



Department for
Business, Energy
& Industrial Strategy

SBRI REVIEW – BEIS EVIDENCE DOCUMENT

Additional and updated findings to the
Manchester/ERC/OMB SBRI Evaluation¹



November 2017

¹ *A Review of the SBRI*, Manchester Institute of Innovation Research with the ERC and OMB Research, 2015, referred to throughout as 'the SBRI evaluation', is published by Innovate UK alongside this Evidence Document.

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Summary

The Small Business Research Initiative (SBRI) was initially introduced in the UK in 2001, based on a long-standing USA Small Business Innovation Research programme, and was remodelled in 2008/09. It has been established as the main Public Procurement for Innovation (PPI) programme in the UK, since its re-launch in 2008/09.

This document sets out evidence and data that BEIS provided to support a review of the UK's SBRI programme, which aimed to improve the impact of SBRI to enhance procurement outcomes for government and support for stimulating innovation among SMEs.

Prior to this Review, Innovate UK commissioned an evaluation of the UK's SBRI programme in 2014, conducted by Manchester Institute of Innovation Research with the ERC and OMB Research. This final evaluation report is being published alongside this Evidence Paper by Innovate UK. The data used in the evaluation covered the period of 2008/09 (when the SBRI was re-launched) to mid-2014. In providing evidence to this Review, we provide an update on the statistics of SBRI usage reported by the Manchester/ERC SBRI Evaluation, up to October 2016, the latest month for which Innovate UK provided management data.

This evidence document comprises three main sections and annexes. We start with describing the usage of SBRI among public sector bodies. Then we look at how SBRI affected firms using a range of data sources. Next, we examine issues in the current SBRI data collection processes and set out an evaluation logic model. Finally we conclude with recommendations on how to improve SBRI data collection and evaluation. Annexes provide a literature review and further details to support these main sections.

Usage of SBRI

This section looks at usage of SBRI among public sector bodies since its re-launch in 2008/09. It then examines the characteristics of winners and applicants of the programme. Descriptive statistics of SBRI usage cover the period of October 2008 to October 2016, the latest month for which Innovate UK provided SBRI management data.

- Use of SBRI increased from £33m in 2009/10 to £81m in 2014/15 (in 2015/16 prices),² although the latest year (2015/16) saw a fall in the total contract value to £61m.²

² The SBRI usage analysis in this document excluded three partially European Commission funded pre-commercial competitions, one unknown type of competition and one third-phase competition with unknown opening month. These accounted for an additional £7m of spending in 2013/14, £2m of spending in 2014/15, and another £2m of spending in 2015/16.

- Targets introduced in 2013 coincided with an increase in the use of SBRI in 2013/14 and 2014/15, but the total usage of SBRI still remained substantially below the targets.
- A total of 325 competitions were launched during the period of October 2008-October 2016 and 2634 contracts worth £352 million were awarded.
 - Of these, 233 are two-phase competitions, an increase of 120 since 2014, when the SBRI evaluation data was collected.
 - More contracts have been awarded for Phase 1 (2117) than for Phase 2 contracts (517).
 - On the other hand, the total value of Phase 2 contracts stood at £198 million, higher than the total Phase 1 contract value at £143 million.
- A small number of public sector bodies dominated the usage of SBRI, and use of the programme varied across departments and agencies
 - Innovate UK (IUK), the Ministry of Defence (MOD), Health (including NHS) and ex-DECC made up 80% of total contract value.
 - Overall, Innovate UK (IUK) has awarded 557 contracts worth the highest total contract value (£76 million) among public sector bodies.
 - Innovate UK has also been the biggest user of Phase 2, having awarded 181 Phase 2 contracts worth £55 million in 2008-2016.
 - The Ministry of Defence has been the biggest user of Phase 1 with the largest total contract value committed (£58 million) for 904 Phase 1 contracts in 2008-2016.
- A high proportion of SBRI contract value has been awarded to small and medium sized firms, those from the South and more established businesses:
 - SBRI has supported SMEs, as per the policy intent – 62% of contract value went to SMEs, compared to SMEs' share of the total turnover in the business population at 47%.
 - The South (47%), the Midlands (24%) and the North (15%) accounted for most of the successful firms' reported locations in line with their regional share of the total turnover of the business population; just 14% were in the Devolved Administrations or from abroad.
 - Nearly half (47%) of contract value went to firms over 10 years old and a third to firms between 1 and 5 years old (33%).

Impact of SBRI on businesses

In this section, we look at how the SBRI programme has affected businesses based on evidence gathered through roundtable discussions, online survey and case studies of SBRI winners. The online survey of around 70 SBRI workshop participants received 43 responses.³

³ A further open online survey was held on Citizen Space. It yielded similar results, and is not included here for reasons of brevity.

- A majority of survey respondents reported positive SBRI impacts on a range of business outcomes, but only a few achieved sales:
 - 67% (29) of these respondents reported developing new or improved products, and 56% (24) reported increased employee numbers.
 - SBRI has helped these firms improve their customer engagement, accelerate route to the market, attract funding and export.
 - However, only 14% (6) of respondents have improved general sales, and 9% (4) achieved any sales to the sponsoring departments.
- In the SBRI evaluation survey of 2011 and 2012 competition winners, a much higher proportion - 42% - reported achieving sales. The new survey covered more recent competitions, for which impacts such as sales may be yet to emerge.
- Around 90% of respondents' projects would have been adversely affected without SBRI, suggesting high additionality of the programme based on these responses
 - 26% (11) reported the project would have started much later;
 - 21% (9) stated the project would not have started;
 - 21% (9) would have completed the project more slowly;
 - A further 16 % (7) of respondents would have proceeded with the projects but in a reduced scale;
 - The remaining 7% (3) reported other adverse impacts without SBRI support, including a reduced level of collaboration; smaller chances of commercialisation and development of technology.

Apart from the above survey findings, SBRI workshop participants described wide impacts of SBRI on their businesses during the workshop, including opportunities of collaboration and networking, identifying new customers, access to large organisations, and publicity/PR gains.

Case studies of five SBRI winners (four micro-firms and one university), sponsored by a number of public sector bodies, describe the journey through SBRI to better understand how participation leads to benefits (or otherwise) and to identify strengths and weaknesses of SBRI from the company perspective. These studies provide anecdotal evidence to back up and complement the business impacts identified from the survey and roundtable discussions:

- Four Phase 2 projects have completed and all have resulted in a new product that has been tested in an operational environment with end-users; one project led to sales to the SBRI sponsoring customer.
- SBRI provided these firms with secure funding to invest in product development and, importantly, the associated recruitment of skilled staff.

Both case studies and roundtable discussions identified similar strengths of SBRI and challenges in using the programme from a business perspective:

Strengths:

- SBRI has an administrative and funding model that is attractive to small businesses: the 100% contract funding, limited bureaucracy, IP ownership and demand-led innovation challenge are positive features.

- Retaining IP was one of the critical advantages of SBRI and companies were able to exploit IP via licensing agreements.

Challenges

- Some businesses had difficulty with ‘what happens next’ after the SBRI process – with no further financial support and direct link to potential customers, many firms, especially SMEs, found it challenging to secure sales after the SBRI project.
- SBRI works well when the challenge is appropriately specified (not over-specified to assume a particular solution nor so vague as to be undirected) and ‘owned’ and managed by a project officer who understands and is committed to the SBRI approach.

Data collection, monitoring and evaluation

In this study, we have used Innovate UK management data to examine the usage of SBRI by public body. This centrally held management data consists of summary information for each competition launched by department and agency:

- Competition type, title
- Brief competition descriptions
- Competition dates – opening month, close month and decision month
- Sponsoring department
- Numbers of applicants for each competition by phase
- Numbers of contracts for each competition by phase
- Total contract value for each competition by phase
- Value of Innovate UK co-funding for each competition

The current data collection processes have been limited by various issues which have imposed barriers to effective monitoring and robust evaluation of SBRI:

- SBRI management data has not been consistently collected in a standardised format by sponsoring public sector bodies.
- Innovate UK only centrally collated summary data at competition level.
- Firm-level data and contract records are patchy, held by individual departments but not shared with Innovate UK.
- Impossible to track individual firms or link with external business databases.

We then recommend a number of measures to improve the current SBRI data collection and management system, including a phased data collection approach:

- Key SBRI data generated by various stages of the process should be collected by sponsoring departments and shared with the central SBRI administration body, as part of contractual obligations.
- Follow-up data should be collected by evaluation surveys or through data linking to external databases.
- A new data management system to

- Collate, store and manage SBRI programme data at both competition and firm level.
- Ensure data security, confidentiality and transparency.

We finally set out an evaluation logic model with a set of key indicators suggested for future evaluation and recommend:

- The central SBRI administrative body and participating departments / agencies should develop and commit to an evaluation plan that employs a range of methods to ensure the robust assessment of SBRI outcomes and impacts.
- The plan should be reviewed by government evaluation experts to ensure it is fit for purpose.

1. Introduction

The Small Business Research Initiative (SBRI) programme has been established as a main programme of Public Procurement of Innovation in the UK, with two main objectives:

- Stimulate innovation in the economy by supporting firms to develop and commercialise new technology-based products and solutions;
- Provide government departments and their agencies with new, cost-effective, technical and scientific solutions.

The SBRI has a phased process:

- Phase I: Concept development / feasibility studies –up to six months;
- Phase II: Prototype development – approximately 2 years.

This should be noted some competitions have not kept to these and used a single phase approach. More details about the feature of the SBRI programme can be found in Annex 1 Literature Review.

This document sets out evidence and data that BEIS provided to support a review of the UK's SBRI programme. This Review was led by an external industrial expert, David Cornell. The Review aimed to improve the impact of SBRI to enhance procurement outcomes for government and support for stimulating innovation among SMEs.

Prior to this Review, Innovate UK commissioned an evaluation of the UK's SBRI programme in 2014, conducted by Manchester Institute of Innovation Research with the ERC and OMB Research. This final evaluation report is published alongside this Evidence Paper by Innovate UK. The data used in the evaluation covered the period of 2008/09 (when the SBRI was re-launched) to mid-2014. In providing evidence to this Review, we provide an update on the statistics of SBRI usage reported by the Manchester/ERC SBRI Evaluation, up to October 2016, the latest month for which Innovate UK provided management data.

