Innovation and research policy — university and business perspectives from the UK on what's needed in an age of austerity

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As the reference to austerity in his title would indicate, Bradshaw indicated that the UK was suffering from the worst economic setback in living memory, which is being compounded by massive public debt and a major trading market that is suffering even worse indignities. Perhaps not surprisingly, government has responded by cutting back on its expenditures, including those at the department responsible for business innovation and skills, which has seen its budget cut by 25%. “And this is the department that supports growth,” he said, noting that the cuts have reduced programs such as regional development. Nor is government adopting a laissez-faire attitude toward its remaining expenditures, but instead is looking more closely than ever at those things it is continuing to fund.

Bradshaw zeroed in on research as one way to analyse what is happening. He credited the UK research tax credit with enabling business investment in research. Similarly, initiatives to support design have addressed this key aspect of innovation and commercialization. “Our big issue is the government wants to spread the money too thinly, and that is a danger,” he said, suggesting that it would be better to concentrate on those things that the country does well and matter most. In that respect, he referred to Ted Hewitt’s comments about the growing role of human qualities in making technology successful. “Behaviour, change, and social sciences are becoming increasingly important in what industry’s been asking for, and what they’re engaged with universities for,” he said. “It’s about user experience around technology and new services and products — it’s not just technology that makes the difference.”

He noted that universities naturally lobby for a well supported post-secondary education sector, which can be regarded as a resource that industry demands from any place it wishes to do business. “We are not standing there in the UK as an isolated island,” he said. “We’re competing against the best in the world, and if our system isn’t up to scratch, then the best academics, the best companies will go elsewhere. We have to see investment in the higher education system as an investment, not a cost, and that is a really hard message to get across to government. They see money going out, and what return are they getting?”

By way of response, impact studies try to quantify that return. But Bradshaw also counselled patience, a need evidenced by studies showing that it can take upward of 17 years to see a basic research idea through to commercial success, and much longer in areas such as defence, electronics, and aerospace. The corollary observation is that you can readily cut basic research without seeing much immediate effect on commercial development; only over the longer term will the more devastating impact become obvious, as you run out of ideas for the next generation.

Universities also want autonomy, Bradshaw observed. This makes sense, he adds, since they will be well placed to determine where their resources are best invested.

Infrastructure and research facilities is another area where ongoing investment is essential, he explained. A 2011 innovation survey in the UK showed that about 30% of business spending was on the acquisition of capital. Nevertheless, the country scores very poorly with respect to tax recognition of such investments. When Oxford University studied 33 different tax regimes around the world, comparing features such as corporate taxation and capital gains taxes, the UK scored 31st with respect to the quality of the capital allowance system. Canada, by comparison, scored 19th.

That being said, some individual programs are outstanding. One of these programs targeted the funds sitting idle in corporate coffers, enticing companies to invest it in infrastructure funding at universities. Because universities are required to match government input two-to-one with business input, they usually turn to more than one business partner, which makes each of them feel as if they are getting more bang for their buck. The partnerships run a gamut, with Jaguar-Land Rover supporting a centre of automotive excellence, Rolls Royce investing in a metallurgy group, and Unilever participating in materials chemistry.

Bradshaw outlined a steady decline in the investment government is making in the country's universities. In 2009, capital grants from government made up 49% of the money that went into university infrastructure, with just 12% being funded by the universities themselves. By 2014-15, it will be only 12% of this funding that comes from government, and universities will be putting in 74% of their own money. "What we'd really like is a return to formula-based funding," he said. "That's our autonomy issue. Give the money to universities and let them decide how best to use it to invest in their future." Nor is this a trivial matter, as much of what the universities need to spend money on is rather straightforward campus maintenance and renewal work, while government representatives would rather announce that their support has been put into something new and exciting.

