

A Review of the Small Business Research Initiative

FINAL REPORT

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Manchester Institute of Innovation Research with the
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Table of Contents

Executive Summary	5
E1 The Study.....	5
E2 Programme Baseline: Use of the Programme; Target Setting Process; Data Collection and Management.....	6
E2.1 Main Findings	6
E2.2 Recommendations.....	7
E3 Programme Processes.....	7
E3.1 Main Findings	7
E3.2 Recommendations.....	9
E4 Programme Impacts.....	10
E4.1 Main Findings	10
E4.2 Recommendations.....	12
1.0 Introduction	13
1.1 The Structure of the Report.....	13
Part One – Terms of Reference and Programme Overview	14
2.0 The SBRI Programme	15
2.1 The Terms of Reference.....	15
2.2 Review of Programme: History, Rationale and Logic.....	15
2.2.1 History of SBRI	15
2.2.2 Frameworks for the Policy.....	18
2.2.4 Programme Rationale and Logic.....	21
2.2.4 The SBRI Process.....	25
Part Two – Presentation of Findings.....	30
3.0 Findings: Programme Baseline: Use of the Programme; Target Setting Process; Data Collection and Management.....	31
3.1 Introduction.....	31
3.2 Review of Programme Use – A Baseline of Departmental Usage.....	31
3.2.1 Overview.....	31
3.2.2 Analysis of Departments (all periods: October 2008 – July 2014)	33
3.2.3 Comparison between three periods.....	42
3.2.4 Mode analysis – policy versus operational.....	44
3.2.5 Firm size breakdown (October 2008 – July 2014)	47
3.2.6 Region breakdown (October 2008 – July 2014)	48
3.2.7 Overall trend analysis (December 2008 – July 2014).....	49
3.3 Review of Programme Use: Experiencing SBRI: The Company View	52
3.3.1 Introduction	52
3.3.2 Profiling SBRI applicants	52
3.3.3 Who applies for SBRI?	53
3.3.4 Approaching the SBRI scheme	57
3.3.5 Applying and winning Phase 1 support	59
3.3.6 Applying and winning Phase 2 support	61
3.3.7 Observations	62
3.4 The Target Setting Process.....	63

3.4.1	Target Setting	63
3.4.2	Changes Resulting from the Target	65
3.4.3	The Effectiveness of the Target	71
3.5	Data Collection and Management	72
3.5.1	Information Generated in the SBRI Programme	72
3.5.2	Data Management Requirement	73
4.0	Findings: The SBRI Process	75
4.1	Challenges Formulation and Overall Programme Design	75
4.1.1	The Experience of Public Sector Bodies	75
4.1.2	The Experience of Firms	76
4.2	Competitions – Phase 1	77
4.2.1	The Experience of Public Sector Bodies	77
4.2.2	The Experience of Firms	77
4.3	Competitions – Phase 2	78
4.3.1	The Experience of Public Sector Bodies	78
4.3.2	The Experience of Firms	78
4.4	Post-Competition	79
4.4.1	The Experience of Public Sector Bodies	79
4.4.2	The Experience of Firms	79
5.0	Findings: The Impacts of the Programme	81
5.1	Introduction – Types of Impact	81
5.2	Firms and Impact	82
5.2.1	Introduction	82
5.2.2	Subjective impact assessment – effects on sales	82
5.2.3	Assessing impacts – econometric analysis	83
5.2.4	Cost-benefit calculations	86
5.2.5	Strategic value added (Firms’ Capacity Benefits)	91
5.3	Public Sector and Impact	94
5.3.1	Introduction	94
5.3.2	The Policy Goals of Government	94
5.3.3	Government Operational Needs	95
5.3.4	Capacity to Operate the SBRI Programme	96
Part Three - Conclusions and Recommendations		98
6.0	Conclusions and Recommendations	99
6.1	Baselines, Targets and Data Collection and Management	99
6.1.1	Conclusions	99
6.1.2	Recommendations	101
6.2	Process	101
6.2.1	Conclusions	101
6.2.2	Recommendations	103
6.3	Impact	104
6.3.1	Conclusions	104
6.3.2	Recommendations	105

Annexes	106
Annex 1 Public Sector Users of the SBRI by July 2014 (WP1).....	107
Annex 2 Competitions excluded from financial analysis.....	108
Annex 3 List of Organisations Responding to the Study.....	109
Annex 4 Conducting the Company Surveys.....	111
Annex 5 Firms Applying During 2013-14	177
Annex 6 Qualitative feedback on MOD Competitions.....	186
Annex 7 The Terms of Reference for the Study	188
Annex 8 Technology Readiness Levels	190
Annex 9 References.....	191
Annex 10 The Study Team.....	193
Annex 11 Department Based Analysis Breakdown Across the Three Periods.....	194
Annex 12 Table of Tables	199
Annex 13 Table of Figures	201