The document comprises three main sections and three annexes. We start with describing the usage of SBRI among public sector bodies. Then we look at how SBRI affected firms using a range of data sources, identify issues in SBRI data collection processes and set out an evaluation logit model. Finally, we conclude with recommendations on how to improve data collection and evaluation. Annexes provide a literature review, case studies and further SBRI usage statistics to support these main sections.

2. Usage of SBRI

Key findings:

- Use of SBRI increased from 2010/11 to 2014/15, although the latest year (2015/16) saw a fall in the total contract value.
- Targets set in the 2013 Budget had driven the use of SBRI between 2013/14 to 2014/15, but the total usage of SBRI still remained substantially below the targets.
- A total of 325 competitions were launched during the period of October 2008-October 2016, and 2634 contracts worth £352 million were awarded.
- Innovate UK, the Ministry of Defence, Health (including NHS) and ex-DECC made up 80% of total contract value.
- A high proportion of SBRI contract value has been awarded to small and medium sized firms, those from the South and more established businesses.

Overview

This section outlines the usage of SBRI in the period of 2008 to 2016, providing an update to usage statistics reported by the SBRI Evaluation, which cover the period of 2008 to 2014. The section starts with describing the overall trends in use of SBRI for competitions launched between October 2008 and October 2016, the period from the re-launch of the SBRI to the latest month the Innovate UK data was provided for. Then it outlines detailed departmental uses of the programme by competition type. Finally, the section reviews the characteristics of applicants and winners of SBRI, based on the subsets of Innovate UK management data which include information on firm size, organisation type, region and age for applicants.

Public organisations/competitions covered

This analysis covers over 20 public organisations⁴ which have used SBRI. The data used include all SBRI competitions launched between October 2008 and October 2016, with the exception of the following competitions:

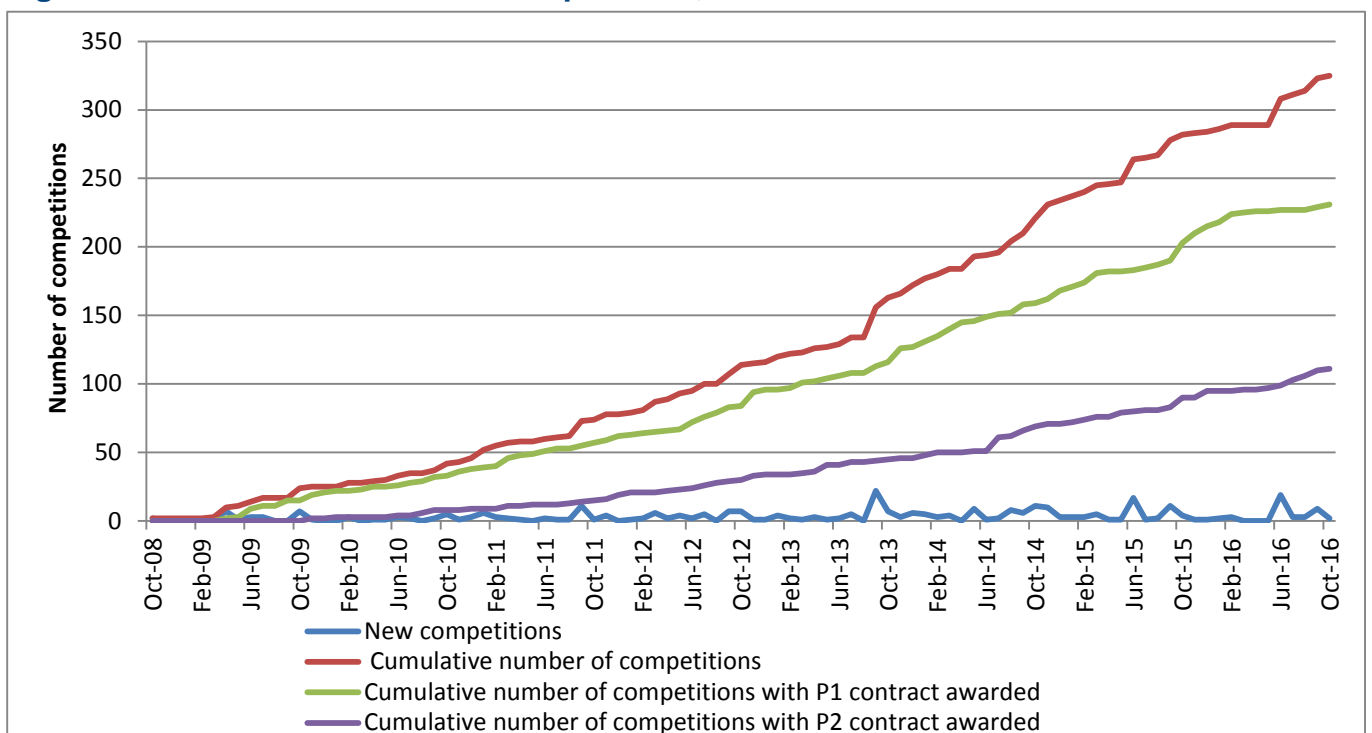
⁴ Six departments which had SBRI spend targets for 2013/14 and 2014/15: ex-Department of Energy and Climate Change (ex-DECC), The Department of Food and Rural Affairs (DEFRA), the Department for Transport (DfT), the Department of Health and the National Health Service (DH and NHS), The Ministry of Defence (MOD), and the Home Office (HO); four major user public bodies which did not have SBRI spend targets: Devolved Administrations (treated as one group), The ex-Department of Business, Innovation and Skills (ex-BIS), The National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs), Innovate UK (NC3Rs and Innovate UK are agencies of ex-BIS); by 'major' we mean the size of usage is significant; and other minor users: Border Force Agency, The Department for Work and Pensions (DWP), Department for Culture Media and Sport (DCMS), Department for Education (DfE), Department for International Development (DfID), Environmental Agency (EA), The Food Standards Agency, (FSA),

- Three partially European Commission funded pre-commercial competitions
- One unknown type of competition
- One third-phase competition with unknown opening month

Overall trends in usage of SBRI

In this subsection, we look at the trends in numbers of competitions, contracts awarded and committed contract value between October 2008-October 2016, and how they varied by phase over time.

Figure 1: Cumulative number of competitions, Oct 2008-Oct 2016



Source: Innovate UK Management Data

Notes:

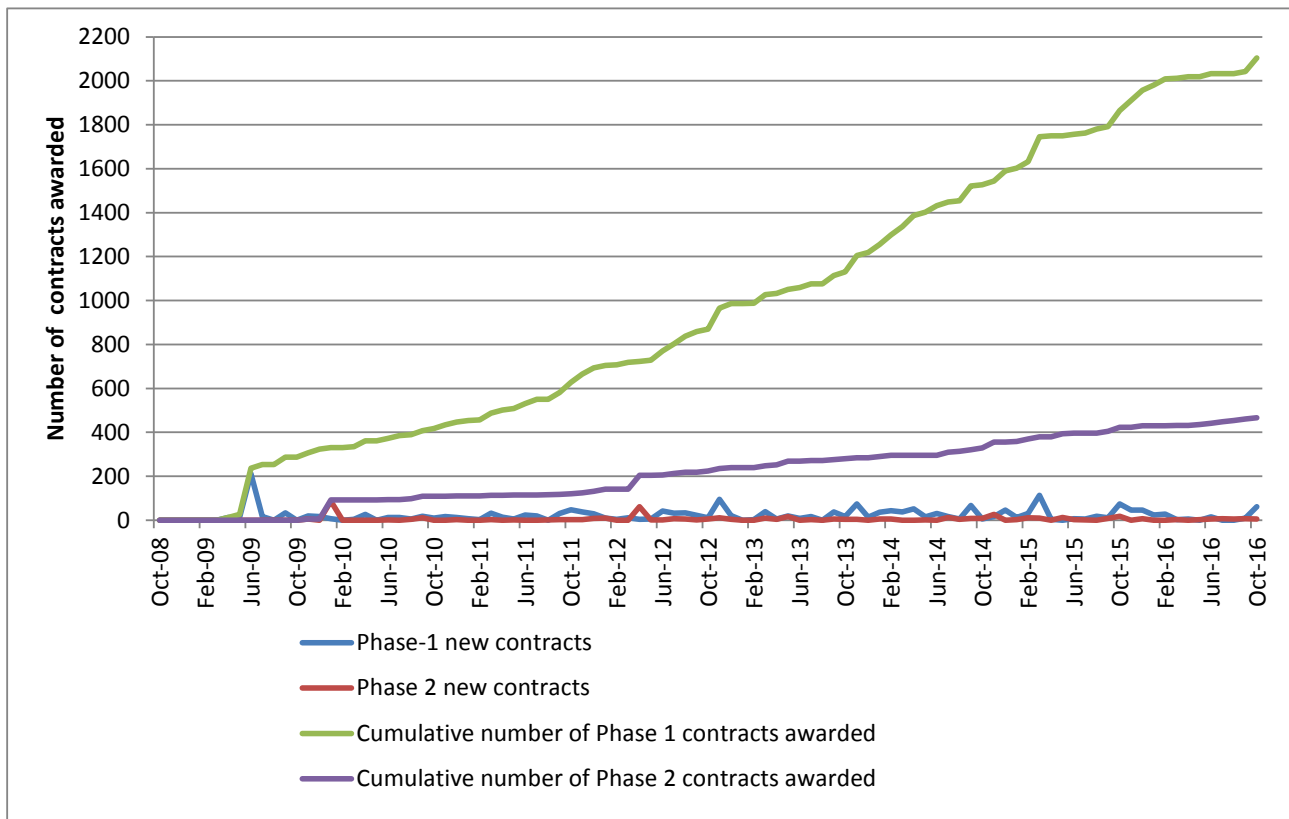
1. The cumulative number of all competitions consists of those launched during October 2008-October 2016.
2. Cumulative numbers of competitions with contracts awarded consist of those having awarded contracts during October 2008-October 2016.
3. New competitions represent the number of competitions launched in each month.

Ordnance Survey (OS), The UK Space Agency (UKSA), Research Councils (RCs), and the Intellectual Property Office (IPO); IPO, RCs, UKSA belong to ex-BIS family.

