

The Role of Universities in Innovation and Economic Development: Theory, Measurement and Practice

*The Embedded University in the Science-Economy: Capacities, Contexts and Expectations
Part of the ESRC initiative 'The Impact of HEIs on Regional Economies'*

PREST/CRIC, University of Manchester

Harold Hankins Building, Booth Street West, Oxford Rd. 26th of June

Rationale

This seminar was part of a series of workshops organised as part of the network on the 'Embedded University in the 'Science-Economy': Capacities, Contexts and Expectations'. The network, comprising SURF, IPP/CURDS, and PREST, is one of five networks across the UK commissioned to look at 'The Impact of HEIs on Regional Economies', funded in the first half of 2006 by the ESRC, in conjunction with the SHEFC, HEFCE, HEFCW and the Department for Employment and Learning Northern Ireland.

The network is focused on the role of HEIs on local and regional science-based economic development. The first stage of the network comprised a gap analysis of the current research in relation to universities and economic development, incorporating the views of policy-makers and senior HE managers. This first stage contributed to shaping the second stage workshops.

One of the principal conclusions of the gap analysis was the lack of evidence base in relation to the impact of universities on the local economy. This provided the rationale for the PREST/CRIC workshop on the 'Role of Universities in Innovation and Economic Development'. The workshop focused on *measurement issues*, enquiring whether current indicators and methods are sensitive enough to capture the diversity of universities' economic activities and the scales of this impact (national, regional, city-regional, etc).

The workshop was structured along three themes: 1) Setting the scene: understanding the role of HEIs 2) Policy considerations: understanding the needs and expectations of policy makers and 3) Measurement issues: gaps in existing metrics and indicators. Invited speakers and discussants (policy-makers and academics at national and regional level) provided their own perspective on the key issues and problems for research and for policy practice.

This summary provides an overview of the main issues raised during the workshop, both by the speakers and during general discussion. The slides from all the networks, as well as summaries and final reports, are available online at <http://www.surf.salford.ac.uk/EmbeddedUniversity/index.html>

Workshop Summary

1. Setting the Scene: ‘Impact of HEIs on the Local Economy: Theory, Evidence and Key Challenges’

- There is a longstanding interest in understanding the impact of universities. However, in recent years our awareness of the importance of the university in the economy has increased. On the one side, our awareness of the indirect, underpinning role of basic research in the innovation process has been reinforced by the emergence of dynamic new sectors which are particularly dependent on science-based innovation in fields such as the biomedical sciences. On the other side, we have come to realize that the *direct impacts* of universities as economic entities in their own right can be truly significant.
- Universities are *multidimensional and complex organisations*. They are not only engaged in a range of different activities and responsibilities (teaching, research, and the so-called third mission) but also pursue different agendas and different activities at different spatial scales. There are considerable differences across universities with regard to their mix of activities.
- Some possible *drivers* influencing recent changes in HEIs include: globalisation (e.g. English language teaching and research creating global market); competition and student consumerism (e.g. rise of new agents and functions); demography (pressure for increasing participation, ageing students and teachers), technology (making distance a reduced factor through eg. e-learning but counterbalanced by cost and concentration of facilities) and collaboration with industry (distributed innovation)
- *Policy expectations* of universities have also grown, as evidenced by recent policy measures and initiatives. However, recent policy documents, such as the Lambert review, have tended to adopt a monotypic view, portraying universities as highly flexible, all capable and integrated institutions. They therefore fail to recognise that there is a high degree of heterogeneity amongst HEIs, both in relation to their own strategies and abilities to fulfil their regional national and global profiles and in relation to the diversity of regional profiles they are confronted with. HEIs are very diverse, with different profiles, serving different clients and engaging with very different types of regions. There is therefore a need to better appreciate this heterogeneity.

Shortcomings in metrics and theory

- Although in conceptual terms there has been some acknowledgement of the new roles universities play in economic development, *metrics and indicators* in particular are lagging behind and often do not reflect this heterogeneity. There is a need to better understand the complex and multidimensional nature of universities, via the development of typologies and new metrics.
- At present there is a *limited evidence base* to assess the wider socio-economic impacts of HEIs. Universities are self-evidently big players in terms of spending and in terms of employment, and there are many studies estimating the most direct economic impacts of specific universities. There are also a number of indicators available to describe teaching

and research activities, but less so in other areas such as the third mission and other aspects, such as cultural development, public space, sustainability, etc. There is a need for a much better appreciation of the wide range of activities and impacts of universities. The current set of metrics is not sufficient to deal with the full extent of interactions between HEIs and their environment.

