerous studies have emphasised that local knowledge spillovers from strong research universities were central to the formation of world-leading industrial clusters in sectors such as information technology and biotechnology. Conceptually, the recent prominence of institutional frameworks in economic geography, such as learning regions and national or regional innovation

systems, has created a space for universities to be included in analyses, as part of the non-firm institutional structure of a territory that supports economic development.

This chapter will reflect on this dominant viewpoint of the role universities play in regional development across three further sections. First, a brief background identifies the major contextual factors that enable and constrain the relationship between universities and their regions. Second, the main body of the review focuses on the contribution of universities to innovation and technology-based development in their regional economies. Third, we argue that a broader interpretation of universities in regional development should be taken, beyond simply their role within the "knowledge economy".

2 Background: higher education and regional development drivers

Previous international studies comparing the involvement of universities in the development of different regions have demonstrated that this varies significantly depending on a number of national and regional features. A large-scale OECD (2007) review, encompassing 14 countries in 5 continents, found that the conjoint development trajectories of universities and regions are shaped by a combination of factors, including the historically-formed industrial characteristics of the region, the extent to which higher education is incorporated into regional development policies, and the institutional make-up of the national higher education system. From the findings of another study, of 14 regions in 7 European countries, Boucher *et al.* (2003) emphasise that the level of competition between higher education institutions within a region is another crucial factor, with the highest overall levels of engagement from individual institutions tending to be exhibited when there is a single large

university in a “peripheral” economic region. In past work we have analysed the interplay of these factors in an analytical framework bringing together drivers and constraints on regional engagement from both economic development and higher education policy and governance spheres (see Goddard and Puukka, 2008). The articulation of these two sides can be seen in a series of recent transformations that have taken place, to greater or lesser degrees, in the external environments of universities across a range of countries (OECD, 2007).

On the regional development side, universities are being attributed a changing role in public policy, where they are increasingly positioned as central to the building of ‘knowledge economies’ at regional or urban as well as national scales (Harloe and Perry, 2004; May and Perry, 2006). This can be seen as part of a more general shift in regional policy thinking towards measures that concentrate on building and mobilising the varied institutional capacity of a region to support bottom-up, endogenous development (Amin, 1999). In Europe, despite public expenditure on research as a whole falling significantly during the 1990s, this decrease was concentrated mainly in the funding of large-scale defence programmes and not higher education, meaning that the relative importance of universities within national and sub-national innovation systems have, in fact, generally risen (Larédo and Mustar, 2004). The recognition that academic and other publicly-funded research may have significant economic returns has led to national science policy increasingly overlapping with technology and innovation policies (see Lundvall and Borrás, 2005), and greater interdependencies between universities, industry and government in what Etzkowitz and Leydesdorff (2000) call “triple helix” relations. This has moved science policy into a realm where it also becomes the concern of sub-national economic governance actors, with the effect of introducing a regional dimension to

this in many countries where it has hitherto been controlled overwhelmingly at the national level (Perry and May, 2007). Individual universities are responding to this rescaling in their environments by incorporating an explicit commitment to local and regional engagement into their mission statements alongside core teaching and research activities, entering into strategic partnership relations with key local public and private organisations, and establishing dedicated regional development offices (Charles, 2003).

Changes in the governance of higher education, mainly at the national level, are of equal importance in explaining why universities now interact more extensively with external partners, although in general less attention have been paid to these in the regional development literature. Here, even with trends towards globalisation, such as greater international movements of students and global connectivity of research links between universities (e.g. see Robins and Webster, 2002), national systems of higher education retain their importance and distinctiveness. In comparing higher education policy trajectories in the US, UK, Australia and Canada, Slaughter and Leslie (1997) found that despite some convergence towards more market-orientated systems in the face of reduced public funding bases, the precise content of these policies and the political conditions from which they arose still showed considerable differences between these countries. Marginson (2002) argues that the traditional 'nation building' role of higher education has not become redundant, but that globalisation has forced governments to adapt their national systems to maintain success in a more internationally competitive environment. The provision of research funds by government has also been pushed in a more market-orientated direction, becoming diverted away from basic research in traditional academic disciplines and weighted towards supporting interdisciplinary fields (i.e.