Harkening back to Tom Jenkins' remarks about the virtues of government procurement with respect to innovation, Bradshaw cited his own experience with the Confederation of British Industry, where the highest priority of most members would be obtaining a contract for goods and services. With that in mind, the UK government has ramped up the proportion of its procurement that will be done in concert with the department dedicated to business innovation. Moreover, the country also has a Technology Strategy Board, which Bradshaw compared with the intended form of the National Research Council's transformation. "Businesses like it very much," he said, referring to its tag line of "concept to commercialization". It focuses on technology readiness levels, getting prospective products closer to market; its budget has increased to almost £400 million annually; and it obtains detailed metrics on its R&D investments, so that it can demonstrate how it generated some £9 for every £1 invested in small companies.

As successful as it has been, he would like to see more. "My worry is that if they don't link up with universities, we'll end up just subsidizing what is more derivative or incremental innovation," he said. "What I'd like them to do is be able to tap into that knowledge and research base and bring through some of the basic research that might take 17 years to get to the market, but if we put it through this system we might get it to market in 15 years or 13 years and get that advantage."

Another major issue in the UK is proof of concept funding. In 2010, some 3,000 firms were spun out of research at UK universities. In this context, he identified a "third stream" of support, a program funded with about £160 million a year, which promotes business-university collaborations. "It helps to embed that culture of engaging with industry," he observed, crediting this approach with a doubling of the total investments made in universities since 2001, an amount that is now around £3.3 billion, from businesses, government research organizations, and charities.

"You've got to make some hard decisions around funding what you're good at, rather than trying to do everything." — Tim Bradshaw, Head of Research & Innovation, The Russell Group, UK

In conclusion, Bradshaw argued that businesses need the skills in research and innovation that are to be found on the country's university campuses. Among other challenges, this is where the companies are looking to resolve a shortage of engineers, as well as building up the ability of those companies to take in more graduates, through apprenticeship programs and efforts to make curricula more business-relevant. In graduate schools, even up to the post-doctoral level, business relevance is now being nurtured. Businesses are also seeking more prospective managerial talent, with UK universities regularly comparing their progress with the high professional standards set by the German Mittelstand system.

"The biggest challenge of course for universities is that there's not enough money in the system," he said, pointing out that the UK invests some US$16,000 per student, while Canada invests US$21,000.

Bradshaw agreed with the conference speakers who referred to the innovation ecosystem. “It is an ecosystem,” he said. “It is very complex. It needs nurturing and stroking gently, not pulling up at the roots every few years.” He also reiterated the theme of international competitiveness as a means of determining what areas you will support. Similarly, he called for a critical mass of support, emphasizing the quality of funding to key areas rather than spreading funding as widely as possible. Finally, he revisited his call for patience, and the need to educate people in government about how long it takes to translate basic research into commercial products. “We’re very similar countries in that approach, we have ministers who want to have immediate returns, but it takes time.”

Crelinsten asked Bradshaw if his transition from industry to university was because of a changing perspective in the academic sector on how to interact with businesses. “When they hired me, they talked about how to build up their innovation activities,” Bradshaw recalled. “It wasn’t about how to get more money into the system, but how to build a collaboration with industry.” And he saw the motivation for this new attitude coming from academics themselves, who want to see their work commercialized.

Doug Barber asked how a priority of autonomy for universities can be reconciled with the need to frame a unified national policy. Bradshaw insisted that universities and industry understand their respective customer base better than the government could ever do. “The government has to trust that, and should then monitor what happens and try to shape that future direction,” he replied. “You’ll see if they do because the growth figures will go up. You see if they do because we’ll get more research money being brought into the UK from other countries. You see if they do because our rankings will go up on various scales.”

Moreover, some directed programs can take universities or industry into areas that government would like to make a strength, such as a particular branch of technology. “If you direct a few things, you can move the whole ship in the right direction,” he said. “The challenge is when the government tries to direct the entire ship. It’s going to get it wrong. It’s never been good at picking winners. No government has been.”