Executive Summary

E1 The Study

E1.1 This study is an evaluation of the UK's Small Business Research Initiative (SBRI) programme, and was commissioned by Innovate UK, which has developed and managed the SBRI for UK Government. The SBRI aims to provide a lead customer for technological (product or service) innovation by means of a normally two-stage competitive process in which firms seek to demonstrate the scientific, technical and commercial feasibility of their product or service idea and, at the second stage, to develop a prototype. Government departments use SBRI to engage with industry to define and meet (a) government's operational requirements (challenges) and or (b) the need for more general innovations to address specific policy problems where the government will not itself be a purchaser of the innovation but where the market if left to itself might not be expected to deliver solutions. The programme is an important support for innovation. At the end of the SBRI process, innovations have been developed to the point where volume production is the next step and market competition can take place.

The study's terms of reference were to answer the following three questions:

- 1) to draw up a baseline of SBRI use and thereby to understand the effect of the announcement of new departmental targets announced in the Spending Review 2013 upon the use of SBRI by departments and other public sector bodies;
- 2) to conduct a thorough review and investigation of the SBRI process by which the programme realises its mission and achieves its impacts; and
- 3) to conduct a detailed review of the impacts achieved by the programme.

E1.2 The report has three main parts, and begins with a short introduction:

- 1) Part one covers the terms of reference for the study and the review of the programme's context, aims, objectives and operation.
- 2) Part two is the main section of the study. It has three chapters. The first of these chapters presents a baseline of programme operation, with perspectives from departments and from firms on the impact of the targets. The second chapter in part two reports the findings on the implementation and operation of the programme. The third chapter in part two provides the impact assessment.
- 3) Part three provides the conclusions and recommendations of the study.
- 4) Annexes provide further background to the study, explanations of the methods used by the study team, further data on the programme operation, and references.

E2 Programme Baseline: Use of the Programme; Target Setting Process; Data Collection and Management

E2.1 Main Findings

- E2.1.1 The UK SBRI programme has seen increasing use since 2008-09 when it was revised and re-introduced following a review of its effectiveness that had found that departments had not engaged with it as intended. Since the review in 2008 and re-launch in 2009, use of the SBRI has risen steadily with over £200m spent through the SBRI programme as of mid-2014.
- E2.1.2 An increasing number of public sector bodies are using the programme. There are now 70 public sector bodies that have taken part in the programme. Use of the programme is concentrated within a small number of departments however. In terms of the percentage of the total SBRI money spent by mid-2014, the Ministry of Defence (MOD) accounts for 20% of the total, the Department of Health (DH) and the National Health Service (NHS) 21%, the Department for Energy and Climate Change (DECC) 14%, and the Department for Business Innovation and Skills (BIS) directly or through Innovate UK (28%). These are the main user departments in terms both of the number of challenges promoted and the value of the contracts awarded to firms.
- E2.1.3 Innovate UK is also an important contributor to the scheme financially, providing funding where it is responsible for the formulation of challenges that address key public policy objectives (£58m over the period 2008 to July 2014), but also co-funding challenges that are led by, or which involve, combinations of departments (£26.3m over the whole period 2008 to July 2014). MOD, DH, DECC and BIS account for at least 83% of all programme money spent, this percentage being possibly slightly higher as the study has not been able to identify all of the Phase 2 awards made through MOD.
- E2.1.4 We note that over the whole period of the programme's operation, half of the firms which applied for SBRI funding had fewer than 10 employees, although the programme also had applications from large firms. Our estimate based on the sample of data provided is that 25% of firms that applied had more than 250 employees. Again, based on the data we have available about firm size of applicants, which is limited to 1764 applications, firms with fewer than 10 employees were awarded around 41% of the total money, while firms that were larger than 250 employees received 30% of the total money spent.
- E2.1.5 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 over £100m in 2013-14 and to over £200m in 2014-15. Those key departments were the following (with their 2013-14 target in brackets): MOD (£50m), the NHS and DH (Health) (£30m), Department for Transport (DfT) (£7m), The Home Office (HO) (£7m), DECC (£3m) and the Department for Food and Rural Affairs (DEFRA) (£3m). The aim of the target was to increase utilization of the programme "across all departments". The SBRI target which was set in the Spending Review 2013 has had two main, somewhat contrasting, effects: on the one hand, departments consider it to have given a well-justified emphasis to a scheme which has the potential to contribute in a number of ways to the UK economy and society through its use by a range of public sector bodies; however, it has caused some confusion and frustration as the targets set have been regarded by some of the department interviewees as "simplistic and inflexible" and perhaps "ill-informed".