"technoscience") that align with national economic priorities (Slaughter and Leslie, 1997). These more applied forms of research decentre the locus of knowledge production from its traditional home within universities, and direct academics to work in collaboration with a range of other types of private and public institution within society (Gibbons *et al.*, 1994). These developments have coincided with the expansion of higher education sectors in many developed countries to accommodate mass student access, and correspondingly falling levels of public expenditure per student on higher education. This has forced universities to become more "entrepreneurial" in seeking to maximise potential revenue from external sources through, for example, commercialising research or procuring funding from a broader base of government and industry bodies (Clark, 1998; Etzkowitz, 2004).

3 Universities, Knowledge and Regional Development

This main review section will consider the contribution of the regional development literature to understanding the role of universities in local knowledge-based economic development. Reflecting the dominant recent understanding in economic geography more widely, links with industry and government arising from the drivers covered in the previous section have normally been considered strongest in supporting innovation at local scales. In particular, the input that strong research universities can make to the science base of a region has been identified as a key factor in the formation of clusters in certain technology-based industries, of which the paradigmatic modern example is probably biotechnology (Cooke, 2002).

Empirical support for this has been provided by an economics literature on "knowledge spillovers". Studies have generally shown, for certain knowledge-

dependent industries, the existence of local (e.g. US State level) academic spillovers in the form of a positive correlation between university research intensity and corporate innovation level, even after allowing for the effect of internal company R&D (e.g. Jaffe, 1989; Anselin *et al.*, 1997). This statistical analysis is used to explain the geographical concentration of production in these industries on the assumption that firms will locate close to strong research universities to access their knowledge externalities (Audretsch *et al.*, 2005). However, work using this methodology is normally more concerned with finding empirical evidence for the presence of local spillovers than with explaining how or why they occur: knowledge is treated largely as a "public good", without interrogating the challenges involved in translating it from an academic research to applied industrial context, and often without discriminating between the various formal and informal mechanisms through which "spillovers" may occur (Davies, 2008).

Work in economic geography, by contrast, has tended to explore the role of universities in local technology-based growth through case study accounts of certain regions. Of these the leading examples are probably the high-technology districts in Silicon Valley and Cambridge (UK). In Silicon Valley, companies that were formed by alumni of Stanford University's electrical engineering programme, notably Hewlett Packard, are seen as critical to the emergence of the region as a technology centre in the post-war period (Castells and Hall, 1994; Saxenian, 1994; Cohen and Fields, 2000; Leslie, 2000). In Saxenian's (1994) study comparing Silicon Valley with it's main US competitor region, New England's Route 128, relations between universities and firms reflect the wider industrial culture of the regions, hence acting as one of the institutional factors that explains the divergent development trajectories of these regions. In Silicon Valley, higher education institutions were well integrated

into the regional industrial system: Stanford and latterly Berkeley universities adopted open attitudes to collaboration with firms, giving them access to the leading research being carried out there, as well as encouraging their members to be entrepreneurial themselves by establishing firms to commercialise their knowledge. Saxenian (1994, p.42) also cites the role of State and Community Colleges, that like Stanford and Berkley developed close links with local industry to ensure that there was a plentiful supply of graduates with relevant skills to underpin the growth of the region. In Route 128 by contrast, which in MIT and Harvard had comparable local academic assets, the more conservative and large-firm dominated industrial culture meant that relations between these institutions and smaller technology enterprises were more remote. Consequently practices such as promoting technology transfer and academic spin-offs which contributed to the dynamic milieu of Silicon Valley were generally taken up much later.

