

Developing SBRI: Using procurement to spur innovation

Briefing note: June 2017

The industrial strategy green paper, published in January, shows the government is willing to use procurement to ‘drive innovation’.¹ The focus is necessary and welcome. The UK needs to encourage innovation in order to boost productivity and to ensure British business remains globally competitive. Public procurement can play a part in this as it can create demand for innovations that can be used by both the public and private sectors. Government procurement can also be successful in creating interest in projects and leveraging greater private sector investment.

A key area in which governments can use procurement to drive innovation is in research and development (R&D). Governments can use R&D procurement as a tool for driving innovation within the public sector and as a means of developing solutions to policy challenges. Currently the UK spends relatively little on R&D compared to other countries. Addressing this persistently low level of R&D expenditure could help to boost innovation in the UK economy and support long-term growth. One tool currently used by government to encourage innovation through procurement is the Small Business Research Initiative (SBRI). While supporting the initiative this paper points out that the SBRI is currently underused by all government departments, with most not meeting their spending targets.

We therefore see a new industrial strategy as an opportunity for the government to reform and enhance the SBRI. Below we explore why policies like the SBRI are effective and set out four proposals that if implemented could enable this initiative to fulfil its potential and help to drive innovation in the UK economy.

Why use procurement to boost R&D and spur innovation?

Innovation is crucial to sustaining growth and ensuring UK businesses remain globally competitive. However, the innovative process is complex and multifaceted, relying on a flow of information and technology amongst people, enterprises and institutions, and so can be stimulated via measures to improve demand, the degree of competition, infrastructure, services that facilitate flows of knowledge and people, and R&D.

Successive governments have introduced measures aimed at generating innovation and encouraging the adoption of innovative products and concepts across the UK market. Supply-side measures, to a greater or lesser extent, have played the dominant role in these strategies. These include the R&D tax credit and the patent box.

Whilst such measures are important, policies that utilise demand to induce innovation or speed up its diffusion are just as crucial. In fact, evidence shows that demand-side factors

¹ Department for Business, Energy and Industrial Strategy, *Building our Industrial Strategy*, January 2017, p. 11.

are more important for improving the innovation process than supply-side measures,² and that rapidly growing demand is the most important incentive for investment in innovation. It's not surprising that policies which improve demand conditions are rated as the most conducive for innovation in firms.³

Stimulating demand can be achieved via a number of policies: private demand can be spurred by tax incentives or subsidies; and public procurement can create demand for new products and services. However, the UK has a weak record of using demand-side measures as part of its innovation policy.

Of the measures listed above, public procurement offers huge potential to create demand that influences the creation, adaption and diffusion of innovations. This is because the public sector is the single largest purchaser in the UK, spending £242 billion on procurement of goods and services in 2013/14. The potential role that government procurement can play has been regularly highlighted over the last two decades, including in the Department of Trade and Industry's 2003 *Innovation Report*, a 2011 House of Lords enquiry into procurement for innovation, and in January's industrial strategy green paper.

Despite this, the UK's procurement process lags behind competitors. The UK ranks 30th in the world for government procurement of advanced technologies,⁴ and surveyed companies have rated the UK as the country where government procurement decisions are least likely to result in technological innovation.⁵ If the government is serious about boosting productivity, then utilising procurement to spur innovation is a must.

One area where public procurement could make a difference is in boosting investment in R&D. This would boost innovation because R&D investment is a necessary part of to develop new products and services.