E2.1.6 The programme management team has a limited view of key aspects of the programme, arising from the fact that there is no single integrated database of SBRI applicants or winners. Instead, departments have non-standardized approaches to data collection and management and, at present, report only summary information about applicants and winners to Innovate UK. The provision of information for scheme and financial management and impact assessment purposes is therefore very limited, making it more difficult, for example, to monitor the impact of the programme on specific firm size bands or sectors.

E2.2 Recommendations

E2.2.1 Any assessment of the success of the SBRI depends to a significant extent upon how much is known about the operation of the programme. Existing systems of information management in the programme fail to provide a sufficient level of understanding of which firms apply to and win support from the programme and how departments benefit from the programme.

We recommend that information management and performance management of the programme should be supported by an information management system which can provide timely and standardised information, to all users of the programme, on clearly identified applicants and participants. Such information should also provide details for future monitoring and evaluation, both within Innovate UK and by other public sector users of the programme. The participation of firms in the programme should be tracked centrally, for example using company registration numbers, allowing cross-referencing to other data sources for impact assessment purposes and policy development within Innovate UK and within individual user departments.

E2.2.2 Evidence concerning the effect of the target is conflicting. The use of targets appears to have been associated with greater use of the programme, although it is difficult to say with confidence that increasing use resulted directly and exclusively from the target. Increasing use of the programme pre-dates the announcement of the target, yet departments that implement the target have increased their use of the programme more than those which do not have a target. The current rate of use is still well below target in the current year 2014-15.

We recommend that a target is kept in place but that the target should be made more flexible to take account of the capacity for and level of usage within departments, departmental budget cycles, and fluctuating rates of uptake (particularly in the case of small departments and bodies). Departments should be encouraged to participate actively in the new target setting process.

E3 Programme Processes

E3.1 Main Findings

E3.1.1 The majority of firms interviewed and surveyed by the study team believe that the SBRI is sound in concept and effective in practice. Departments believe that the process is helpful to them and is effectively managed by Innovate UK. The role of Innovate UK in developing challenges and

supporting departments has been positive; there are high levels of satisfaction amongst departments with the role played by Innovate UK.

- E3.1.2 As yet, SBRI is not routinely considered by departmental senior staff as a mechanism that can be used either for operational or policy purposes. Responsibility for using SBRI lies at relatively low levels in departments and is not considered by departments as a policy tool that can be used strategically.
- E3.1.3 Signposting to other available forms of support for firms that have completed SBRI (whether successful in competitions or not) could be improved. Firms vary in their abilities to secure further funding at exit from the programme either at Phase 1 or at Phase 2. Evidence from interviews suggests that a substantial number of firms may be unaware of where to access further funding.
- E3.1.4 The SBRI Healthcare has provided Phase 3 support and intends to do this in the future where budgets and the flow of companies from Phase 1 and Phase 2 allow it. The use of a Phase 3 appears to be a valid and effective way of extending the operation of the programme to cope with specific and complex innovation contexts. This extra layer of support has never existed in the rest of the programme (i.e. outside Health), but a small number of interviewees expressed the view it would be desirable.
- E3.1.5 The recent move in the area of health technology development to make regular challenge announcements on a six monthly cycle was reported to have increased awareness of SBRI amongst potential applicants. In other technology areas, some firms expressed the view that regular challenge announcements would enable better strategic planning for funding applications.
- E3.1.6 Generally, communication between Innovate UK and departments and between Innovate UK and firms was reported to be “good”. Within the programme, responsibility for feedback on project related issues varies from competition to competition with departments more often engaged in feedback activities at Phase 2, although examples of extensive feedback were reported during Phase 1.
- E3.1.7 Firms appreciate the competitive aspect of the programme and the broad scope of the innovation challenges. This encourages creative thinking and which leads to innovation. Even when challenges are complex and broad in scope, small innovative technology companies are not discouraged from applying to the programme.
- E3.1.8 The SBRI process has been ‘catalytic’ in that it offers an opportunity to develop and trial potential products that would normally remain on the drawing board. SBRI has acted as a stimulus for firms to operationalise ideas. Firms did not mention whether alternative modes of funding had been sought, but our conclusion is that without the ‘signal’ from departments provided through SBRI that potential markets existed, projects might not have evolved beyond the conceptual stage. Thus, the scheme has had a significant stimulus effect in getting nascent ideas further towards commercialisation and has acted as an important funnelling process. Major contributory factors to this were the indication that a market for such products existed (which is implicit as part of the challenge-led approach) and the opportunity to shape their development through close discussions with a range of interested stakeholders. The early-stage networking/workshop events were also generally seen as a positive feature in these regards.