The socio-cultural elements of university-firm relations have also been emphasised in studies of the Cambridge high-technology cluster in the south of England. Here, in a process similar to that reported in Silicon Valley, many of the firms that comprise the cluster are either direct spin-offs from Cambridge University, or subsequent generations of spin-offs from these original firms (Garnsey and Heffernan, 2005). For Keeble *et al.* (1999) the function of the University is not simply one of producing knowledge for dissemination in the cluster. They argue that processes such as spin-offs, the movement of graduate scientists into the labour market, and the establishment of close links with local firms and research consultancies have also helped to spread conventions for the “positive valuation of research interaction, dissemination, debate and collaborative endeavour” (p.323) within the region. This culture of cooperation between firms, based on norms and

values that are more usually associated with academic rather than industrial practices, are seen by Keeble *et al.* to underpin high-levels of local collective learning.

In both of these cases, however, the universities were probably only a driving force behind the growth of the industrial milieux in their early stages. Castells and Hall (1994, p.20-21) emphasise that subsequent to the crucial contribution of university-based research and development in Silicon Valley, the industrial base of the region developed its own self-sustaining innovative capability and growth dynamics, in which the higher education sector has only a supporting, albeit vital, role in helping to meet local demand for professional labour. More recent research by Saxenian (2006) has highlighted the value of California's world-class universities in attracting talented international students, who subsequently stay in the region to enter Silicon Valley's labour market, and often go on to establish profitable business links with their home countries. Similarly, Garnsey and Heffernan (2005) link patterns of repeated spin-offs from Cambridge University and related firms with the longer-term building of regional industrial competences, primarily contained in specialised labour markets. In the Cambridge biotechnology cluster, Casper and Karamanos's (2003) research shows that firms do have well established links with Cambridge University (in the form of spin-offs, collaborations, graduates entering the local labour market, and employees sitting on advisory boards), but that these are not the exclusive or even dominant source of their scientific relations: these also exist with other universities and firms both inside and outside the region. Other case studies of biotechnology clusters from around the world have indicated that, while embedded universities and the basic research function they perform are central to the science base of most regions, the presence of other factors, such as the availability of

venture capital to directly support enterprise, are at least as important to the success of regional systems (e.g. Feldman and Francis, 2003; Kaiser, 2003; Lawton Smith, 2004). In particular, recent studies that have highlighted the importance of global organisational networks in biotechnology have tended to focus on transnational corporations as the key actors within the industry, capable of establishing operations in multiple regions to access sources of specialist local knowledge (Coenen *et al.*, 2004; Zeller, 2004; Gertler and Levitte, 2005).

The work discussed above suggests that the emergence of successful high-technology districts is contingent upon the convergence of a set of wider regional and extra-regional processes, some of which will be relatively independent of any direct effect universities have in the local economy. Garnsey and Lawton Smith (1998) make reference to complexity studies in explaining why Oxford emerged as a high-technology centre later than Cambridge (UK), despite these areas having many comparable features. Some of the various factors they cite relate to differences between the respective universities and their commercialisation strategies, but others relate to the industrial and geographic structure of the Oxfordshire economy, which was less conducive to the formation of tightly-knit clusters of small firms.

This line of argument is supported by the successful examples discussed above being widely regarded as unplanned developments, largely free of direct government intervention. While this seems to be basically accepted of Cambridge (Castells and Hall, 1994; Garnsey and Heffernan, 2005; Kitson *et al.*, 2009), many contend that the state had a vital part in the growth of Silicon Valley and Route 128 in the form of sustained and concentrated public spending on defence and aerospace during the cold war period, from which universities like Stanford benefitted and strengthened their links with large firms in the local economy

