



Increasing investment in science and innovation is a key part of the Government's plan for growth. To help achieve this, it has invested in 'science and innovation campuses', which are designed to encourage businesses and academics to collaborate.

How can Government and its agencies work out whether the campuses have been successful and how much to invest in them? This Insight argues that standard 'economic impact assessment' techniques are not well suited to this task and instead the approach should be tailored to the nuances of the sector.

Introducing the melting pot

Harwell Oxford and Sci-Tech Daresbury are the two major science and innovation campuses in the UK. According to the Science and Technology Facilities Council, the campuses host over 230 enterprises and 5,000 jobs with the ambition that they will ultimately host 15,000 jobs.

One key feature of a campus is that it typically provides office and laboratory space for businesses to rent in close geographic proximity to academic research facilities. The idea is that the campuses will serve as a something of a 'melting pot', encouraging businesses to exchange ideas with each other and the nearby academic community. As well as being drawn to the melting pot, the campuses are located in enterprise zones, and as such some business tenants are no doubt attracted by 5 years' relief on business rates.

Of course, collaboration does not happen by accident even when would-be collaborators are nearby. An unashamedly unscientific survey of friends and colleagues suggests encouraging collaboration within a single business can present challenges, let alone between them. Indeed, our own more scientific research for the Department for Business, Innovation and Skills (BIS) suggest that collaborations in the area of science and innovation are complex.¹

- » We interviewed 51 academics from 12 leading higher education institutions in the UK. Amongst other things, interviewees felt that successful collaboration was as much about the 'on-the-ground' or 'day-to-day' initiatives by researchers, as it was the 'high-level strategic' initiatives instigated by the institutions they work for.
- » We heard, for example, that the personal relationships researchers forge in the early stages of their career can have a critical effect on their opportunities for collaboration later. These personal relationships are usually started in the corridors of institutions and at conferences.

Maybe campuses should be seen as a 'high-level strategic' initiative designed to encourage a 'day-to-day' initiatives by the business and academic community. In any event, for the investment in the campuses to 'pay back' to the taxpayer, it is clear that they have to address the barriers to collaboration.

¹ Economic Insight (2014), "Growing the best and brightest: the drivers of research excellence".

Lifting the lid

So, how can Government and its agencies work out whether the campuses have been successful? They need to work out whether they have encouraged more collaboration than would have occurred without them – and the economic impact of the extra collaboration. Not an easy task.

We think that a sensible way into the problem is to identify the potential barriers to collaboration and the different ways a campus can help to solve them. The economic literature emphasises the following potential barriers to collaboration:

- » **Potential barrier 1:** There is a lack of awareness / information relating the opportunities to collaborate. For example, a firm may be unaware of the complementary activities that other firms / scientists undertake, or lack sufficient understanding of them.
- » **Potential barrier 2:** There are actual or perceived differences between the objectives of potential collaborators. For example, a scientist may believe that a firm's profit motive may stand in the way of engaging in longer-term / exploratory research.
- » **Potential barrier 3:** There is a lack of common understanding / trust between potential collaborators. For example, a firm may be concerned that rival firms may seek to expropriate good ideas for their own gain, and so mutually beneficial conversations do not arise.
- » **Potential barrier 4:** There is a fragmentation of potential collaborators. It may simply not be obvious where to meet / engage with potential collaborators and the benefits to any individual firm of creating such a 'forum' may not offset its costs - even if it would deliver benefits more widely.

Some of these barriers may be more important than others and so the right first step in the evaluation is to understand which ones matter.

Having identified the potential barriers, one can go on to develop hypotheses for how a campus could help reduce them. For example, it could:

- create a focal point for / density of potential collaborators – increasing awareness / information, and possibly encouraging network effects (i.e. ideas feeding ideas);
- create opportunities for informal collaboration / networking, such as so-called 'corridor' or 'water cooler' conversations;
- create opportunities for formal networking, such as campus based seminars and conferences;
- more generally, the existence of the campus may signal that the UK is a place where collaboration arises and encouraged, which therefore attracts potential collaborators from overseas; and

- provide access to facilities around which collaboration can more readily occur.

