University research and regional development

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University research contributes to regional development through the way it becomes incorporated into different kinds of ‘products’ that make technological knowledge more accessible for local innovating companies. However, universities do not exclusively contribute through their research; their expenditure effects can be important, and teaching activities building regional human capital can also contribute to region’s territorial innovation capacity.

University research contributes in many different ways to regional development, not only through formal commercialisation activities and supporting human capital development, but also through informal engagement & strategic leadership activities. Universities’ main role is as a connection point to global knowledge resources in ways that make that knowledge more easily available to local partners. This means that universities’ regional development contributions are strongly shaped by the regional absorption capacity for the knowledge they import: in less favoured regions their contribution needs infrastructure to help less-innovative firms absorb new knowledge. Moreover, regional development is never a core mission for universities in comparison to teaching and research: stimulating a regional mission involves creating opportunities for mutually beneficial interaction between universities and regional partners.

Background

Academic interest in how university contributions to their regions can trace their pedigree to a dispute between academics in St. Andrews over whether the Golf Club or the University was more significant to the region (Benneworth & Kitagawa, 2017). Since the 1970s, there has been a growing research focus understanding on how universities contribute to stimulating regional development (Harrison & Turok, 2016).
This was driven by a recognition that innovative economic activities were essential to local economic success (Saxenian, 1994) and universities were playing an important role in building these world leading clusters, even where, as with Johns Hopkins University, university leaders explicitly forbade commercialisation activities (Feldman & Desrochers, 2002). Goldstein & Drucker (2016) note some debate remains regarding how significant university research is as a significant driver of regional development, and that local structural and contextual conditions are more influential for shaping regional development but also potential university contributions.

There is the question of what universities contribute. Yigitcanlar (2010) argues that universities are central to the model of knowledge based urban and regional development: in this model university knowledge spills out into the wider society, contributing preferentially to local innovation activities via externalities and agglomeration. Indeed Mowery & Ziedonis (2014) highlight clear demonstrable localisation effects in knowledge transfer via patents in leading US universities.

But at the same time, the contributions university make are extremely diverse: Lendel (2017) shows that universities exchange knowledge via what she calls “products” rather than directly through their teaching and research activities, making it hard to differentiate the impacts of research on regional development from those of other activities. This brief follows Lendel to explore the way that university research-influenced ‘products’ affect regional development.

**Evidence**

Lendel (2017, p. 212) has suggested that “higher education is a multiproduct industry with seven distinct products: (1) education, (2) contract research, (3) cultural products, (4) trained labor, (5) technology diffusion, (6) new knowledge creation, and (7) new products and industries”. Here we focus solely on university contributions that are related to research, and particularly to knowledge spill-over contributions. There are many different ways to segment university research contributions to regional development, including:

- Between formal interactions based on commercialisation via contracts versus informal interactions via engagement (Olmos Peñuela et al., 2013; Perkmann et al., 2013)
- Between impacts via knowledge transfer versus human capital (Eunivation, 2017), and
- Between impact estimations using qualitative versus quantitative approaches (Kitagawa & Benneworth, 2017)

These segmentations cluster around two main kinds of analysis,

- **qualitative** approaches analysing university-centred innovation networks’ systemic properties, and
- **quantitative** (often econometric) approaches analysing commercialisation transactions.
Qualitative evidence

Multidimensionality

There is no one single way in which universities contribute to regional development, and even a single university may be active in many qualitatively different areas (Eunivation, 2017; Benneworth et al., 2016).

Connectivity

Universities provide connections to external knowledge partners, these connections assist local firms to more easily access remote knowledge resources, the “global pipelines, local buzz” model of regional development (Bathelt et al., 2004). Universities can help to build cross-border innovation spaces which help build critical mass and drive regional development in peripheral border regions (Van den Broek et al., 2019). Pugh (2016) highlights how universities help to import and embed new regional development policy approaches and persuade recalcitrant policy-makers of their value.