- E3.1.9 The ability to retain intellectual property rights (IPR) developed under the programme was regarded very positively by firms. Nevertheless, the time taken to obtain a patent from work done in an SBRI competition can be long.
- E3.1.10 In terms of direct impact, participation in SBRI offers companies the opportunity to explore and develop potential markets (at reduced risk), increase their internal skills capacities, expand the number of employees (full-time or contract staff) and develop links with companies in the same or related sectors (both suppliers and competitors). Evidence of positive impacts on direct sales was also reported. Many companies welcomed the additional opportunities provided by sponsoring departments to showcase their products through a range of activities or to gain access to the departments' networks of stakeholders.
- E3.1.11 The simple application process was generally well-regarded and very few payment issues were encountered.
- E3.1.12 Participation in SBRI was seen as a positive attribute when applying for additional government or other sources of support.
- E3.1.13 The evidence indicates that there is some repeat application to the programme, but data limitations do not allow for an estimate of the extent to which serial applications are taking place.
- E3.1.14 Overall, SBRI was seen to offer a unique, flexible mechanism by which highly innovative projects could be supported and a high level of autonomy on how the firms ran the projects. This autonomy was seen to result from the programme being contract-based rather than grant-based.

E3.2 Recommendations

- E3.2.1 As yet, the SBRI is not yet recognized at senior levels in departments as a programme that can and should be used as a matter of routine to achieve departmental objectives. This is despite previous efforts by Innovate UK. It is not surprising that a new way of meeting government departments' policy and operational needs – such as SBRI – is not immediately taken up. While many aspects of the programme are relatively simple to implement, the process of formulating a broad challenge area and a competition from a range of departmental objectives needs some new capabilities in departments, involvement from staff at a senior level, and the accumulation of experience at all levels to make the process effective and efficient.

We recommend that Innovate UK and its parent department, BIS, revisit their attempts to raise the level of interest in SBRI at the highest departmental levels, to spread good practice and enhance capability.

- E3.2.2 Innovate UK has generally discouraged the programme from being operated as and perceived as a collaborative research programme, preferring to use and promote the competitive aspect and this is appreciated by firms.

We recommend that inter-firm networking and collaboration at the pre- or early project stage be promoted through kick-off and workshop events where it will develop contacts between successful Phase 1 participants and stimulate potential cross-fertilisation of complementary ideas. Further support to firms at the pre-challenge phase on partnering

and on how best to formulate applications to the programme might be provided. Such support is recommended in US government department implementations of their similar SBIR programme.

E3.2.3 The ability to retain IPR was regarded very positively by firms, provided simple arrangements are in place to ensure this. However, in some competitions within the NC3RS context, despite the existence of 3 way contracts to protect IP, smaller firms had concerns that larger organisations participating as partners alongside government habitually work with more complex legal frameworks, particularly regarding IPR, which could adversely affect these smaller firms.

We recommend that Innovate UK should ensure that where large third party organisations are involved in SBRI, the programme's set of guidelines for IP, which normally encourage participation, are effectively promoted.

E3.2.4 As SBRI competitions normally operate over a period greater than one year,

We recommend that greater budgetary flexibility within departments is given in order to overcome the issues associated with annualised budget cycles. There are signs that in the area of health, this problem can be overcome to some extent.

E3.2.5 Firms leaving the programme at the end of Phase 1 or Phase 2 usually need to carry out further work to develop their technology. This is particularly true of the micro and small firms.

We recommend that, after projects are complete, firms should be signposted to additional sources of support, for example, to support additional development activities, product trialling or market development.

E3.2.6 The SBRI is one of a number of options, some of them complex (including EU programmes and through procurement under the Directives), that departments can use to promote any or all of the following: innovation amongst firms, meeting operational needs, addressing broader policy needs. If the scheme is to be expanded to other departments/agencies,

We recommend that training be provided to relevant departmental staff since awareness of how to operate the scheme is highly variable. Key areas where capacity is required are; at the strategic level where knowledge of how to use SBRI within departmental priority setting is needed as is knowledge of how to formulate challenges; and at the operational level, where greater understanding is needed by departments of how to engage with firms that are participating in SBRI competitions, particularly at Phase 2.