(Saxenian, 1994; Markusen, 1996; Leslie, 2000). Policy-led efforts to replicate these growth dynamics in less-developed regions have commonly focused on reproducing one visible element of the institutional mix found in Cambridge and Silicon Valley – the presence of university-based science parks. These property-led developments (typically involving partnership with local government, development agencies or private finance) provide a space where technology firms can locate together proximate to the university (Quintas *et al*., 1992). Research on science parks has, however, found little evidence for their general effectiveness in terms of granting firms within them any clear advantages, suggesting that physical co-location alone is not a sufficient factor for the formation of profitable relationships between academia and industry (Vedovello, 1997; Löfsten and Lindelöf, 2002; Siegel *et al.*, 2003). For instance a survey of the first wave of such developments throughout the UK by Quintas *et al.* (1992), covering 38 parks with a direct connection to an academic institution built between 1972 and 1988, found that the host universities were just as likely to have research links with firms outside the park as those inside. It also did not find that these initiatives had led to large-scale incidence of academics forming successful companies on the park, leading the authors to conclude that the developmental potential of university spin-off firms had been overstated. In a wider-ranging international study of the "technopole phenomenon", Castells and Hall (1994) show that state-led attempts to establish new centres of technological-based economic growth, whether by means of concentrating national scientific resources, or inducing investment from the private sector, have historically failed to produce the synergies between research institutes and technology firms required for extensive innovation. This is particularly the case when the centre is physically and functionally separated from existing industrial production. By contrast, an example of successful

science-based cluster building around universities, the Finnish strategy reported by Cooke (2002), is attributed to the existence of close relations with both large and small firms: “The key reason for this [strategy seeming to work] is a policy of linkage between university research, R&D laboratories of large companies such as Nokia or AAB, some of their suppliers, and start-up firms spinning out largely from university research”, all of which are “[t]ypically … co-located on or near the technology park” (Cooke, 2002, p.168).

Over roughly the past ten years, many studies of universities in regional development have used a regional innovation systems (RISs) framework. Adapting the earlier national innovation systems approach to current understanding of the working of regional economies, this approach analyses the interrelationships between various organisational components (including firms and supporting governance, financial and knowledge infrastructure like universities) and the cultural or institutional environment that determine the innovative capability of a region (Cooke *et al.*, 1998; Cooke, 2001; Iammarino, 2005). While much of the work on the localisation of university-firm links reviewed above is based, even if implicitly, on the assumption that a direct linear transference of knowledge from academia to industry is possible (Quintas *et al.*, 1992), innovation system approaches by contrast are closely associated with a more complex evolutionary and non-linear conception of innovation, involving interactions and feedbacks between different networked agencies (Cooke *et al.*, 1998; Etzkowitz and Leydesdorff, 2000). This position is more aligned with Gibbons *et al’s*. (1994) vision of “mode 2 knowledge”, which prioritises “knowledge produced in the context of application”, and displaces universities from their privileged location as the primary site of knowledge production

in society by granting equal footing to, for instance, other public research laboratories, the R&D divisions of large corporations, networks of smaller firms, government departments, think-tanks and consultancies.

Nevertheless it is clear that, because of their multifaceted character as educational as well as economic and cultural institutions in society, universities will have a distinct place within RISs compared to these other types of organisation. Charles (2006) identifies three forms of value that universities can add to a RIS: knowledge that is directly commodified through spin-offs or licensing of IP, human capital that upgrades skills and knowledge in the regional labour market, and social capital that builds trust and cooperative norms in local economic governance networks. Moreover, he sees that universities that are well integrated into their RIS, and have developed suitable intermediary mechanisms, can play a further key role by helping to join-up these different circuits of knowledge within wider regional innovation processes. These varying functions are reflected in a distinction Gunasekara (2006) makes between approaches in the literature that emphasise universities having either “generative” or “developmental” roles in an RIS. A generative role, which he cites the “triple helix” framework as exemplifying (Etzkowitz and Leydesdorff, 2000), holds that entrepreneurial universities can, in their relations with industry and government, be a driving force of regional innovation and development through “knowledge capitalisation and other capital formation projects” (p.103). A developmental role, which is identified with literature employing the softer terms of regional engagement (e.g. Chatterton and Goddard, 2000), positions the contribution of universities in the less direct role of helping to build institutional capacity through their organisational partnerships with other regional governance

actors, and the diverse external engagement activities of their employees within the region.