Figure 1 above shows numbers of new competitions have fluctuated through this period. The number of new competitions peaked at 22 in September 2013, mainly launched by NHS, MOD, and NC3Rs. More recent peaks appeared in June 2015 (17), September 2015 (11), and June 2016 (19). Healthcare sponsors (DH and NHS), MOD, Devolved Administrations and the BIS family (in particular NC3Rs and Innovate UK) have been the main users in launching those new competitions.

While the cumulative number of all competitions has grown steadily to 325 in October 2016, we can see faster growth rates since September 2013. There are widening gaps between the numbers of competitions launched and those having awarded contracts since late 2013, reflecting an increasing lag between competitions' opening dates and when decisions were made.

Figure 2: Number of contracts awarded, Oct 2008-Oct 2016

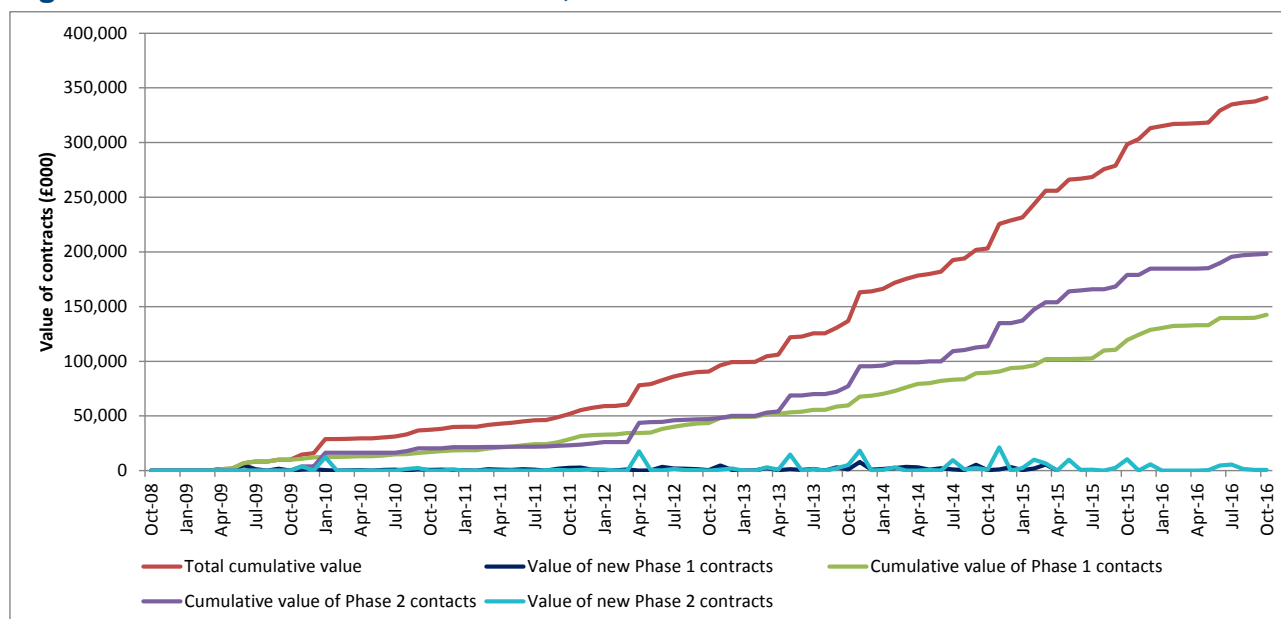


Source: Innovate UK Management Data.

Notes: This chart shows the numbers of contracts that were awarded during the period October 2008 to October 2016.

Next, in Figure 2 above, we turn to see the trends of contracts awarded during the period of October 2008 to October 2016. The cumulative number of Phase 1 contracts amounted to 2104 in October 2016, compared to 466 Phase 2 contracts awarded in the same period, as shown in Figure 2. Since the re-launch of SBRI programme in 2008/09, the increase in the number of Phase 1 contracts has consistently outpaced Phase 2 contracts and the gap in cumulative numbers of contracts awarded between two phases has widened significantly in recent years.

Figure 3: Nominal value of contracts, Oct 2008-Oct 2016



Source: Innovate UK Management Data

Note:

1. This chart illustrates the nominal value for contracts that were awarded during October 2008-October 2016.

Figure 3 above presents the trends in contract value of SBRI committed since 2009. Total value of contacts reached £341 million in nominal terms in October 2016. When breaking down by phase, we can see the value of Phase 2 contracts has remained higher than that for Phase 1, since April 2013, despite more Phase 1 contracts being awarded than Phase 2 contracts, as previously shown in Figure 2. In October 2016, the total cumulative Phase 1 contract value stood at £143 million, considerably lower than Phase 2 contract value at £198 million. However, increases in the contract value for both phases have slowed down since 2016.

Breakdown of SBRI Usage

Next, we look at how departments and agencies used SBRI competitions launched during October 2008 – October 2016. In this sub-section, we consider the competitions by their opening month, and the numbers of contracts and value associated with these competitions are grouped by the relevant competition’s opening month.

Table 1 below shows SBRI usage by department and agency varied a lot with a few departments and agencies dominating the use of SBRI.

Innovate UK has been the biggest user of SBRI in terms of contract value awarded. Since 2008, it has launched 18 competitions, awarded 557 contracts with a total value of £76 million. In addition, Innovate UK has contributed £30 million to SBRI competitions launched by other public organisations and received £2m from other departments towards their programmes. Innovate UK does not expect to co-fund other organisations’ SBRI programmes in the future. MoD has been the most active department with the largest

numbers of competitions (123) and contracts (969), and the second largest amount of contract value (£72 million) committed for these competitions.

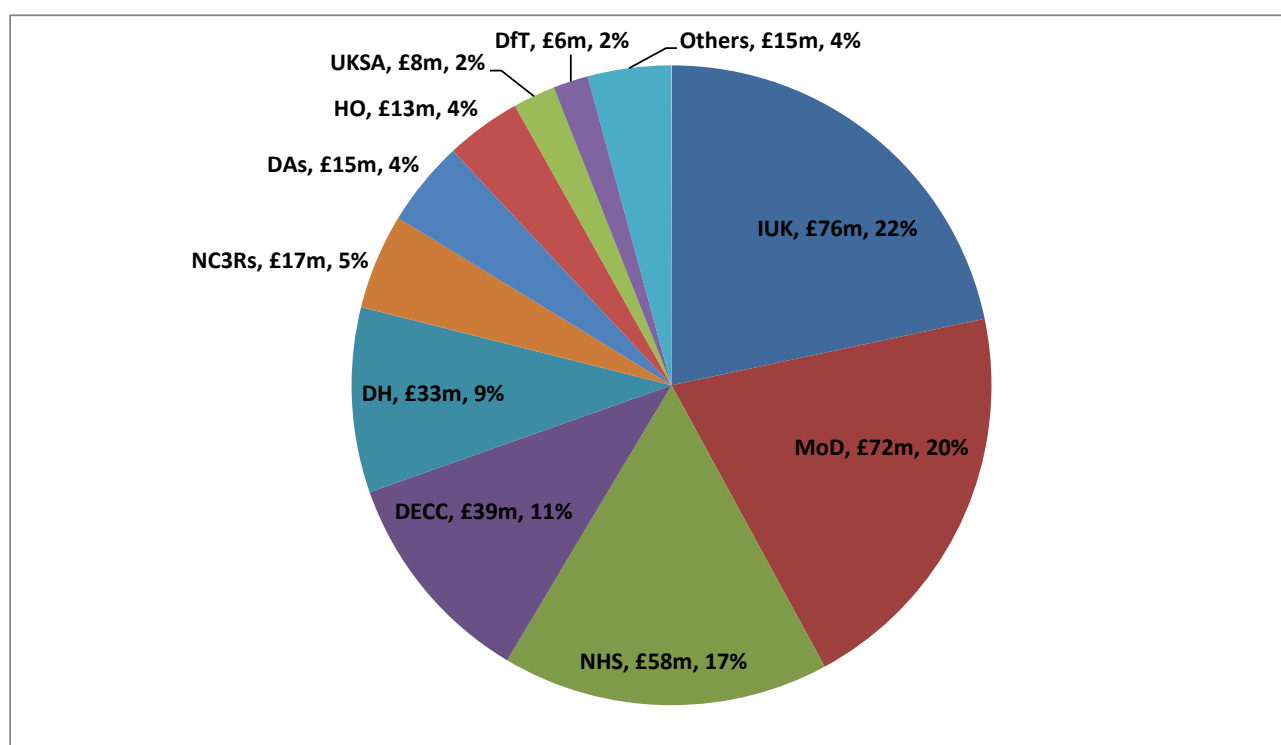
Table 1: Overview of competitions launched by department/agency, Oct 2008-Oct 2016

Department	Number of SBRI competitions	Number of Contracts awarded	Total nominal value of contracts (£k)	Of which Innovate UK co-funding (£k)
Innovate UK	18	557	76,314	N/A
MoD	123	969	71,854	11,721
NHS	44	214	58,155	3,561
DECC	8	147	38,774	946
DH	10	93	32,876	0
NC3Rs	23	57	16,969	4,208
DAs	36	147	15,205	1,748
HO	21	147	13,399	1,268
UKSA	5	21	7,580	1,900
DfT	7	60	6,184	100
BIS	5	55	5,306	2,502
DEFRA	10	65	3,673	743
RCs	2	15	2,466	1,100
FSA	3	17	924	0
DCMS	1	8	726	0
EA	2	10	478	191
Border Force	1	11	400	0
DFID	1	6	288	0
IPO	1	2	200	0
DFE	2	2	196	0
OS	1	6	181	0
DWP	1	25	50	15
Grand Total	325	2634	352,199	30,002

Source: Innovate UK Management Data

Note: This table shows the number of contracts and value associated with these competitions launched during the period October 2008 to October 2016, but note that decision dates for awarding these contracts lagged behind their launch dates.