Currently, the UK has a very poor record in R&D. When we compare gross UK R&D expenditure to that of other major economies, the UK has both a low level of total investment in R&D, and a low R&D intensity - shown in figure 1 by gross domestic expenditure on R&D (GERD) as a percentage of GDP. The UK's R&D intensity has consistently lagged behind our competitors, making the country one of the least research intensive of the major economies. Some have pointed to the UK having a the relatively high share of less R&D intensive services as the reason for this, however, research by the Council for Industry and Higher Education has shown that the UK's underperformance holds true even once the UK's industrial composition is taken into account.⁶

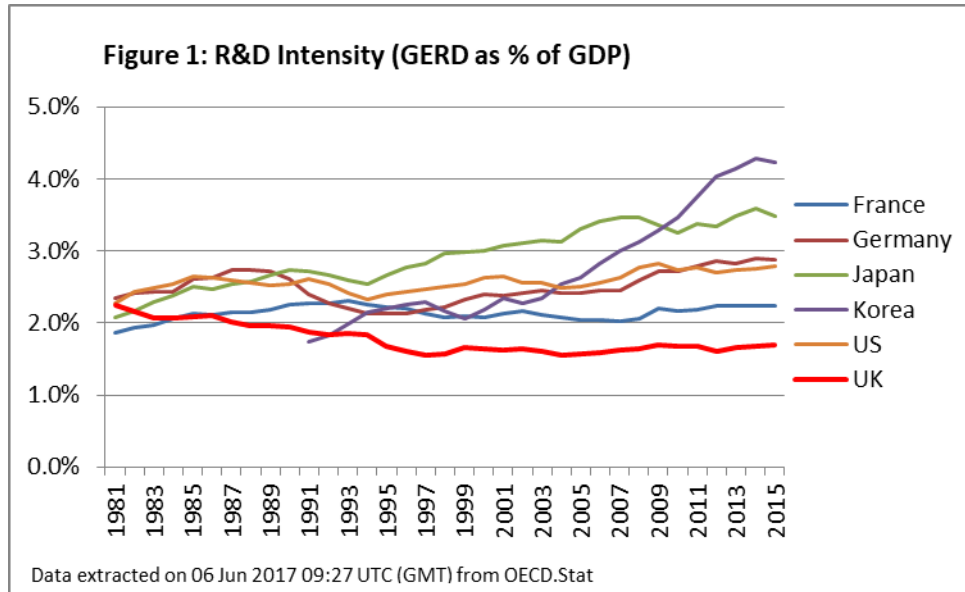
² K. Allman et al., *Measuring Wider Framework Conditions for successful innovation: A systems review of UK and international innovation data*, Nesta, January 2011.

³ European Commission, *Innobarometer 2009: Analytical Report*, May 2009.

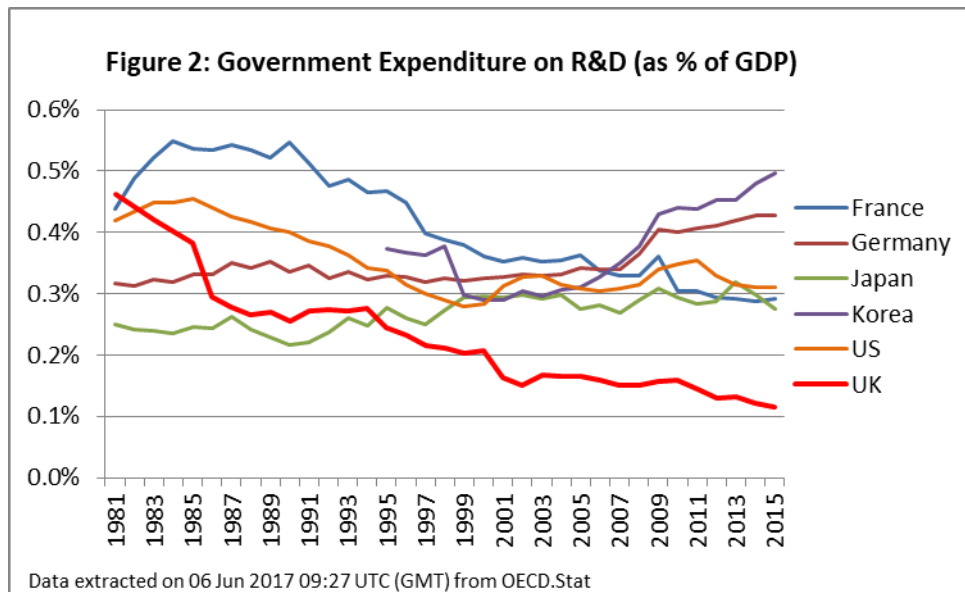
⁴ K. Schwab, *The Global Competitiveness Report 2016-2017*, World Economic Forum, 2016, p. 355.