To which of these alternatives the higher education component of a RIS most closely conforms will clearly vary across different regional contexts and should be left as a predominately empirical question. For instance, Coenen (2007) compares the North East of England and Scania in Sweden. In the old industrial region of the North East, the relatively strong higher education sector is positioned as having a major part in affecting a path-breaking change in the economy:

> Being one of the few actors in the region with innovative potential, universities play a leading role in policy measures to induce a structural transformation of the regional industrial structure by offering a springboard for new business start-ups in knowledge-intensive and science-based (analytical) sectors such as biotechnology and nanotechnology. As such, a considerable part of the involvement of universities in strengthening the RIS is built on the model of the entrepreneurial university.
>
> (Coenen, 2007, p.816-817).

For Scania, where by contrast strong indigenous knowledge-based sectors have developed in biotechnology and ICT, Coenen frames the primary challenge facing the RIS as a disconnect between the region's knowledge infrastructure and one of it's key traditional industries – food production. Here, the university is seen to have a key part in integrating local food firms into the RIS: "the university plays the role of an extended R&D laboratory for an ailing industry where innovation support is provided

to existing companies and where policy measures are emphasized to reduce the fragmentation and to increase networking" (p.817).

Other work has, like Coenen for the North East of England, focused on the position of universities at the forefront of innovation strategies in less favoured regions (e.g. Benneworth and Charles, 2005; Benneworth and Hospers, 2007). This represents a more general feature of the RIS approach. Rather than concentrating on explaining the success of "exemplary" cases like Cambridge or Silicon Valley, it compares the innovative capabilities and deficiencies of a range of more "ordinary" regions (Charles, 2006; Coenen, 2007). Despite the higher than normal levels of local engagement often demonstrated by higher education institutions in these regions (Boucher *et al.*, 2003), the absence of other conducive conditions means that their actual transformative potential within the economy is likely to be constrained. According to Cooke (2001) over-dependence on public sector institutions, which he sees as characteristic of most regions within Europe, may represent a weakness within RISs, indicating "market-failure" compared to the more enterprising, private-sector centred systems found in the USA where levels of innovation are generally higher.

A further issue concerning RISs is how they relate to other governance scales: clearly RISs are not self-contained, geographically bounded systems, but are instead partly produced through macro-level processes at the national or trans-national level (Iammarino, 2005). This question is particularly salient when considering how universities are inserted into an RIS, since in most countries higher education remains a national system, rather than being governed at the regional level (Charles, 2006). The knowledge assets that universities add to local economies are also, as some authors have emphasised, constituted through international

research networks and communities of academics (Maskell and Törnqvist, 2003; Benneworth and Hospers, 2007; Coenen, 2007).

These scale issues have started to be addressed in a growing comparative literature on the multi-level governance of science policy in different national contexts. In contrast to innovation policy, which in most countries has a regional and, in the case of the EU (see Potts, 2002; Héraud, 2003; Larédo and Mustar, 2004), a trans-national dimension, science policy is mainly national (Crespy *et al.*, 2007; Perry and May, 2007). In the case of England science and technology policy remains, by and large, a highly centralised system that is orientated towards supporting global "excellence" at the national level, and has little in the way of mechanisms through which science resources can be directed to help meet regional economic development needs (Charles and Benneworth, 2001). This means that, despite the system in theory being spatially neutral, in practice it reinforces a geographical imbalance in the state funding of research for universities and other public facilities towards a core Greater South East region that encompasses London, Cambridge and Oxford. The period since the return of a Labour Government in 1997 has, however, in addition to the devolution of relevant powers to new parliaments or assemblies in Scotland, Wales and Northern Ireland, seen the emergence of some form of regional tier of science policy in England. Perry (2007) traces this development of what she calls a "minimalist system of multi-level governance" – in which local actors with only limited capacity concentrate on supporting or delivering priorities defined at the national level. The main catalyst for this change has been a parallel institutional growth in economic development governance organisations at the regional and trans-regional level, which facilitate the development of relationships between universities and local bodies with an interest in promoting