E4 Programme Impacts

E4.1 Main Findings

E4.1.1 The SBRI is an ambitious programme with multiple objectives that aims to support firms, improve the operation of Government departments, stimulate innovation and bring wider spillover benefits. Where a programme, such as SBRI, is only recently implemented, has a wide range of potential benefits, where outcomes depend upon innovation, and where data held by

Government about the operation of the programme is not comprehensive, there are significant limitations on what an impact assessment can conclude. We observe that the full business, economy and societal impacts of SBRI are yet to emerge fully. From application to the award of a UK patent is generally around four years, which suggests that competitions funded in 2009 when the SBRI was re-launched, if typical of UK patenting activity, will only now be generating formal IP. Our report is not, therefore, a definitive statement of the impacts of SBRI.

- E4.1.2 Our survey evidence on the progress of firms through the SBRI competitions during 2011 and 2012 suggests three main conclusions. First, firms generally find the Phase 1 and Phase 2 application processes helpful and constructive. Second, where support is provided, either through Phase 1 or Phase 2 funding, the vast majority of firms report achieving all or most of their objectives. Finally, relatively few SBRI funded projects (4.6 per cent in Phase 1) would have proceeded unchanged without SBRI support; a further 39 per cent proceeded without SBRI support but either reduced in scale or delayed. In operational terms the scheme therefore works well for participating firms with overwhelmingly positive company feedback and high levels of additionality in Phase 1 support. Conclusions in relation to Phase 2 support are tentative due to small respondent numbers but here too, additionality seems high. For competitions run in 2013 and 2014 it is too early to judge impact as yet, but the experience of firms applying to competitions over this period largely mirrors the positive experience of firms over the earlier 2011 to 2012 period.
- E4.1.3 Firms benefitting from SBRI are different from the general population of UK firms. SBRI applicants are generally larger and younger than the general population of firms and concentrated in the information and communication, professional, scientific and technical activities and administrative and support service activities. SBRI applicants have a much better qualified workforce than non-applicants – nearly twice as many SBRI applicants have a 50 per cent graduate workforce compared with non-applicants.
- E4.1.4 Our assessment of the impact of SBRI through competitions during 2011 and 2012 was hampered by the difficulties encountered in developing a sampling frame for the evaluation survey and the lack of data on MOD applicants and winners to their SBRI competitions. The difficulties encountered relate – in part – to the lack of any unified database of SBRI applicants and winners referred to earlier (E2.1.6). This reduced the scale of the evaluation survey and the robustness of the final evaluation results.
- E4.1.5 With these caveats, our analysis suggests that in 2014, two years after the award of the SBRI contract, Phase 1 winners estimate their sales are higher on average by £32,300, Phase 2 winners by £224,300. Our econometric analysis – matching winners with similar firms in the non-applicant population – suggests a turnover increase of around 12.7 per cent on average across the Phase 1 and Phase 2 competitions. The resulting benefit:cost ratio (BCR) estimates – reflecting the impact on scheme winners – are 1.63 where effects are self-reported and 2.40 on the basis of the econometric estimates.
- E4.1.6 We should note however that our BCR calculations reflect purely the impact of SBRI on the sales of competition winners and related spillover effects. They do not take into account any benefits in terms of departmental cost savings, service improvements or the benefits which may accrue to firms in terms of increased future sales. Furthermore, we note that as public sector efficiency benefits may have a substantial impact on the BCR, and as they are a central aim objective of SBRI, the BCR in this report should not be directly compared to those for other innovation programmes to assess relative cost-effectiveness.

E4.1.7 SBRI also generates substantial strategic added value for competition winners. For example, there is the potential for SBRI to stimulate ideas for other innovation projects. This positive spillover was experienced by 83.5 per cent of contract recipients. Around a sixth (16.6 per cent) of SBRI winners also reported that receiving SBRI support had made it easier to access additional finance in the last two years, with another 38.8 per cent of firms indicating that SBRI had made it ‘somewhat easier’ to access external finance.

E4.1.8 As we have noted above, the study team believe that any economic assessment of the programme (whether at departmental level or across the whole area of the programme’s operation) should take account of, in addition to the benefits to firms (and elsewhere in the economy when the main impact is a policy impact), the benefits of SBRI programme on departmental budgets which will mainly be in terms of efficiency and effectiveness. The extent of the savings indicated (but not demonstrated) in the review by the Office of Health Economics of the SBRI Healthcare programme suggests that the capacity of the programme to save money may be significant. But more work is needed in this area to assess the likely extent of savings. This activity should involve comparison of SBRI with alternatives in order to achieve a proper measure of the additionality of the programme.