- As well as new and improved indicators we still need better *theoretical frameworks* – indeed the two are inter-dependent. There is, for example, a need to better understand the new ecology of industry, in terms of linkages between large and small firms, patterns of growth, birth, acquisition of firms, collaborative ventures and alliances, changing nature of outsourcing practices, etc. There is also not enough understanding of the changing dynamics of science, as well as how science can be used and how it can contribute to the economy (via e.g. scientific discovery and publication, production of trained people, development of instrumentation and methods, cumulative expertise for problem-solving, access to external knowledge, commercialisation and spin-offs, etc). An important question here concerns the scope for initiatives to build or enhance such effects given the internationalised nature of knowledge production and the inherent uncertainty (serendipity) of the innovation process. Understanding how ‘local’ science relates to global science, and how both relate to uncertain processes of local and global innovation is a key challenge.

2. Policy Considerations

What do policy makers need to know and why?

- There is clearly a strong need for improvement of evaluation and measurement methods. But it is also important to understand the variety of policy needs and policy objectives in relation to measuring the impact of HEIs. Indeed, metrics may be needed for evaluation, self improvement and self-management purposes, for PR purposes, etc. One of the main objectives of measuring impacts is to demonstrate value for money and make a case for increased resources. In this sense, under-evaluation due to poor metrics could lead to under-investment in innovation and research.
- However, the scale, pace and relevance of recent changes in HEIs may not allow a rigorous impact assessment. To the extent that we are talking about a system in transition, thus measurement could be seen as premature. Notwithstanding this difficulty, we still need a strong baseline. We also need to separate metrics and evaluation. Metrics are just building blocks, whereas evaluation provides lessons on how things happen.
- It is also important to consider the relevant *time-scales*, e.g. when is the right time to measure impacts? Policy makers want to know what the timescale of return for their investment is. Changes and impacts take a long time to become visible and HEIs are long-standing and relatively stable institutions with a long history of activity and achievement in their teaching and research missions. In contrast elected governments can have short term expectations and priorities. Policy agendas can be immediate, volatile and even contradictory. Furthermore, different time frames may apply to different activities of universities.

- Often ignored are the *negative impacts* of universities. Generally, all impacts that are mentioned refer to positive effects. However, universities can also have negative economic, social or sustainability impacts e.g. carbon footprint, housing market, etc, which should be accounted for.
- Finally, there are a number of other aspects that are impossible to measure such as the *brand effect*. The ‘hype’ is important in attracting interest to a location. It is therefore about people’s perceptions as much as about more concrete impacts.

Varied (and even conflicting) policy objectives

- Besides enquiring what policy makers need to know, we need to understand the *coexistence of a variety of policy rationales* and objectives at different scales of intervention. The policy word is not black or white, but grey. Policy is not applied in a vacuum, and one of the major elements of the environment in which a policy is applied is the mix of other policies it may interact with. Policy mix is important because a policy can have both intended and unintended effects on other policies. The policy mix is made up of policies made and applied at different levels of governance and with different objectives and rationales, and different time frames. It is often difficult therefore to get consistent policies between different policy actors and across levels of governments. There can also be policy tensions and conflicting interest across policy makers. For example, there is a possible contradiction between regional equity and the promotion of ‘excellence’ at the national level. The culture of autonomy of universities can also make institutional efforts difficult.
- Generally, there tends to be an *unsophisticated view* of the innovation system on the part of policy makers, and a naïve belief that metrics will somehow drive behaviour. Of course meeting the requirements of a performance indicator quickly becomes an end in itself and HEIs are very good at learning to “play the game”, as successive Research Assessment Exercises have proved. There may also be a mismatch between the incentives driven by indicators and the aims and expectations of universities. For example, third mission policy objectives can conflict with traditional academic incentives (driven by a different policy objective).

Local/global engagement of HEIs

- The territorial dimension of universities is not straightforward. *Different geographies* are linked to different roles/activities/ impacts of universities. Universities are also a predominantly urban phenomena and it would be of great interest to study how big cities benefit from their universities and vice-versa. However the urban scale is hard to disentangle, partly due to the lack of adequate indicators. There is also a lack of adequate metrics to map the multiscale spatial dynamics of HEIs impacts.
- The *geography of university engagement* is therefore varied, and there are possible conflicts and tensions between global/regional and local roles. For instance, there are in some cases unrealistic and parochial expectations on the part of local and regional policy-makers that HEIs should ‘serve’ the region first. Of course the roles and aspirations of HEIs as global, national and local actors need not be in conflict, but different institutions

will want to develop different sets of consistent roles, with implications for what they can deliver to their region.

- Some universities may be more favourably engaged or may be able to impact more positively on the local economy. In this sense strong differences across institutions can be found. For example, whereas a small university may have a significant impact on the region (in terms of community engagement, training, HR development in the local economy) a larger, more traditional institution, may be largely disengaged from their local community.
- In terms of research collaboration with businesses, this is not limited by proximity and much of it is national or international. Firms' research engagement with HEIs span regional boundaries, indeed data on university-industry co-publications shows that firms interact with many universities outside the region. Whereas some local linkages may appear relevant, they constitute only a small proportion of the total research collaboration carried out by firms. Indeed, links are often with individual scientists regardless of where they are located.