⁵ K. Allman et al., January 2011.

⁶ A. Hughes and A. Mina, *The UK R&D Landscape*, March 2012, p. 12.



The UK R&D expenditure has remained steady at below 2 per cent of GDP since the early 1990s. However, a stable level of business R&D combined with a rise in higher education R&D, due to increased funding for university research, disguises a continued decline in UK government expenditure on R&D. Figure 2 show that, since the 1980s, the UK has dropped behind a number of countries with government R&D spending reducing from 0.46 per cent of GDP to just 0.12 per cent.



Successive UK governments have tried to stimulate investment in R&D. However, their attempts have predominantly been focused on boosting private investment through supply-side measures, including R&D tax credits and the patent box. The former is expensive, costing the treasury £2.45 billion in 2014/15 and, as figure 1 shows, the above measures have failed to increase R&D as a proportion of GDP. Business expenditure on R&D in the UK dropped from 1.4 per cent of GDP in 1981 to around 1 per cent by the late 1990s. Since the R&D tax credits were introduced in 2000, the level of Business R&D has remained at around 1 per cent, suggesting that although R&D tax credits may have stabilised the level on business R&D they have not been the best way to boost R&D spending. In fact, R&D tax

credits are not used by a number of highly innovative economies, including Germany, Switzerland, Finland and Sweden.

Enhance the Small Business Research Initiative

Evidence, however, shows that sophisticated and novel demand can stimulate R&D.⁷ Therefore, to complement supply-side measures the UK should stimulate demand for R&D via public procurement, which can also be used to leverage private R&D spending and help to create a more stable demand environment for R&D firms.

One of the most important government schemes to attempt this is the Small Business Research Initiative (SBRI). Launched in 2009, the SBRI is a contract-based programme that funds the development of innovative technology solutions to meet government needs. In essence, the scheme procures R&D. It is based on the US Small Business Innovation Research (SBIR) scheme, which has achieved several positive evaluations.⁸

The SBRI has a number of advantages compared to many other, more prominent, R&D incentives offered by the government, including R&D tax credits and grants. Firstly, SBRI contracts cover 100% of the firm's project costs. Under EU state aid rules, grants would not be allowed to do this, but the SBRI programme can fully fund projects since it is a scheme whereby the government procures R&D services. This provides small firms with secure funding for R&D projects, which is especially important in the UK, where many of them struggle to obtain finance to conduct R&D from other sources, such as banks. An SBRI award can also leverage private investment into businesses because it indicates that there is government demand for their products or services.

The SBRI programme has several stages. In the first stage, government departments define an operational or policy problem, identifying the clearest way to communicate their need to businesses. Subsequently, there is an open competition, and the most promising entrants are awarded 100 percent funded R&D contracts to test the feasibility of their solutions (Phase 1 contracts), usually worth between £50,000 and £100,000 and lasting six months. Companies who gain these contracts can subsequently apply for further funding to develop a prototype (Phase 2 contracts). These later contracts are usually capped at £1 million but this depends on the competition. In the final stage, the public sector either enters the resultant technology on the open market and/or procures it itself.

The responsibility for running and funding SBRI competitions lies with the funding department; they have autonomy over how many competitions they run, contracts they offer and money they put into a scheme. Some government departments have seen good results. Over the last four years, NHS England's scheme, SBRI Healthcare, awarded £57 million in funding via 168 R&D contracts to businesses. The scheme has helped to put 20 products on the market, resulted in nine companies exporting their products, and created or safeguarded 420 jobs (their value to the economy is estimated at £33.6 million). In addition, according to independent audits, the innovations inspired by the scheme have an estimated cost saving value of £1 billion for the NHS. This shows that procurement for innovation can nurture cutting-edge products, help companies to export and make public services more efficient.