It is possible to test hypotheses such as these with primary data collection, via surveys. The success of such survey work rests on ensuring that respondents are encouraged to be critical and comparative. For example, if a campus is thought to have created opportunities for formal networking: what were they and how do they differ from other networking opportunities already available?

Importantly, this 'barrier-hypothesis' starting point is different to a typical standard economic impact assessment, which would start by counting the number of enterprises or jobs at a campus, and in doing so potentially miss the point – as discussed further below.

Counterfactual challenges

A typical economic impact assessment would ultimately involve working out the 'gross value added' (GVA) created by an investment. At a high level, GVA is the profit that businesses supported by public funding earn plus their contribution to the economy through the wages they pay their staff and their capital expenditure.

Such an economic impact assessment does not consider the *counterfactual* i.e. how much GVA would have been created without public funding? Creating a relevant counterfactual is a key part of a full evaluation process. Indeed, one might expect it to be particularly important in the context of campuses.

- » At one end of the spectrum, one could view a campus as a Government funded office building – unless there is a market failure in the supply of offices, the Government may simply be crowding-out private suppliers of office space.
- » At the other end of the spectrum, one could view a campus as being the solution to a fundamental coordination failure – it is not the office space that matters per se – but rather the fact that a campus creates conditions for collaboration that would simply not arise otherwise.

The challenges associated with measuring the factual and counterfactual levels of GVA are exacerbated by the specifics of science and innovation activities, particularly in the early stages of the life of a campus. For example:

- some activities may ultimately be highly commercially successful, but it might take a long time to get there. When in the 'product lifecycle' the evaluation happens is likely to matter; and
- equally, one might reasonably expect a higher business failure rate in relation to science and innovation activities than elsewhere in the economy.

These complications have to be taken account of and addressed.

Points of comparison

Our approach to the challenges above it to use points of comparison and, potentially, implicit valuation techniques. Depending on the data and information available, the points of comparison could be: (i) temporal; (ii) sector-based; (iii) competitor-based; and (iv) geographic.

Temporal comparison

Comparing the performance of a business (in terms of turnover, profit and employment) before and during their time at a campus. It is important to 'control' for: (a) life-cycle effects i.e. that businesses may naturally have grown at faster or slower rates irrespective of being at a campus; and (b) macro-economic factors.

Sector-based comparison

Comparing the performance of businesses at a campus with other businesses in the same sector located elsewhere. An important issue here is ensuring that the comparison is made on a 'like-for-like' basis.

Competitor-based comparison

Comparing the performance of businesses at a campus with others who they consider to be their main rivals. The advantage of this approach is that their rivals may be 'more similar' than other firms in the same sector.

Geographic comparison

Comparing the performance of businesses at a campus with others in the same region. Our view is that this is likely to be the weakest approach given the likely differences between firms on a campus and firms in the region, though it is frequently used.

One example of an implicit valuation technique is to compare the office rental cost of a campus to the rental cost of equivalent office space elsewhere. The logic here is that, to the extent that there is a private benefit of being located on campus, one would expect tenants to be willing to pay for it compared to otherwise equivalent office space. This premium, therefore, is one market-based valuation of the benefit of co-location and collaboration.

In practice, it is often necessary and desirable to use more than one point of comparison.

Conclusion

Increasing investment in science and innovation will continue to be a key part of the Government's plan for growth, and no doubt public funding of campuses will stay on the agenda.

Government has a duty to ensure that public funds are well spent and, with this in mind, the economic evaluation of campuses and other similar investments will continue.

The activities involved in science and innovation are different to the activities typically subject to economic evaluations. The design and implementation of such evaluations should recognise those differences and the challenges they present. This requires a willingness to depart from typical economic impact assessment techniques.

Economic Insight undertakes economic research and evaluation for Government, economic regulators and others, including higher education institutions.

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