Figure 4: Share of total SBRI contract value (in nominal terms) by department/agency, 2009-2016



Source: Innovate UK Management Data

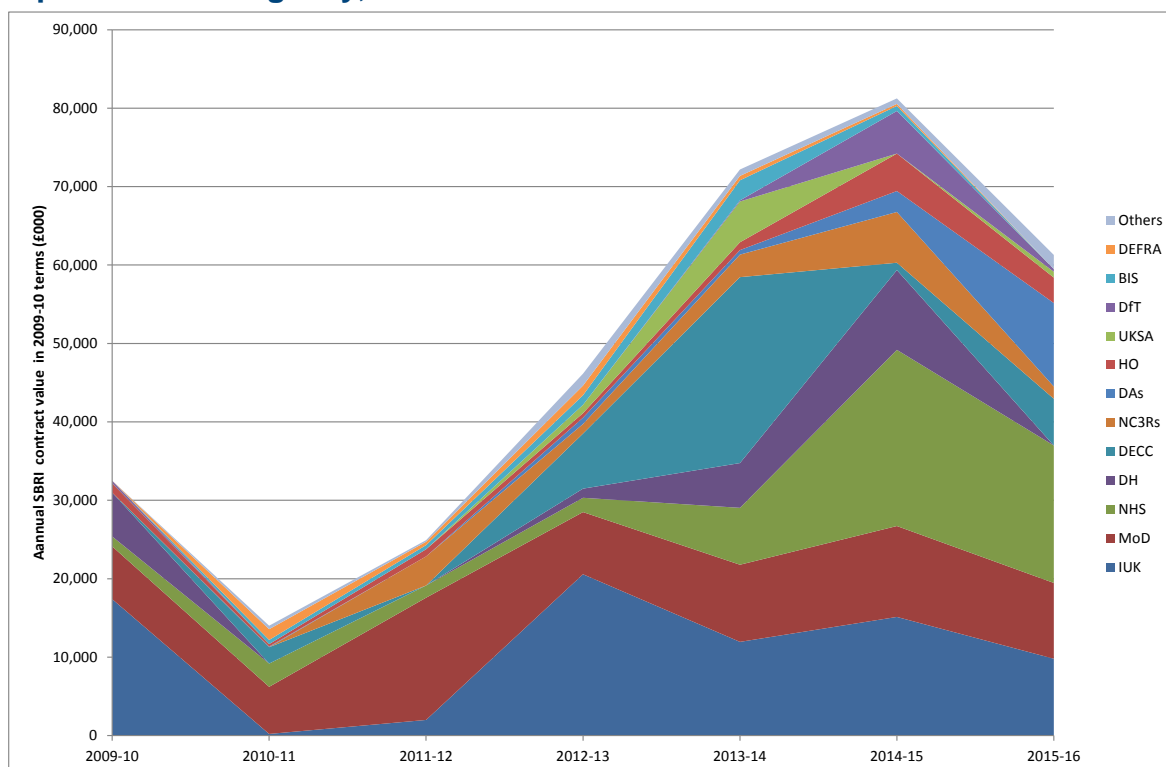
Figure 4 above shows the data from Table 1 on departmental/agency SBRI contract value in a pie chart. As the largest user of SBRI, Innovate UK accounted for 22% of total SBRI contract value since it was re-launched in 2008/09. The five top users (Innovate UK, MOD, NHS and ex-DECC and DH) accounted for 80% of total contract value with the remaining 20% accounted for by 17 other departments and agencies. However, SBRI contract value among these top users only represented a very small share of their procurement budgets- in 2014/15 when the total SBRI contract awards peaked, SBRI contract awards in MOD and DH/NHS accounted for 0.05% of their respective departmental procurement budget, and this share was 0.03% in ex-DECC.

For consistency with the SBRI evaluation, the preceding analysis looked at usage value in nominal terms. Figure 5 below corrects for inflation and shows the total SBRI contract value in 2015/16 real terms increased from £33 million in 2009/10, to peak at £81 million in 2014/15, before falling down to £61 million in 2015/16,⁵ almost double the level seen in

⁵ The SBRI usage analysis in this document excluded three partially European Commission funded pre-commercial competitions, one unknown type of competition and one third-phase competition with unknown opening month. These accounted for an additional £2m of spending in 2015/16.

2009/10. According to the latest data received by Innovate UK, the projected contract awards for 2016/17 are between £70m-£90m. Individual departmental committed SBRI spend fluctuated over time, but Innovate UK, MOD, DH/NHS and DECC have consistently been top users of SBRI.

Figure 5: Area chart for annual committed SBRI contract value (in 2015/16 terms) by department and agency, 2009/10-2015/16



Source: Innovate UK management data; Treasury GDP deflators at market prices

The Government announced in the 2013 Budget that it would substantially expand SBRI among key departments so that the value of contracts through this route increases from £40m in 2012/13 to £100m in 2013-14 and £200m in 2014/15.

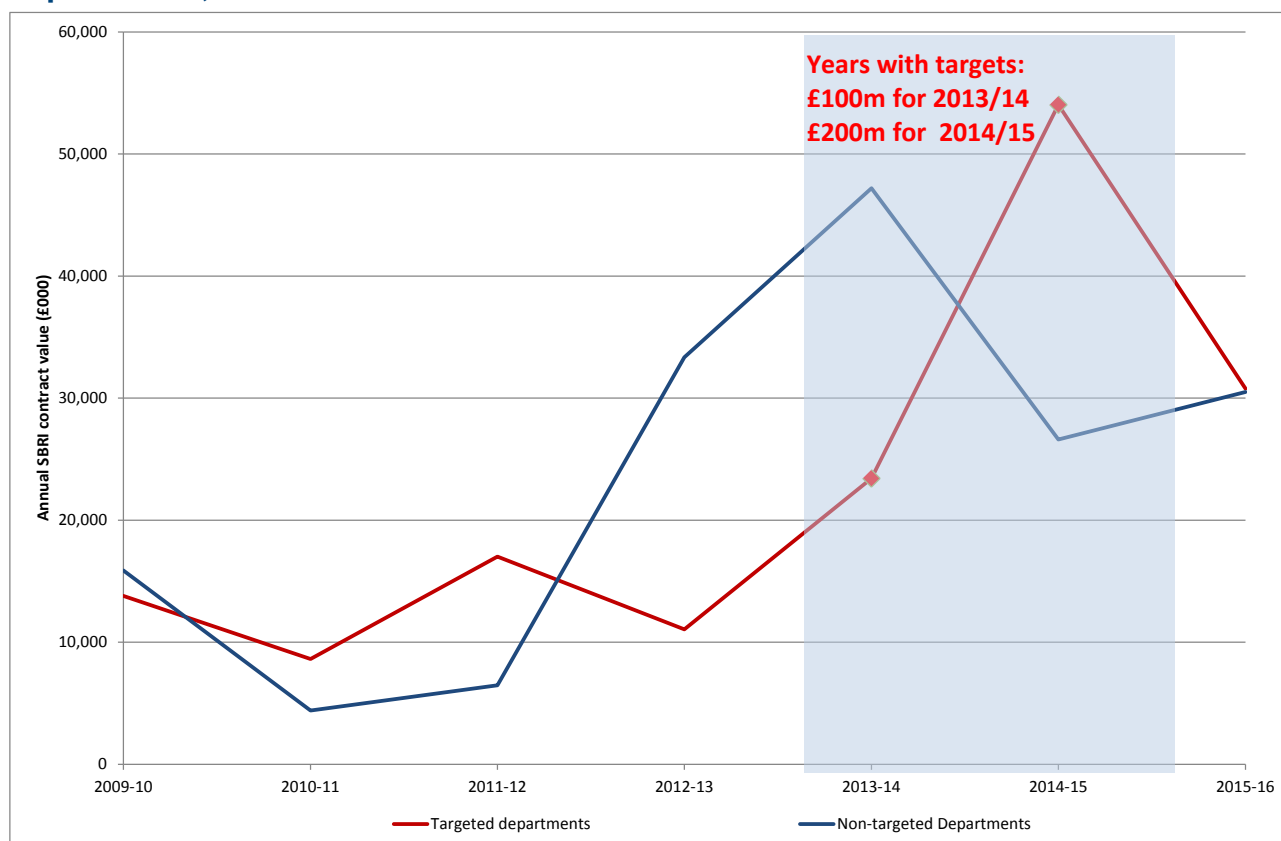
The following departments were given targets (with their 2014/15 target in brackets): the MOD (£100m), the NHS (Health) (£60m), Department for Transport (£14m), The Home Office (£14m), The Department for Energy and Climate Change (£6m) and the Department for Food and Rural Affairs (£6m). These targets are in nominal terms.

However, the SBRI annual committed contract value remained considerably lower than their respective annual targets in 2013/14 and 2014/15 among these departments/agencies, except for DECC, which exceeded the target in 2013/14 but missed the target in 2014/15. Furthermore, annual SBRI contract value represented a very small share of the average gross procurement budget. For example the SBRI contract value as a proportion of the departmental procurement budget⁶ ranged from 0.02% in DEFRA to 0.19% in HO in 2014/15 despite the total departmental committed SBRI spend

⁶ This uses HM Treasury PESA chapter 2 definitions of departmental procurement budgets.

having peaked since the re-launch of the programme. Table A2.5 in Annex 2 outlines detailed annual departmental spend and its share of gross procurement.

Figure 6: Annual committed SBRI contract value by targeted and non-targeted departments, 2009/10-2015/16



Source: Innovate UK management data

Figure 6 above shows targets announced in 2013 coincided with a large increase in the total annual committed SBRI contract value in 2013/14 and 2014/15, for the departments which had targets. Then the total SBRI committed spend for these departments fell sharply in 2015/16, though still remaining above the level seen in 2013/14.

By contrast, the total annual committed SBRI contract value for departments which had not targets had increased since 2010/11, reaching the peak in 2013/14, and then fell sharply in 2014/15 before it increased slightly in 2015/16.

Table 2 below presents a breakdown of competitions by phase and department/agency launched since 2008. Two-phase competitions (233) made up more than two-thirds of all 325 completions, increasing by 120 since 2014, when Manchester/ERC evaluation was conducted. As of October 2016, there were 72 Phase 1 only and 20 Phase 2 only competitions. Each type of competitions has slightly increased by the same amount (5) since 2014 when the data for the Manchester/ERC evaluation was collected,

When looking at individual departmental use of completion types, we can see from Table 2 MOD has been the most active department in launching phase 1 only (54) and two-phase competitions (68). This is followed by NHS, which has awarded 40 two-phase competitions but only 4 Phase-1 only competition in the same period. During the same period, NC3Rs has launched the highest number of phase-2 competitions (8) across departments and

agencies. Departments and agencies generally launched more two-phase competitions than single phase competitions.