⁷ J. Elder, 'Review of Policy Measures to Stimulate Private Demand for Innovation. Concepts and Effects', *Nesta Working Paper No. 13/13*, November 2013.

⁸ D. Connell, December 2010, p. 4.

Successive UK governments have seen the value in the SBRI, seeking to increase its funding. In the 2013 Budget, the chancellor aimed to increase the value of SBRI contracts granted by key departments from £40 million in 2012-13 to £100 million in 2013-14 and £200 million in 2014-15. Six departments had specific targets for 2013/14: Defence (£50 million), the NHS (£30 million), Transport (£7 million), the Home Office (£7 million), Energy and Climate Change (£3 million), and Food and Rural Affairs (£3 million). These doubled in 2014/15.

However, the majority of departments have fallen far short of these targets. Whilst the target spend for SBRI was £100 million in 2013/14, the average annual spend since 2009 for all target departments has been approximately £18 million.⁹ Many government departments do not run a constant stream of SBRI competitions. The most impressive, SBRI Healthcare, is one of the few exceptions. But even this scheme fell far short of the NHS SBRI of £60 million target for contracts in 2014/15, disbursing only £20 million.

This lack of success has not been caused by departments' unwillingness or misunderstanding of the SBRI process, but by a lack of resources. Indeed, most departments and agencies have generally not been opposed to running SBRI programmes. Instead, they have stressed the importance of targets that are reasonable and achievable.

To help public bodies to hit the desired targets, there should be a consultation period where departments and agencies are given time to plan their SBRI schemes. Indeed, both government departments and academic evidence have highlighted the need for a consultation period.¹⁰ This is required because many departments do not have a history of technological development. A consultation period would encourage public bodies to develop an understanding of how they could use an SBRI scheme to procure useful innovations. These must be much more specific than the Innovation Procurement Plans drawn up in response to the 2008 white paper *Innovation Nation*.

During this period, public bodies should also be able to propose initial targets that they believe are more reasonable. This is because certain factors, some outside of their control, made it extremely difficult for many departments to hit the incremental targets proposed by the previous chancellor, Mr Osborne. Whilst new short-term targets will help government departments and organisations to transition to budgets with increased SBRI spending, evidence has shown that the aggregate long-term target for SBRI spending should remain at approximately £200 million per annum.¹¹

Once the consultation period is over, there should be an implementation period where departments can put into effect the SBRI strategies that they have developed. The length of such a period may vary, though some studies have recommended that it should last for three years.

During the implementation period, funding will be an important issue. The government's previous expectation that departments increase SBRI spending was not matched by increased funding levels. Subsequently, many departments found it difficult to fund more

⁹ J. Yeow et al., 'The Effect of a Government Target for the Procurement of Innovation: The Case of the UK's Small Business Research Initiative', in K.V. Thai (ed.), *Global Public Procurement Theories and Practices*, Cham, Springer International Publishing AG, 2017, p. 126.

¹⁰ J. Yeow et al., 2017, p. 126.

¹¹ D. Connell, December 2010, p. 14.

SBRI contracts. In addition, shrinking and uncertain departmental budgets, which focused on delivery and value for money rather than innovation, made it even harder for officials to fund SBRI schemes. The government should therefore phase in funding for each year of the implementation period, via a specific SBRI Fund, to support departments in their effort to increase the number of SBRI awards. These funds would be used exclusively for SBRI contracts or resourcing for the SBRI scheme.

There is also a need for mandatory targets further down the line. This is because, according to departments, the lack of incentives to hit SBRI targets makes it difficult for them to prioritise the scheme.¹² The UK can take inspiration from the US SBIR which does have a mandatory target. Federal agencies with extramural R&D budgets over \$100 million (currently, eleven of them) are required to allocate 3.2 percent of their R&D budget to SBIR programmes. Whilst the criteria for deciding which UK government departments should be required to adopt mandatory targets would be a matter for consultation, those that focus on areas that can benefit from increased R&D spending, such as defence, energy, health and transport, should be included. Other studies have shown that Research Councils could run very effective SBRI programmes.¹³

Build a ladder of procurement support

In the US, the SBIR programme is only the first step on the procurement ladder for small firms. More R&D contracts, often much larger, are available via other policies and schemes, such as Broad Agency Announcements, a process through which US government agencies solicit basic and applied research proposal on a subject matter of concern, such as responding to the ebola crisis, and then selects a number of research projects to fund.¹⁴ In addition, some federal agencies offer subsequent non-SBIR funding for R&D or production of products and services that the US government intends to use.