Upgrading

Universities may provide knowledge services to industry (generative effects), improve local capacities for knowledge exploitation (developmental impacts), and increase local knowledge absorption capacities (Gunasekara, 2006; Uyarra, 2007). Universities can contribute by participating in collective regional activities that help plug gaps in regional knowledge and developing collective action plans for innovation-led growth (Asheim et al., 2010; McCann & Orteges-Argiles, 2013; Benneworth, 2017).

Quantitative evidence

The general effects:

Anselin et al. (1997) provided the first demonstration of local spill-over effects with US universities contributing to local innovation activity. Valero & Van Reenen (2019) confirmed this to be generally true globally, and specifically as a result of knowledge spill-overs through knowledge exchange and student effects rather than expenditure effects. Guerrero et al. (2015) likewise find that “for the majority of the United Kingdom’s universities, research activities have contributed the most to economic growth.” (p. 756).

Borrowed size:

There is evidence to confirm that universities benefit places that lack critical mass and returns to scale of their knowledge activities. Goldstein & Drucker (2006) provided evidence from the US evidence that universities raise local graduate earnings by increasing economic opportunities and innovation; they speculated that this improved regional labour market quality where there were no large cities. Bonander et al. (2016) found that Swedish university college mergers did not of itself increase regional benefits.

Different roles for universities in different places

Lehmen & Menter (2017) note that universities and regions to co-evolve together, with universities reflecting their regions and regions affecting their higher education sector. Huggins & Prokop (2017) find that universities occupy critical positions within networks.
of knowledge exchange that facilitate business innovation: the regional development effects of these networks increases as the innovativeness of the region increases. Qiu et al. (2017) demonstrated that in China, building global pipelines only made sense for universities in more innovative regions; in less successful regions, promoting regional development was associated with universities partnering with local companies. Likewise, more generally, Morozau et al. (2017) revealed that university research contributions are only important for regional development in industrialised and knowledge-based economies, whilst human capital contributions are important for all kinds of region, including low production cost economies.

Overview and gaps

University research contributes to regional development through a wide range of mechanisms not all of which are immediately reducible to economic transactions; shadow prices do not adequately cover collective and public goods (McMahon, 2009). Fairly representing these contributions requires bringing these very different mechanisms together in a comparable way, and this is a non-trivial task; failing to do this produces misleading analyses of what it is that matters and can be harmful for higher education policy-making and practice (Benneworth et al., 2016).

There are four main areas that require better understanding in order to be able to capture the breadth of ways in which university research-based products contribute to regional development:

- Why are universities motivated to undertake regional engagement: although they may have a public goal, universities are not regional development agencies and allowing their research to drive growth is not necessarily institutionally rational (Viquez-Abarca, 2012; Benneworth, 2017a)

- Why are academics motivated to engage with regional partners: regional engagement brings tensions and engagement has a dark side, so what barriers and problems emerge at the micro-scale of interaction (Bozeman 2013; Nieth et al., 2013)?

- How do other kinds of policy & regulation framing university research behaviour affect their regional development consequences (such as prioritising global excellence publishing in English) (Benneworth et al., 2017b)?

- What kinds of conflicts can arise when university research spills-over into regional contexts, and which tensions may involving other partners bring to university governance (Christopherson & Clark, 2010)?

Our focus here has been on university research. Other research traditions consider the effects of university & student expenditures on their regional economies (cf Cooke, 1970; Florax, 1992; Hermannson et al., 2013), the induced economic effects of university technology transfer infrastructure (Hobbs et al., 2018) and the expenditure effects of university research activities (Lane et al., 2018).
Sources


About the author

Paul Benneworth is a Professor of Innovation and Regional Development at the Department of Business Administration and Social Sciences at the Western Norway University of Applied Sciences. Paul's research focuses on the dynamics of innovation and societal change and in particular the ways in which partnerships of researchers, policy-makers and practitioners try to use various kinds of knowledge to stimulate socio-economic development. Paul leads the Working Group on SSH Research Impact in ENRESSH, the COST-funded European Network for Research Evaluation in the Social Sciences and Humanities and is co-leader of the Marie-Curie Slodowska Training Network RUNIN (The Role of Universities in Innovation and Regional Development). He can be contacted at paul.benneworth@hvl.no

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