Table 2: Number of competitions launched by department/ agency and phase, Oct 2008-Oct 2016

Department	Phase 1 only	Phase 2 only	Two phases	Grand Total
MoD	54	1	68	123
NHS	4	0	40	44
DAs	2	2	32	36
NC3Rs	0	8	15	23
HO	2	1	18	21
Innovate UK	0	2	16	18
DEFRA	4	0	6	10
DH	1	1	8	10
DECC	1	0	7	8
DfT	0	1	6	7
BIS	0	0	5	5
UKSA	0	0	5	5
FSA	2	1	0	3
DFE	0	2	0	2
EA	1	0	1	2
RCs	0	0	2	2
Border Force	0	0	1	1
DCMS	0	0	1	1
DFID	0	0	1	1
DWP	0	0	1	1
IPO	1	0	0	1
OS	0	1	0	1
Grand Total	72	20	233	325

Source: Innovate UK Management Data

Table 3: Phase 1 by department/ agency, Oct 2008-Oct 2016

	Number of competitions that awarded P1 contracts	Number of P1 Applications	Number of P1 Contracts awarded	Nominal value of P1 contracts (£k)	Average value/contract (in £k)	Success rate P1 (%)
MoD	99	4576	904	58,208	64	20%
Innovate UK	16	1453	376	21,107	56	26%
NHS	29	1476	151	13,244	88	10%
DAs	19	626	120	12,518	104	19%
DH	7	316	64	11,723	183	20%
HO	13	662	120	7,485	62	18%
NC3Rs	13	90	41	4,079	99	46%
DECC	8	384	105	3,142	30	27%
DfT	6	282	51	3,138	62	18%
BIS	5	164	41	2,076	51	25%
DEFRA	10	169	54	1,801	33	32%
UKSA	5	55	14	1,760	126	25%
FSA	2	58	10	734	73	17%
RCs	2	26	11	527	48	42%
Border Force	1	35	9	400	44	26%
DFID	1	38	6	288	48	16%
DCMS	1	24	6	276	46	25%
IPO	1	19	2	200	100	11%
EA	2	32	7	173	25	22%
DWP	1	204	25	50	2	12%
Grand Total	241	10689	2117	142,928	68	20%

Source: Innovate UK Management Data

Notes:

1. This table shows the number of contracts and value associated with these competitions launched during the period October 2008 to October 2016, but decision dates for awarding these contracts were later than their launch dates.
2. The analysis excludes competitions that have not awarded Phase 1 contracts.

Table 3 above presents a detailed picture of 241 competitions which awarded 2117 Phase 1 contracts worth of £142 million. These include both phase 1 only and two-phase competitions that awarded Phase 1 contracts. MoD is the biggest user of Phase 1 contracts, awarding 904 contracts worth of £58 million. The next two largest users are Innovate UK and NHS with 376 and 151 contracts awarded respectively.

The average Phase 1 contract value amounted to £68,000. The 64 phase 1 contracts awarded by DH have the highest average value of £183,000. The agency with the next highest average contract value (£126,000) was UKSA with 14 phase 1 contracts awarded.

The average success rate for Phase 1 competitions stood at 20%, but it varied considerably from 10% in NHS to 41% in RCs and 46% in NC3R. The two biggest users, MOD and Innovate UK, recorded success rates of 20% and 26% respectively.

Turning to Phase 2 analysis, Table 4 below shows 128 competitions awarded 517 Phase 2 contracts with a total value of £209 million committed in 2008-2016. These include both Phase 2 only and two-phase competitions which have awarded Phase-2 contracts. As the biggest user of Phase 2 contracts, Innovate UK has awarded 181 contracts worth £55 million in total. The next two largest users of Phase 2 contracts are NHS and DECC with contracts worth of £45 million and £36 million, respectively.

The average Phase 2 contract value stood at £405,000, higher than the average Phase 1 contract value of £68,000. Among Phase 2 contract users, DECC awarded 42 contracts with the highest contract value of £848,000 in contrast with the lowest average value of contracts awarded by FSA at £27,000.

The overall success rate of Phase 2 applicants is 32%, higher than the Phase 1 success rate of 20%. However, the success rate in Phase 2 varied more substantially than in Phase 1 mainly because of a high variation among low-level users of SBRI ranging from 3% in DfE to 78% in FSA. Success rates among big Phase 2 contract users including Innovate UK, Health (NHS/DH) and ex-DECC are between 38% and 55%.

Table 4: Phase 2 information by department/agency, Oct 2008-Oct 2016

	Number of competitions that awarded P2 contracts	Number of P2 contracts awarded	Total number of P2 applications	Nominal value of P2 contracts	Average P2 contract value in £k	Success rate P2 (%)
Innovate UK	13	181	473	55,207	305	38%
NHS	21	63	114	44,911	713	55%
DECC	7	42	93	35,632	848	45%
DH	7	29	59	21,152	729	49%
MoD	23	65	214	13,647	210	30%
NC3Rs	16	16	69	12,890	806	23%
HO	7	27	103	5,914	219	26%
UKSA	4	7	11	5,820	831	64%
BIS	5	14	38	3,230	231	37%
DfT	3	9	39	3,045	338	23%
DAs	9	27	161	2,687	100	17%
RCs	2	4	9	1,939	485	44%
DEFRA	4	11	28	1,872	170	39%
DCMS	1	2	5	450	225	40%
EA	1	3	4	305	102	75%
DFE	2	2	58	196	98	3%
FSA	1	7	9	190	27	78%
OS	1	6	125	181	30	5%
Border Force	1	2	9	0	0	22%
Grand Total	128	517	1621	209,271	405	32%

Source: Innovate UK Management Data

Notes:

1. This table shows the number of contracts and value associated with these competitions launched in the period October 2008 to October 2016, but note that decision dates for awarding these contracts were later than their launch dates
2. This analysis excludes competitions that have not awarded Phase 2 contracts.
3. 'Success rate' = number of contracts awarded/number of applicants
4. '-' denotes data not available

Characteristics of Firms

This section looks at characteristics of SBRI applicants and winners in terms of firm size, region and age. These analyses are based on a subset of Innovate UK management data with recorded characteristics. These are for Phase 1 only. The total number of Phase 1 applications amounted to 10,689 in period of October 2008-October 2016. We estimate 30%-50% of these applications recorded characteristics information.

Table 5: Numbers of applications, contracts and contract value by firm size, 2008 – 2016

	Number of applications	Number of contracts awarded	Value of contracts (£k)	% of applications	% of contracts awarded	% of total contract value (%)	Rate of success (%)	Count of firms in the size band as % of all firms	Turnover of firms in the size band as % of total turnover
Large	877	248	18,404	16%	23%	25%	28%	1%	56%
Medium	492	141	9,568	9%	13%	13%	29%	3%	15%
Small	1387	255	16,719	25%	23%	22%	18%	15%	16%
Micro	2140	299	20,425	39%	28%	27%	14%	82%	13%
Others	630	143	9,840	11%	13%	13%	23%	NA	NA
Subtotal	5526	1086	74,956	100%	100%	100%	20%	NA	NA

Source: Innovate UK Management data; BEIS Business Population Estimates, 2016

Notes:

1. Data are not available for all competitions; 5526 applications with firm size information are included.
2. Size definition according to EU definition - Number of employees: Large ≥ 250 ; 50 \leq Medium < 250 ; 10 \leq Small < 50 ; Micro < 10
3. The total business population excluded those with no employees.
4. Rate of success = number of contracts awarded / number of applications.
5. Others include applicants/winners from academic, public or non-profit organisations.

Table 5 above shows micro, small and medium sized firms (SMEs) accounted for 73% of applicants, and made up 64% of contracts awarded and 62% of total value committed. Although, SMEs made a vast majority of total business (99%), they accounted for less than half of total turnover (44%), lower than the share of SMEs (62%) in total SBRI contract value committed. Large firms accounted for 16% of applications, 25% of contracts and 23% of contract value, lower than their share of total business turnover at 56%.

According to this subset of data with firm size recorded, the success rate varied considerably by firm size. It is the highest at 29% among medium-sized firms, although they only made up 9% of applications and 13% of total contract value awarded. Large firms recorded the second highest rate of 28%. This is followed by others (academic,

public and non-profit making organisations) at 23%. The success rates were lowest among micro (14%) and small firms (18%).

Table 6: Numbers of applications, contracts and contract value by region, 2008-2016

	Number of applications	Number of contracts awarded	Value of contracts	Number of applications (% of the subset)	Number of contracts awarded (% of the subset)	Value of contracts (% of the subset)	Rate of success (%)	Share of total business turnover
South	2560	518	38,569	47%	48%	51%	20%	53
Midlands	1290	237	14,414	24%	22%	19%	18%	23
North	847	168	10,915	15%	15%	15%	20%	15
Scotland	279	63	5,402	5%	6%	7%	23%	6
Wales	191	41	2,291	3%	4%	3%	21%	2
Northern Ireland	164	39	1,750	3%	4%	2%	24%	2
Non-UK	140	22	1,727	3%	2%	2%	16%	NA
Subset total	5471	1088	75,070	100%	100%	100%	20%	100%

Source:

Notes:

1. Data are not available for all competitions; only the subset of 5471 applications with region information included.
2. Rate of success=number of contracts awarded/number of applications.
3. 'Mid' includes East Midlands; East of England; West Midlands.
'South' includes London; South East; South West.
'North' includes North; North West; Yorkshire and The Humber

Geographically, almost half of applicants (47%) are located in the South, winning 48% of contracts and accounting for 51% of contract value, as illustrated in Table 10. This is followed by firms in the Midlands and the North, respectively accounting for 24% and 15% of all applications with location recorded. It is not clear to what extent the location reported for firms reflects where their economic activity takes place. It should be noted that the disproportionately high share of applicants from the South, may reflect the large proportion of companies that have registered in the South. It is worth noting that the South also accounts for a large proportion of the total business turnover in the UK.

Only a minority of applicants came from three devolved administrations (Scotland, Wales and Northern Ireland), accounting for 3%-5% of all the applications with location information. Non-UK applicants filed the lowest number of applications, making up just under 3% of these applications.