E4.2 Recommendations

E4.2.1 SBRI generally works well both for the firms which apply unsuccessfully and for those which win competitions. In operational terms the scheme therefore seems to be effective. Levels of additionality are also high and there therefore seems little need to change the current approach to delivering the scheme. Competition winners are also achieving most or all of their project objectives from their SBRI projects. Government too is benefiting from the programme but the overview of what the programme is achieving for Government is incomplete as departments have not gathered this information systematically and therefore in a way that would support a sound measure of additionality. This raises questions about whether SBRI winners are currently deriving the maximum commercial benefit from their SBRI supported projects, and whether departments are realizing the wider benefits that flow on from their support for policy or operational challenges.

We recommend that: Departments should seek to enhance their understanding of whether and how SBRI winners maximise the commercial value from their SBRI projects. This can be accomplished by a range of activities but it will be underpinned by a system of project monitoring of challenge outputs, outcomes and impacts that does not yet exist in any real formal sense.

We recommend that: BIS conducts a further impact assessment before the end of 2018, which will allow a ten year retrospective on the programme’s operation and impact to be assessed, and in particular to provide a focus on the contribution that the programme has made to departmental efficiency and effectiveness.

1.0 Introduction

1.1 The Structure of the Report

This final report of the study team has been prepared in the summer of 2015. It follows an extensive interim report provided to and accepted by Innovate UK in February 2015. This final report has three main parts.

Part One introduces the terms of reference for the Study, and then outlines the programme, focusing on its history, its role in the policy context, its rationales, design and operation. Part 1 contains two chapters.

Part Two is the main part of the final report. It provides the findings of the study team on the three main issues identified in the terms of reference. Part two contains three chapters, a findings chapter that provides a baseline of how the programme has been operating, with perspectives from departments and from firms; this is followed by a chapter on the SBRI programme processes and how effectively they operate to deliver the programme mission; a third findings chapter then follows which outlines the impacts of the programme, as they arise for firms and the economy, and for departments specifically;

Part Three provides the conclusions and recommendations of the study.

Thirteen annexes are provided which include the following: a list of the public sector bodies that have used the programme; the SBRI competitions we have used in our analysis and any competitions excluded from the analysis; the organisations which responded to the study; details on the aims, sampling frame and conduct of the two company surveys completed as part of the SBRI evaluation; a profile of the group of firms which applied for SBRI support during the 2013-14 period based on the second of the company surveys which was undertaken to provide a baseline against which future evaluations of SBRI could be undertaken; a report of a small number of interviews undertaken by OMB Research Ltd of firms that had submitted a proposal to the Centre for Defence Enterprise (CDE) and which were users of the MOD part of the SBRI; the terms of reference for the study as they appeared in the Invitation to Tender document; the technology readiness level (TRL) framework as defined by the EU Commission; the references; the composition of the study team, including organisations and personnel; further statistical review of departmental usage of the programme; a list of tables; and a list of figures.

In addition, data gathered by the study team's survey and analysis company (OMB Research Ltd) of firms participating has been stored and is held securely and anonymously.

Part One – Terms of Reference and Programme Overview

2.0 The SBRI Programme

2.1 The Terms of Reference

The terms of reference for the study were to conduct an evaluation of the UK Small Business Research Initiative and to seek answers to the following three main questions:

- (1) to draw up a baseline of SBRI programme use and thereby to understand the effect of the announcement of new departmental targets announced in the Spending Review 2013 upon the use of the programme by departments and other public sector bodies;
- (2) to conduct a thorough review and investigation of the SBRI process by which the programme realises its mission and achieves its impacts, including an assessment of the capability of government departments to operate the programme;
- (3) to conduct a detailed review of the impacts achieved by the programme.

Competitive R&D procurement in stages by public sector organisations (pre-commercial procurement (PCP) as it is widely referred to in Europe) is an increasingly important approach that governments are taking to encourage innovation and stimulate the economy while at the same time meeting other more specific operational and policy goals. Such programmes exhibit considerable variety (1), and further changes to the legal contexts in which procurement takes place are probable and may make this approach more widespread. Despite these changes, it is appropriate that as the UK government departments are given greater incentives to use the SBRI following the Spending Review (2) an evaluation of the programme is carried out to provide a baseline against which the programme can be judged in the future. This will help government to understand how the programme is operating, how it has been implemented, and what it has achieved.