3. Gaps in Existing Metrics and Indicators

- Despite the changing role of universities, and the heightened pressure placed by policy makers to encourage HEI engagement with the regional and local economies, metrics are not catching up. They fail to keep up with the changing nature and diversity of HEIs engagement, the multiple scales of engagement and the changing policy agendas. There is a need for metrics that say what is actually going on, accompanied by some sort of reference in terms of averages or benchmarks, so as to be able to make useful comparisons and draw relevant conclusions.
- Part of the problem is that indicators are a product of *historical and institutional legacy*, and thus tend to lag behind changes. For instance, economic indicators are a product of post WW2 Keynesian input-output national accounts. Indicators measuring knowledge and innovation, and even more so metrics on culture and creativity, are more recent but still evolving and catching up. Whereas there is a shift in theory and to some extent policy from seeing the performance of an economy as the aggregate of the performance of individual firms towards emphasizing systems and inter-connectedness, indicators remain stuck in the former world. In R&D and innovation policy, indicators and concepts also remain largely rooted in assumptions based on the experience of manufacturing sectors.
- In terms of methodologies to assess the *economic impact of universities*, despite the increasing sophistication of economic multiplier methods, there is a need to revisit these methodologies and models to make them more robust and comparable. Less well established are indicators on third mission activities, which tend to be highly anecdotal and not systematic.

Gaps in research data

- Data need to flow from the natural process of HEIs' research activities and reflect the inputs, activity, outputs and impacts of HEIs. However, there are some problems with these data (as highlighted by the work of Evidence Ltd). In relation to *activities*, indicators on business interaction are particularly weak, despite recent improvements to existing surveys, such as the Higher Education-Business and Community Interaction (HE-BCI) survey.
- Another problem is that linkages, as measured by research *outputs* such as co-publications and patents, are very *sector dependent*. For example, pharmaceutical firms are responsible for the lion's share of publications by industry. These differences across pose substantial difficulties when trying to develop metrics for all activities across all areas. Big firms are also responsible for most of these outputs. In addition, research *metrics* such as patents and citation impacts do not tell us much about the quality and value of these impacts.
- Other problems limiting information flow relate to data collection (institutions would vary in their response intensity, and in their data provision) selection (busy people disappear from the system and their contacts and contracts are not recorded), confidentiality problems and even certain 'measuring fatigue'.
- A key output of HEIs is *human resources*, and this, as much as codified knowledge, is increasingly accepted to be the major contribution of the science base to the economy. However existing data on people and career tracks is not adequate. There is very poor data on intersectoral mobility and mobility and retention in general.
- Other information gaps identified included the lack of statistics on innovative procurement (i.e. procurement of a good or service which does not yet exist, defined by a functional specification with the potential to stimulate innovation), particularly at the regional and local level.

Regional impact indicators

- Finally, there are clear gaps in adequate metrics for *regions and city regions*. Universities' impacts span multiple geographies and yet adequate metrics that can deal with these multiscale spatial dynamics are lacking. The 2004 Allsopp report on regional economic indicators suggested that devolution should be accompanied by adequate regional economic data provision. However, neither the devolution agenda nor now the emerging City Regions agenda have been accompanied by appropriate attention to the design and set up of adequate statistical frameworks. Despite growing academic and policy interest in the role of city regions, they are invisible in indicator terms.

4. Key Issues and Suggestions for Research and Policy

The key issues of the workshop were summed up in the following key points:

- A need to acknowledge the *diversity and heterogeneity* of HEIs. This diversity needs to be reflected in policy objectives (e.g. Lambert Review) and in the development of adequate metrics.
- A need to understand the *emergence of new activities* and roles of universities, both explicit and implicit, tacit, roles. For instance the term ‘third mission’ may conflate a number of distinct and potentially sometime conflicting roles.
- A recognition of the different *time scales* associated with changes and impacts, as well as policy frameworks and objectives, which need to be considered when evaluating and assessing the economic impact of HEIs.
- An unpacking of the *spatial dimension* of HEIs impacts, particularly in relation to spatial definitions and the measurement of impacts at multiple geographical scales, the global-local tensions of university engagement, and the importance of the urban dimension.

The following ways forward were suggested in terms of future research and policy agendas

- Work on multiple and *varied measurement tools*: There are no single metrics able to capture the multidimensional and complex nature of HEIs activities and impacts.
- *Conceptual work*: Theory that can give us a better idea of causal links, cost and benefits of policy decisions, in essence some baseline or framework for analysis
- *Policy analysis*: Some gaps need to be addressed, such as the low involvement of SMEs and the voluntary sector and the low labour mobility of researchers. There is also a need to acknowledge that much of the interaction taking place is tacit, and that both scientific discovery and innovation are inherently uncertain and contingent processes. Finally, there is a need to separate the PR element of impact assessment from honest efforts to assess the economic impacts (both positive and negative) of universities.

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Please see <http://www.surf.salford.ac.uk/EmbeddedUniversity/index.html> for further details on the network.