Among English regions and Devolved Administrations, success rates varied from 18% in Midlands to 24% in Northern Ireland. Non-UK applicants were the least likely to succeed in applying for SBRI with a success rate of 16%.

Table 7: Numbers of applications, contracts and contract value by business age, 2008 – 2016

	Number of applications	Number of contracts awarded	Value of contracts	Number of applications (% of the subset)	Number of contracts awarded (% of the subset)	Value of contracts (% of the subset)	Rate of success (%)	Age group as % of IDBR
Pre-start-up	149	7	491	4%	1%	1%	5%	NA
Start-up: <1 year	574	56	3389	15%	8%	7%	10%	9%
Established: 1-5 years	996	179	15623	27%	25%	33%	18%	33%
Established: 5-10 years	564	101	5712	15%	14%	12%	18%	18%
Established: 10+ years	1472	375	22716	39%	52%	47%	25%	44%
Total	3755	718	47931	100%	100%	100%	19%	100%

Source: Innovate UK management data and Inter-departmental Business Register

Notes:

1. Data are not available for all competitions; only the subset of 3755 applications with business age information included.
2. Rate of success=number of contracts awarded/number of applications.

Next, we turn to see the age distribution of SBRI applicants and winners based on a subset of the Innovate UK management data with known business age.

As shown in Table 7 above, businesses in the oldest age group (10+ years) accounted for the largest share of all the applications (39%) in this sample in contrast with only 4% of applications which were pre start-ups. The success rate increased with business age ranging from 5% among pre start-ups, to 10% for start-up, to 25% among those established more than 10 years. Consequently, businesses established 10 or more years ago made up 52% of contracts awarded and 47% of total contract value in the sample. Start-ups made up 7% of total contract value in the sample, in line with its share of 9% in the total business population in the Inter-departmental Business Register (IDBR), though the register may not capture many start-ups which fall below the registration threshold of PAYEE and VAT.

This is in line with results from the Manchester/ERC evaluation, although it should be noted that the data source for this analysis is different from that the Manchester/ERC evaluation used to look at the age distribution. The evaluation used the results from a survey it conducted of SBRI applicants, with a total of 572 respondents who provided information on the age of businesses. The Manchester/ERC SBRI evaluation found that while SBRI applicants (winners and non-winners) were generally younger than the population of firms as a whole, the majority of SBRI applicants remain mature rather than

new businesses: the proportion of applicants more than 20 years old, for example was more than twice the proportion of those less than 5 years old.

3. Business Impact of SBRI

Key findings

- A majority of survey respondents reported positive impacts of SBRI on a range of business outcomes, especially in developing new and improved products, but only a few achieved sales.
- A vast majority of respondents' projects would have been adversely affected without SBRI support – either reduced in scale or abandoned.
- SBRI workshop participants reported on wide impacts of SBRI on their businesses, including opportunities of collaboration and networking, identifying new customers, access to large organisations, publicity/PR gains.
- Both case studies and roundtable discussions identified similar strengths of SBRI and challenges in using the programme from a business' perspective:

Strengths:

- SBRI has an administrative and funding model that is attractive to small businesses: The 100% contract funding, limited bureaucracy, IP ownership and demand-led innovation challenge are positive features.
- Retaining IP was one of the critical advantages of SBRI.

Challenges

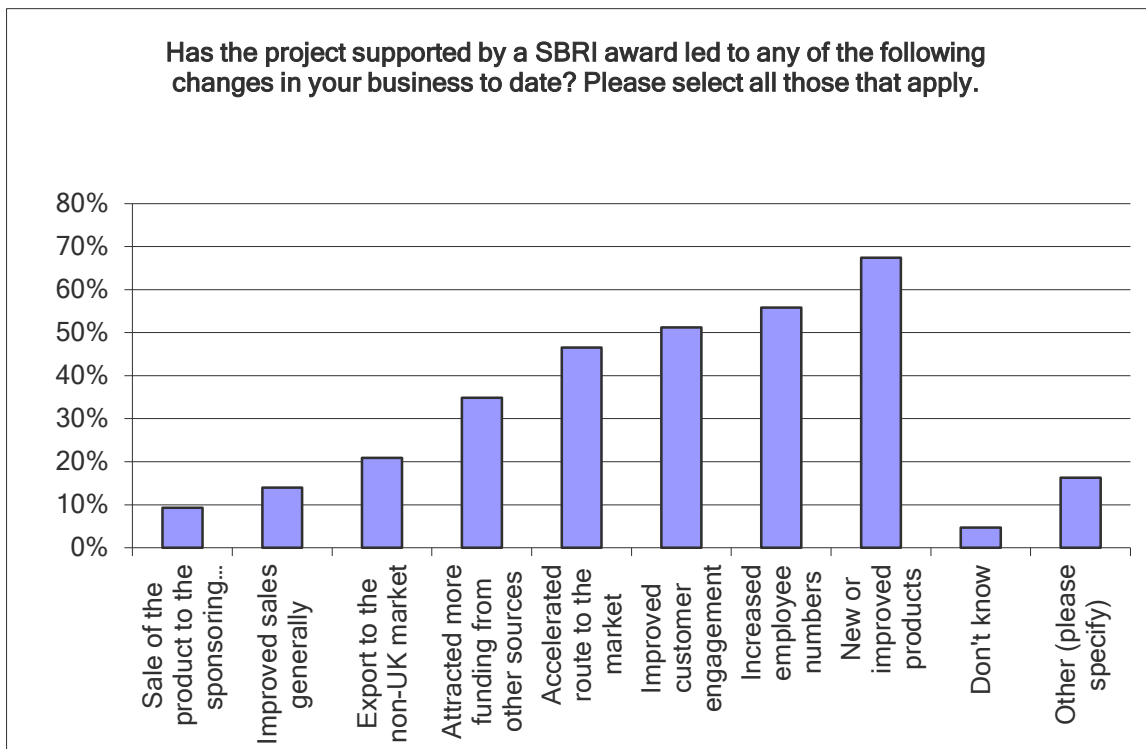
- Businesses had difficulty with 'what happens next' after the SBRI process – with no further financial support and direct link to potential customers, many firms, especially SMEs, found it challenging to secure sales after the SBRI project.
- SBRI works well when the challenge is appropriately specified and 'owned' and managed by a project officer who understands and is committed to the SBRI approach.

Main findings of the SBRI workshop participants survey

We conducted a short, online survey of SBRI participants who also attended the SBRI round table discussions in a workshop. This survey focused on the business impact of SBRI, and received 43 responses out of around 70 delegates who signed up to the workshop. These respondents participated in SBRI competitions between 2011 and 2016, and about half of them started the project in the past two years.

Figure 7 below shows 67% (29) of these respondents reported developing new or improved products as a result of participating in an SBRI programme, and 56% (24) reported increasing employee numbers. SBRI has helped these firms improve their customer engagement, accelerate route to the market, attract funding and export. However, only 14% (6) of respondents have improved general sales, and only 9% (4) achieved any sales to the sponsoring departments. These weaker results on sales were partly due to that half of respondents only started the project in the past two years. This result contrasts to the SBRI evaluation survey finding that of 2011 and 2012 competition winners, 42% had secured sales, which may reflect that there had been a longer time period following the competitions.

Figure 7: Impact of SBRI on business outcomes



Source: Survey of SBRI workshop participants conducted in February, 2017.

Table 8: Additionality of SBRI support

Without SBRI support would the project have been...?

Answer Options	Response percentage	Response Count
Exactly the same as it was with SBRI support	0%	0
Completed more quickly	5%	2
Don't know	5%	2
Completed but with less of your time or resources invested	7%	3
Completed but it was less ambitious e.g. lower risk or less innovative	9%	4
Completed more slowly	21%	9
Started much later	26%	11
Others (please specify)	28%	12
Of which: 9 respondents (21% of all respondents) reported the project wouldn't have started or completed		

Source: Survey of SBRI workshop participants conducted in February, 2017.

Table 8 above shows a majority of respondents (91%, 39) reported the additionality of SBRI in that they felt their projects would have been adversely affected without SBRI. The other 9% either did not know what the effect of SBRI was, or felt SBRI slowed their project down. Of those reporting the additionality, 26% (11) reported the project would have started much later and 21% (9) stated the project would not have started or completed. A further 16% of respondents (7) proceeded with the projects but in a reduced scale, and another 21% (9) reported the project would have been completed more slowly. The remaining 7% (3) reported various adverse impacts without SBRI support, including a reduced level of collaboration; smaller chances of commercialisation; and development of technology.

Summary of SBRI workshop roundtable discussions on business impacts

In addition to the above survey findings, SBRI workshop participants reported on wide impacts of SBRI on their businesses during the workshop, summarised as follows:

- Participating in SBRI allowed collaboration and networking, opening the door to new customers.
- However, sales were often not to the department/ agency running the competition. This was an issue especially in health sector due to the complexities of NHS

procurement. Some healthcare companies have successfully sold to private providers who supply the NHS or sell their products overseas.

- Participants felt they had developed market knowledge about the public sector that they would not have otherwise gained, and built credibility within the sector.
- Some businesses had difficulty with ‘what happens next’ after the SBRI process. SBRI money cannot be used for sales, and SMEs don’t have a great deal of resources. Resources had also been diverted from business-as-usual.
- Participants found they had publicity/ PR gains, and were able to generate a ‘buzz’ from taking part in the competition. Participation enabled access to exhibitions and showcases, and also access to large organisations who otherwise would have been out of reach.
- On Intellectual Property (IP), unanimous feedback that retaining IP was one of the critical advantages of SBRI and companies were able to exploit IP via licensing agreements. Retaining the IP allowed businesses to continue working on the products after the project finished.

Summary of case studies

Case studies were developed for four companies and one university research group that participated in SBRI at both Phase 1 and Phase 2. The organisations were selected from attendees at the SBRI workshops (and are therefore self-selected to a certain extent) with the key criteria being coverage of a number of different departments and agencies using SBRI.