science-based innovation and economic growth. For instance, all nine of the English regions have now established public-private partnership science and industry councils (Perry, 2007, p.1058). The key actors within this process of constructing a new scale of science policy in England, particularly in less developed regions, have been (centrally-funded) regional development agencies (RDAs), which since their inception in 1999 have led the way in incorporating universities into regional economic strategies aimed at boosting endogenous levels of innovation (also see Goddard and Chatterton, 1999; Kitagawa, 2004).

Broadly similar patterns of limited devolution to "minimalist" systems of multi-level science governance have been described in other traditionally centralised countries such as France and Japan (Crespy *et al.*, 2007; Kitagawa, 2007)**.** However, the relationship between national and sub-national levels is different in countries with a federal government structure, with individual states or provinces more likely to have the institutional scope and resources to pursue their own autonomous science as well as innovation policies (Perry and May, 2007). In the USA for instance, various commentators have written about the widespread tendency for state-level university research policy to move in the more instrumental direction of supporting economic development through technology transfer programmes, although these are often at the expense of other higher education funding and may be vulnerable to budgetary cut-backs (Feller, 2004; Geiger and Sá, 2005). Salazar and Holbrook (2007) characterise the Canadian situation as one in which the federal structure blurs the distinctions between levels of governance, so that STI policy cannot be clearly attributed to either the federal or provincial governments, but instead operates predominately through a series of nationwide network programmes that link these levels.

4 Conclusion: a broader role for universities

A recurrent theme in our review has been that empirical research from different places shows the actual success of universities in stimulating regional growth often does not match the role prescribed it in theory. A critical evaluation of the literature indicates that those celebrated cases in which universities have reportedly played foundational roles in technology-led regional economic growth, such as Silicon Valley or Cambridge (UK), are the evolutionary product of a favourable (or "serendipitous" (Kitson *et al.*, 2009) set of geographically and historically contingent circumstances, that cannot be reproduced in any region solely through policies which focus on engendering links between academia and local industry. This may be particularly true of less developed economic regions where limited demand from private enterprise, and 'absorptive capacity' of local industry in general (Christopherson and Clark, 2007), constrains the overall economic impact that universities can have through business support or technology transfer programmes, despite the prominent position they may be assigned in regional innovation strategies.

Other recent reviews have come to similar conclusions. Some have raised primarily empirical and methodological concerns about the often inconclusive evidence or conflicting findings of studies in this field (Lawton Smith, 2007). A related issue is the problem of obtaining adequate data to measure or otherwise properly evaluate the regional economic impacts of university research and technology transfer activity (Thanki, 1999; Drucker and Goldstein, 2007). Others have focused on problematising underlying conceptual beliefs about the potential for knowledge

produced through global academic research networks to be widely and effectively commercialised outside universities as the basis for specifically local economic development (Huggins *et al.*, 2008; Power and Malmberg, 2008).

What these various commentaries point to is not so much that universities cannot play a significant role in regional development, but that the relatively narrow function assumed of them – as a source of knowledge generation and dissemination within a local economic innovation system – is overstated. A theme of this volume is that more holistic concepts of regional development are needed that do not just focus on economic growth and competitiveness (also Pike *et al.*, 2007). In parallel with this, we suggest that a broader view of higher education institutions and their place in society would also be beneficial in more fully understanding the multidimensional contributions that they make to their localities at a sub-national level. This is sometimes revealed by case studies of how individual universities interact with their region across a broad front (Goddard and Vallance, 2009). Several authors have noted the wider cultural and civic roles that universities have and their relevance to supporting local governance, business or community development (e.g. Chatterton, 2000; Charles, 2003; Gunasekara, 2006; Huggins *et al.*, 2008), but in general these processes have not been examined to the same degree as those relating to the production and dissemination of economically valuable knowledge.