The US SBIR scheme also has a third phase in its programme, offering small businesses the opportunity to commercialise the products they developed using Phase 1 and 2 funding. The SBIR programme does not fund Phase 3. Instead, funding comes from elsewhere in agency budgets or from nongovernmental sources. The Department of Defense (DoD) is a frequent provider of Phase 3 funding, deeming it extremely important because it results in the transition of the technology from an SBIR funded research project to a product that can be purchased and used by the DoD.

The UK SBRI scheme does not offer this level of subsequent support to recipients of SBRI funds, and very few departments provide Phase 3 assistance (SBRI Healthcare being one exception). After a firm has completed Phase 2 funding, the public sector usually either procures the finished product or helps to market it. However, the DoD has benefited massively from Phase 3 programmes. The UK's Ministry of Defence should look into running an SBRI programme with a Phase 3 component. It would most likely help the department to acquire more cutting-edge innovations. Other departments that rely heavily on technology

¹² J. Yeow et al., 2017, p. 126.

¹³ D. Connell, December 2010, p. 14.

¹⁴ USAID, Broad Agency Announcements, <https://www.usaid.gov/partnership-opportunities/respond-solicitation/broad-agency-announcements> (accessed 10th April 2017)

acquisition, including the Department of Health, Department for Transport and the Home Office, should also evaluate the benefits of a Phase 3 component.

An annual evaluation of the SBRI programme

One reason for the SBRI's stunted growth is that its benefits have not been made clear. Thus, there should be an annual evaluation of the Initiative. This should list all SBRI competitions launched across every government department that year, and review the benefits and drawbacks of the scheme, including the number of jobs created, firms supported, products marketed, and companies that have started exporting an innovation.

Such an evaluation would have a number of benefits. Firstly, it would encourage more departments, agencies and officials to back the SBRI, thereby increasing public bodies' participation. It would also help underperforming departments to learn from star performers, allowing them to tweak and improve their SBRI schemes. Lastly, there is a danger that the mandatory target proposed earlier in the paper could lead to departments backing questionable SBRI proposals simply in order to comply with it. An evaluation would scrutinise such SBRI contracts.

Measures that could be included in the industrial strategy

- All current government departments and agencies taking part in SBRI schemes should undergo a new consultation period and subsequent implementation phase.
- A new government-wide SBRI Fund should be introduced. This would grant incremental funding to government departments and agencies running SBRI programmes, helping them gradually to increase spending on the SBRI to meet new targets.
- An annual evaluation of all SBRI schemes should be conducted and collated into a single report.
- Mandatory targets, to be introduced after the consultation period and implementation phase, to ensure participating government bodies continue to invest and meet their SBRI targets.

Conclusion

The Small Business Research Initiative could be a significant tool in helping to drive innovation in the UK economy. Innovation is fostered by investment in research and development, and the SBRI allows the government to create demand for R&D by enabling small businesses to fulfil R&D contracts. This procurement, in turn, will attract investment from the private sector and help to boost overall R&D expenditure in the UK. This should lead to the UK becoming a more innovative economy.

The SBRI is currently underused by government departments and organisations, and must be reformed if it is to fulfil its potential. Here, we make four recommendations which the government could incorporate into changes made as part of a new industrial strategy. These are: new consultation and implementation periods to boost departmental involvement in the

SBRI; a new SBRI Fund to assist with uptake of the Initiative; mandatory targets to make sure SBRI awards continually grow in size; and an annual evaluation of the SBRI programme. These policies will drive innovation in the UK economy and help the government to achieve its goal of improving 'living standards and economic growth by increasing productivity.'



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