The aim of the case studies was to describe the company journey through SBRI to better understand how participation leads to benefits (or otherwise) and to identify strengths and weaknesses of SBRI from the company perspective. The case studies covered eight SBRI competitions from the MOD, DH, DCMS, HO, DfID, Innovate UK, Belfast City Council and Rail Safety and Standards Board (RSSB) (two companies participated in more than one SBRI competition). Details of these case studies can be found in Annex 3. Below we outline key findings from these studies.

Key findings:

- Four phase 2 projects have completed and all have resulted in a new product that has been tested in an operational environment with end-users. One has led to sales to the SBRI customer (i.e. the public sector challenge ‘owner’) and one has led to a follow-on SBRI project with a different public sector body that is expected to lead to sales. Another has a product that is being implemented by some of its existing customers and the final project resulted in an MOD-funded Phase 3 project that has been demonstrated to defence contractors.
- The four companies were all micro-enterprises when they responded to SBRI competitions and SBRI provided them with secure funding to invest in product development and, importantly, the associated recruitment of skilled staff. The

companies have grown, and have future growth aspirations, but remain small (the largest currently has 12 employees).

- SBRI has an administrative and funding model that is attractive to small businesses. The 100% contract funding, limited bureaucracy, IP ownership and demand-led innovation challenge are positive features.
- The key challenge for companies is securing sales after the SBRI project. This is particularly challenging when the competition is not directly linked to a potential customer (as is often the case with many DH and Innovate UK competitions for example).
- SBRI works well when the challenge is appropriately specified (not over-specified to assume a particular solution nor so vague as to be undirected) and 'owned' and managed by a project officer who understands and is committed to the SBRI approach.

4. Data Collection, Monitoring and Evaluation

Key points

- The current SBRI management data collection processes have limitations that are a barrier to effective monitoring and robust evaluation of SBRI.
- We recommend a phased data collection approach and a new data management system to collate, store and disseminate SBRI programme data at both competition and firm level.
- We recommend that the central SBRI administrative body and participating departments / agencies develop and commit to an evaluation plan that employs a range of methods to ensure the robust assessment of SBRI outcomes and impacts.

Monitoring and Evaluation of SBRI

This section identifies issues in the current SBRI data collection processes and makes recommendations for addressing these issues and for future monitoring and evaluation of the SBRI programme.

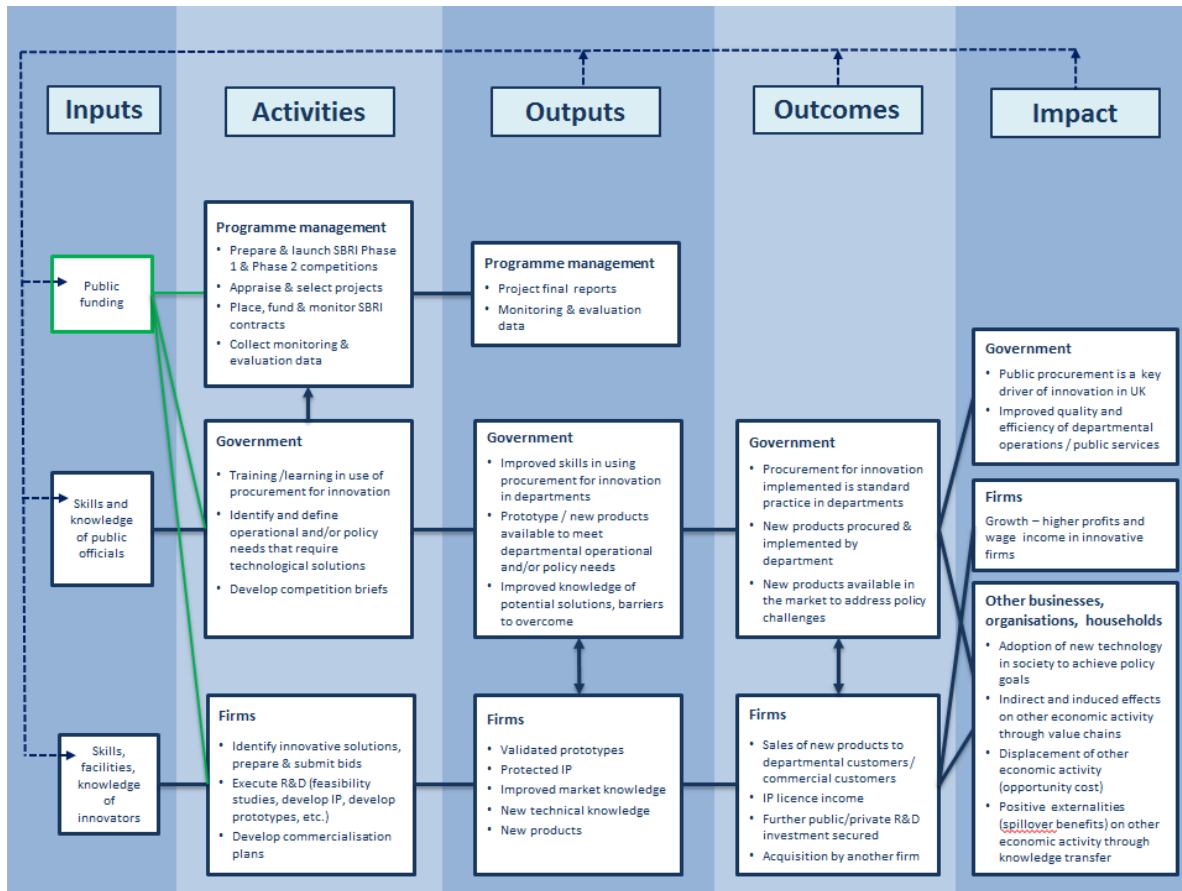
The monitoring and evaluation of SBRI needs to be guided by a clear statement of the programme objectives and a logic model that links programme inputs and activities to the expected outputs, outcomes and impacts.

The monitoring and evaluation aims to:

- Assess how the SBRI programme has performed against its delivery plan and programme objectives
- Identify the impact of SBRI activities on businesses, economy and the wider innovation system

Figure 8 below presents a logic model which could be used for SBRI. It describes inputs and activities, which lead through to outputs, outcomes and impacts, which in turn can affect the inputs in a dynamic cycle.

Figure 8: Logic model for SBRI



Evaluation questions

Future evaluations should assess programme performance against the logic model. The overarching evaluation question is:

- Did the programme meet its objectives to:
 - Stimulate innovation in the economy by supporting firms to develop and commercialise new technology-based products and solutions;
 - Provide government departments and their agencies with new, cost-effective, technical and scientific solutions.

This leads to more specific evaluation questions that include (but are not limited to):

- Did the use of SBRI by departments and firms meet programme targets?
- Has SBRI participation resulted in new products being developed to meet departmental needs?
- Have departments implemented the solutions/products delivered by firms participating in SBRI / Have firms sold solutions/products to departments?
- Have firms made sales of new products developed under SBRI to other customers in public and/or private sectors?

- What other benefits and costs has SBRI brought to participating firms?
- Have other firms benefitted from knowledge generated through the programme and adopted/innovated/grown as a result?
- How have departments benefited from the solutions developed under SBRI – in terms of operational and/or policy goals?
- How have departments, agencies and firms incurred costs – e.g. administrative costs, opportunity costs, through the SBRI scheme?
- What are the effects of SBRI in terms of improved public services, delivery of public policy, growth of innovative firms and the wider economic effects of this growth (indirect and induced effects on other economic activity, spillovers etc.)?

Evaluation timescales

Outcomes and impacts take time to accrue, with sales of innovative products likely to occur several years after the project has ended. A complete SBRI cycle of a Phase I and Phase 2 project takes at least three years and therefore, if SBRI is re-launched, an impact evaluation should take place no sooner than five years after the re-launch. An interim evaluation should be conducted two years after programme re-launch to review the implementation of programme improvements and their effects on the scale and nature of inputs and activities.

Evaluation Challenges

The evaluation will face challenges typical to innovation policy interventions:

- **The long timescales** between investment in R&D and successful innovation and effects on firms (commercialisation) and, on longer timescales still, effects on the wider economy (often through diffusion and adoption). While this means that evaluations need to take place after sufficient time has elapsed, it also creates additional evaluation risks such as: companies changing ownership and therefore no longer contactable or identifiable in company registers/databases; loss of corporate memory of the programme and its role in company development.
- **The high risk** nature of investments in innovation. As a result the impacts are highly skewed – some projects will fail to develop products that reach the market, a small number will have significant impact and others will have a modest impact. *The evaluation challenge is ensure all levels of project success (or otherwise) are captured in the sampling frame used (particularly challenging with self-reported data) and appropriate methods are used to gross up from samples to populations.*
- **Attribution** - identifying what outputs, outcomes and impacts are caused by the programme as opposed to other factors and relatedly what would not have happened in the absence of the programme. Innovation systems are complex with multiple channels, which makes it difficult to attribute causality when looking at the empirical data to answer the questions such as: was a new innovation driven by support from the programme and to what extent was growth of an industry caused by knowledge transfer relating to that new innovation?

Evaluation metrics and indicators

Robust evaluation requires comprehensive metrics and indicators to measure the activities and effects of the SBRI programme over a long period of time and to assess whether the programme has achieved its objectives.