We were not asked to investigate the legal aspects of the programme, such as the consistency of the programme with national and EU legislation on procurement and state aids, or the effect of R&D tax credits on participating and applicant firms. However, such issues do affect all three major aspects of the programme we have been asked to investigate (the setting of targets, the design and operation of the programme, and the programme's impact) and where these legal issues have emerged during our investigation, we have highlighted them and briefly discuss them.

2.2 Review of Programme: History, Rationale and Logic

2.2.1 History of SBRI

The UK Government's Small Business Research Initiative (SBRI) programme is one of a number of pre-commercial procurement programmes (PCP) that have been developed internationally (3) and which are based on the US Government's Small Business Innovation Research (SBIR) programme introduced in 1982. The UK's SBRI programme, in common with other PCP programmes, aims to provide a lead customer for technological (product or service) innovation by means of a normally two-stage competitive process in which firms seek to demonstrate the scientific, technical and commercial feasibility of their product or service idea and, at the second stage, to develop a prototype. Specifically, the SBRI seeks to engage with industry to define and meet (a) government's operational requirements for innovation or (b) the need for more general innovations to address specific policy problems where the government will not itself be a purchaser of the innovation but where the market, left to itself, might not be expected to deliver solutions (i.e. where market failure occurs). At the end of the SBRI process, innovations have

been developed to the point where volume production is the next step and market competition can take place.

The UK programme was introduced in 2001 and re-launched in 2009 (4) when the Technology Strategy Board (now Innovate UK) took responsibility for it. The UK's SBRI is one of the two main EU Member State PCP programmes operating in Europe, but there are increasing numbers of PCP programmes or variants of the concept under development in Europe and around the world. In the Netherlands there are in fact three variants of the SBIR programme: the SBRI programme run on behalf of government departments by AgNL, the Dutch innovation agency which is linked to the Ministry of Economics; the STW Valorization Grant, which is a grants scheme but which involves some R&D competitions in stages; and the TNO-SBIR programme. It is the AgNL programme that is closest to the US SBIR and to the UK's SBRI, although there are features in the other programmes with similarities to the US and UK programmes.

Within the UK, the Department of Health, with assistance from Innovate UK, operates an SBRI which is managed by Health Enterprise East through the NHS England initiative and which is supported by the Academic Health Science Networks (AHSNs). The UK's Ministry of Defence also operates the SBRI programme through its Centre for Defence Enterprise (CDE) located in the Defence Science and Technology Laboratory (DSTL), the retained (within government) part of the former Defence Research and Evaluation Agency. MOD has a greater capacity than other departments to operate SBRI and in practice has significant operational control over how its SBRI competitions are run.