To advance the field beyond this may require a wider engagement with current thinking on the role of universities in civil society. For instance, in light of the increasingly social distributed nature of knowledge production described by Gibbons *et al.* (1994), Delanty (2001) conceives a new role for the university as “the most important site of interconnectivity in what is now a knowledge society” (p.6), “a key institution for the formation of cultural and technological citizenship” and “a site of

public debate, thus reversing the decline of the public sphere" (p.7). While this is a global agenda, facilitated by the diffusion of knowledge made possible by today's communications technology, public discourse is also local. It is rooted in the place-based life experience of individual citizens, including the academy and learners. Moreover, to focus on citizens raises the important urban dimension to higher education and the concept of the 'civic university' which mobilises its teaching and research to help meet the economic, social, cultural and environmental challenges confronting 'its' city (Goddard, 2009).

In a wide-ranging review of "universities and the public good", Calhoun (2006) has suggested that while knowledge may be generated in the public interest, it is not necessarily widely circulated: indeed excellence in the academy is often equated with exclusivity. While real knowledge may "eventually" be for the good of humanity as a whole, benefits "unequally trickle down". The rewards for research are tied up with the production of academic hierarchy and the relative standing of institutions. On the other hand, Calhoun (2006, p.19) argues that "public support for universities is based largely on the effort to educate citizens in general, to share knowledge, to distribute it as widely as possible, and to produce it in accord with publically articulated purposes … [including] economic development, especially insofar as this requires technical expertise and general education of participants".

One effect of bringing these kinds of debate into the study of universities and regional development is that it may help the local engagement missions of a more varied set of higher education institutions than just leading-edge research universities to be considered. For Power and Malmberg (2008) a weakness of existing work is that it conflates an institution's global "excellence" in academic research with its "excellence" in being able to support regional competitiveness.

While regions do need access to global knowledge that comes with a strong research base, it is often non-research-intensive universities that have the deepest local or regional links. For instance, Glasson (2003) shows that two newer, teaching-orientated universities in England (Sunderland in the North East and Oxford Brookes in the South East) are highly regionally-engaged, reflecting their histories as local polytechnic colleges, and bringing a range of direct and indirect benefits to their cities. On an international level, there are many countries where higher education does not necessarily resemble the Anglo-American research model that dominates global university ranking tables (Marginson, 2002). Ramachandran and Scott (2009) provide a rare example addressing these issues in a Global South context in their study of how university centres in the mainly rural North Central Coast Region of Vietnam fill important institutional gaps in local civil society by assuming a role similar to development NGOs, with the notable difference that these centres are more likely to be permanent fixtures in the region.

Recognition of the diversity of higher education institutions that co-exist within a region or territory raises the further question of whether future research should remain focused predominately on case studies of single regions and universities, or whether tensions between the academic research and public service missions of universities should also be examined more often in the context of national funding systems and the uneven economic development of the territory. While many countries recognise the importance of supporting a diverse set of higher education institutions to meet national needs, matching this diversity to the developmental needs of different and especially lagging regions has not been a priority for the public funding of higher education in most countries. In England, for instance, the current system is one in which the sole criteria for research funding is to support academic

excellence wherever it is located, and the funding of teaching is linked to graduate output to meet national needs, while funding for regional engagement is largely marginalised in so-called 'third stream' funding. Policy-concerned work in this field could make the case for public funding including a core dimension that recognises the contribution of a university to civil society in the place where it is located, and support the evolution of networks of universities matched to the needs and opportunities of each part of a country (Goddard, 2009).

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