The impact of innovation policy intervention is often measured through traditional indicators such as turnover and employment of the businesses, volume of R&D performed, or IP registered and licensed. While these indicators are useful, we also require metrics to capture wider impacts of the programme on other firms and on the innovation ecosystem, and metrics to assess the scale and efficiency of programme delivery. In the following, we outline a list of indicators for evaluating and monitoring SBRI across the entire programme logic model:

Indicators for programme inputs and activities

- Monitor the scale and efficiency of programme delivery (at programme and department level) including
 - *funding allocated and expended for SBRI*
 - *number of SBRI competitions launched (number that are operational and policy focused)*
 - *number of projects funded at Phase 1 and Phase 2*
 - *value of Phase 1 and Phase 2 contracts*
 - *success rate of applicants*
 - *profile of applicants (company size, sector, location, etc.)*
 - *number of projects that convert from Phase 1 to Phase 2*

Indicators for output, outcome and impact

Objective 1: supporting technological innovation

- Direct effects of the programme on participating firms
 - *whether SBRI participation resulted in a new product or process being developed*
 - *sales and profits of products developed via SBRI to*
 - *challenging 'owning' department or agency*
 - *other public sector organisations*
 - *the private sector*
 - *overseas markets*
 - *licence income*
 - *direct employment and productivity (wages) related to SBRI participation*
 - *further investment in R&D/ the innovation*
 - *patents (or other intellectual property) associated with the innovation*

- Metrics incorporating broader effects on participating firms (to be compared to baseline data)
 - *total sales*
 - *total employee numbers and average wages*
 - *proportion of sales from exports*
 - *total R&D/ innovation investment*
- Indicators of impacts on other firms, sectors, organisations (and ultimately households)
 - *adoption levels of technology/product/process by other firms in the same industry and in related industries*
 - *changes in profits and wages in other firms through value chains (supply chains and product markets), controlling for other factors*
 - *changes in profits and wages in other firms in the same and other industries, controlling for other factors*
 - *impact on other firms through displaced/crowded out economic activity in the counterfactual⁷ (using exogenous assumptions on displacement levels if not directly measurable)*

Objective 2: supporting Government departments/ agencies to find solutions to their own policy / operational needs

- Direct effects on participating Government departments/ agencies:
 - *number of SBRI projects resulting in procurement by the ‘challenge owner’ department or intended customer where difference; value and relative value of that procurement*
 - *procurement expenditure in the area directly related to the innovative products/processes developed via SBRI (cost up or down)*
 - *qualitative assessment of impacts on departments/ agencies which are not directly financial (quality impact)*
 - *does the product/process fulfil a need that was previously unfilled, if so what benefit does it bring?*
 - *does the product/process fulfil a need in a better way than it was previously fulfilled – and if so how much better?*
 - *wider effects on public procurement processes*

⁷ This relates to the question of, if SBRI were to lead to increased resources (capital, labour and so on) being used in participating and other firms, which are growing as a result, how would those resources have been used in the absence of the programme and how productive would they have been? Would investment have gone into those or other industries? In the UK or abroad? Would there have been more unemployment and/or lower productivity?

Evaluation methods

The evaluation should use Contribution Analysis, based on a mixed methods approach, to determine the contribution of SBRI to the observed effects and a causal link between the programme’s activities and the effects. Table 9 provides a mix of qualitative and quantitative evaluation methods that can be employed to gather evidence for the contribution analysis. Using a combination of these methods will allow the triangulation of evidence collected by different approaches, thereby overcoming limitations of a specific method and providing more reliable results.

Table 9: Evaluation methods

Method	Detail	Purpose
Econometrics (such as Difference in Differences)	A set of methods to provide statistical estimates of impacts of an intervention. It requires analysis of differences in performances between participating firms and comparable non-beneficiary businesses before and after the intervention. It controls for the effects of factors other than SBRI which may have influenced the outcomes and impacts.	To assess the impact of SBRI compared to a counterfactual on business performance as measured through key metrics such as sales, productivity and employment.
Before-and-after analysis	Analysis of firm and departmental performance before and immediately after SBRI. This is the simplest but least robust quantitative evaluation method. Thus, it is only suitable for interim evaluation, not for long-term impact evaluation.	To assess direct effects of the programme on participating firms and public bodies
Trend analysis and sector modelling	Trend Analysis (TA) compares post-intervention results with a projection of the historical trend that a business, for example, experienced prior to SBRI support. The historical trend establishes a counterfactual and any divergence from that trend is attributable to the intervention, provided other factors are accounted for. TA may also be an important method to understand changes in an industry trend (sector modelling) to assess a wider impact of SBRI on the sector.	To identify the effects of SBRI supported innovation on the participating firms and wider impacts on the industry
Case studies	Case studies can be conducted through semi-structured interviews with participating firms and public bodies.	To assess direct and wider effects of SBRI on departments and firms To understand mechanisms that drive impact To identify strengths and weaknesses of the SBRI

In-depth interviews with key stakeholders	Views from industry and government stakeholders, combined with results from other methods, will help unpick additionality of the programme and assess spillover effects.	To assess additionality and spillover effects of the programme.
Expert consultation	Use expert consultation to acquire specialised input to understand wider impacts at the local and national innovation system level. Experts can be invited to review, assess and validate impacts identified from other evaluation methods.	To understand wider impacts on local and national innovation systems. To provide review of evaluation evidence.

Data collection for monitoring and evaluation

Current data collection processes and limitations

In this study, we've used Innovate UK management data to examine the usage of SBRI by the public bodies. This centrally held management data consists of detailed information for each competition launched by each department and agency, as listed below:

- Competition type, title
- Brief competition descriptions
- Competition dates – opening month, close month and decision month
- Sponsoring department
- Numbers of applicants for each competition by phase
- Numbers of contracts for each competition by phase
- Total contract value for each competition by phase
- Value of Innovate UK co-funding for each competition

Apart from the above competition data, Innovate UK holds partial information on the characteristics of applicants and winners aggregated at competition level. These characteristics include organisation type, firm size, business age, and the region where the organisation is registered or located. However, such characteristics information is only available for some of the competitions. The current Innovate UK management data contains the information on characteristics for 30-50% of all applicants, which may lead to biases in assessing usage of SBRI by firm characteristic.

In addition to the data centrally collected by Innovate UK, some departments and agencies hold SBRI records for individual applicants and winners, but they have not been stored in a consistent format, nor collected in a standardised approach, and others do not collect (or keep records) of this information.

Furthermore, sponsoring departments have no obligations to provide information about individual winners and applicants to Innovate UK. This makes it difficult to track down individual applicants and winners over time. As a result, we only have a limited view of the

programme, especially with regard to impacts and outcomes of SBRI accrued over time. These data limitations echo the main barriers identified by the SBRI Evaluation Report to enhancing the understanding of the SBRI programme.

Another drawback in the existing data management system is the lack of the ability to link SBRI management information with external business data. Information on business identification such as the registration number and Unique Tax Reference (for non-registered businesses) will facilitate linking self-reported data and management information to external business databases/registers, for example, Companies House and the Interdepartmental Business Register (IDBR). This in turn can help verify and enrich self-reported and management data with a wealth of information available from external business databases and registers. Moreover, data-linking could significantly reduce respondent burdens in a future evaluation survey by utilising information already available in an external database.

Data requirements for monitoring and evaluation

Evaluation of the effect of SBRI on participants requires information on participants' past performance (baseline data) and their performance during and after the SBRI contracts. As it generally takes several years for firms to derive the maximum commercial benefits from their SBRI supported projects, there is a need to track and monitor business performance of individual winners/applicants over time.

In addition robust evaluation of impacts and outcomes of SBRI requires a comparative or counterfactual perspective to measure the additional impact associated with the policy intervention. Therefore the proposed evaluation methods not only require data on participants' performance before and after the SBRI contracts but also on the performance of similar companies over the same time period.

Therefore, in addition to the SBRI competition data that Innovate UK has collated, as outlined above, we recommend key SBRI data generated by each stage of the process should be collected by sponsoring departments and shared with the central SBRI administration body, as part of contract obligations. In the following, we provide an indicative list of data that is required to fill the existing evidence gap, which should be collected during the delivery of the SBRI programme:

- Data collected at the application stage
 - Information that allows for identifying and tracking applicants: the company registration number (if registered); Unique Tax Reference (for unregistered businesses); name; contact details; trading and register address; business age and sector
 - Baseline business performance indicators (self-reported), such as sales ; numbers of employees; profits; average/median earnings and current R&D/innovation spend and whether they export
- Data collected at the decision stage
 - Value of individual contracts
 - Identification of winners that is linked to the characteristics data collected at the application stage
- Data collected at the end of each phase

- Outputs and outcomes, such as whether objectives met; any prototype and new products developed; sales achieved, costs incurred
- Benefits and costs to the sponsoring department or wider society, e.g. in terms of potential costs savings, improved efficiency or implementation issues with the new solutions developed; and/or progress towards policy goals.

Improved SBRI programme monitoring data will provide key evaluation data to assess the delivery of the programme and provide baseline information to examine the outcomes and impact. In addition to the monitoring data including baseline data collected through the SBRI process, we need to capture information on long-term impacts and outcomes over time, such as Intellectual property rights, business outcomes after the intervention to be compared with baseline data collected at the beginning the SBRI process. This could be achieved through a follow-up evaluation survey and/or data linking to external business databases. Another option is to ensure all SBRI participants submit follow-up data on long-term impacts and outcomes as part of their contract obligations.

Firm-level data including firm identifications will provide a sampling frame for evaluation surveys and facilitate data linking to external business databases to capture required follow-up data for comparison of firms' performance against similar firms which did not receive SBRI contracts, feeding into evaluation methods outlined in Table 9 for an assessment of positive externalities (spillover benefits) to other firms in the same value chain or industry.

Data management, protection and transparency

As more comprehensive data at firm level will be systematically collected, we recommend the central SBRI administrative body set up an effective data management system to collate, store and manage SBRI programme data at both competition and firm level, enabling more efficient data interrogation and dissemination. This system should ensure commercial confidentiality and information security.

More specifically, all data provided to the central SBRI administrative body, and through the evaluation methods, will be treated in confidence. Data will be reported in an aggregate form and no individuals or firms will be identifiable, unless previously agreed to (e.g. for providing Case Study examples). The evaluation and data collection will take place in accordance with the Data Protection Act 1998 and security measures will be in place for any linking, transfer or sharing of such data.

Finally, we recommend the central SBRI administrative body improve transparency and dissemination of SBRI management data by creating a searchable database, enabling easy, secure and user friendly access to project data.

Conclusion and Recommendations

The current data collection processes are insufficient for effective monitoring and robust evaluation of SBRI. We recommend:

- The central SBRI administrative body and participating departments / agencies should develop and commit to an evaluation plan that encompasses a range of methods to ensure the robust assessment of SBRI outcomes and impacts
- The central SBRI administrative body set up an effective data management system to collate, store and manage SBRI programme data at both competition and firm level at every stage of SBRI competitions through to project completion, enabling more efficient data interrogation and dissemination.
- The data management system should ensure that firm data can be accurately linked to external sources of business data.
- The data should be collected by sponsoring departments and shared with the central SBRI administration body in a standard format (or into a standard database directly) as part of contract obligations.
- The central SBRI administrative body should improve transparency and dissemination of SBRI management data by creating a searchable database allowing easy, secure and user friendly access to project data.