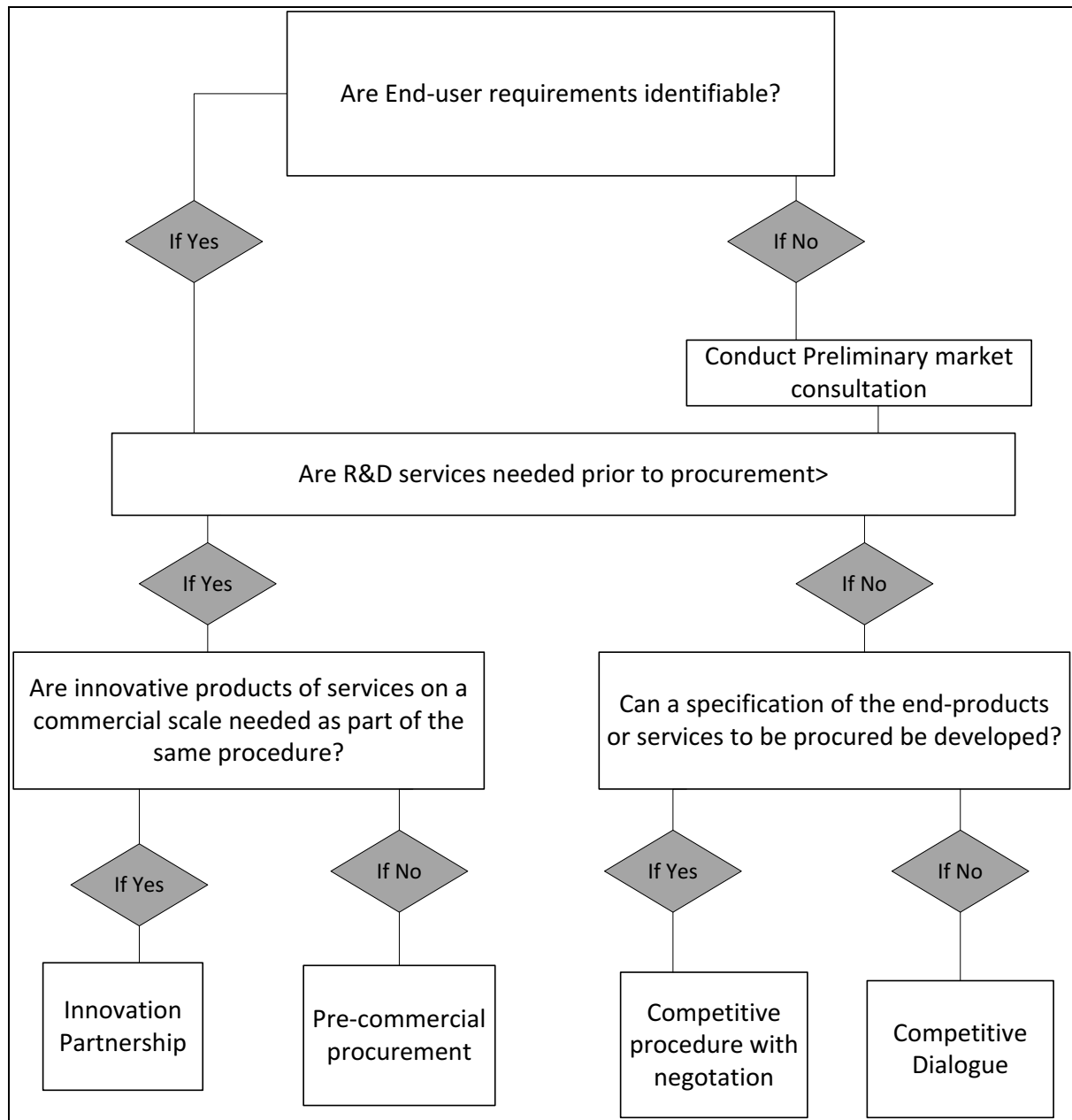
The Health SBRI is different from the Innovate UK SBRI in that it has begun to provide an optional Phase 3 for the further development of the prototype developed at the end of the Phase 2. The adoption of a third stage of support is considered to be necessary in the UK health sector context because of the high costs associated with securing adoption of technologies within the complex regulatory context of healthcare. In some competitions, all Phase 2 winners have obtained Phase 3 awards to develop their technology further, but at this stage (spring 2015) only four competitions have used a Phase 3 award. The decision to continue to use Phase 3 awards has been made in principle, but in practice, the use of Phase 3 depends upon the availability of finance (affected by the number of Phase 1 and Phase 2 firms receiving support), and the actual desirability of the outcomes of supporting technological development at Phase 3 in particular cases.

The European Commission, whose PCP Communication (5) provides one possible approach to PCP (6) but one which is compatible with the EU Treaty and the Government Procurement Agreement (GPA), has itself operated PCP through the Information Society Technologies programmes of Directorate General Connect. Furthermore, the new procurement directives planned for introduction in Member States in 2015 will now contain a procedure, *the Innovation Partnerships*, which will allow procurement organisations / contracting authorities to conduct a multistage procurement process that combines pre-commercial with the actual procurement of resulting goods and services. This provision aims to make more widespread the practice of innovative procurement and could potentially have implications for public procurement of innovation, and those programmes such as the UK SBRI which have been established as means of facilitating procurement of innovation. The proposals for the new directive outline a way in which the market-based procurement can be coupled to the earlier prototyping and development phases (7). A useful outline of the new procedures and how they can be implemented within the context of the procurement of innovation is Semple (8). An annex containing advice from the European Commission on the procedure has been provided to the study team from Innovate UK (9). The UK Government (10) considers the new proposals generally to be in the interest of the UK economy and government, and has sought implementation earlier than the European Union's own deadline for transposition. This will then make available to departments and to Innovate UK the new innovation

partnerships procedure that allows departments to conduct a procurement of R&D and the resulting end-product / service in a single competition.

While this new procedure has some additional flexibility over and above the SBRI programme, two points should be noted that concern its operation, and which may prevent it from being widely used: a) the limited scope of application of the procedure, b) the risk of having to abandon the use of the procedure mid-competition when a new potential supplier is identified. These restrictions on the use of *innovation partnerships* arise because the procedure has been drawn up to ensure comprehensive compliance with the State Aid framework of the EU. As regards the scope of the innovation partnerships, the framework potentially limits the use of the procedure to situations where the public procurer is the sole purchaser of the product, and the product so unique that at the end of the R&D stage, there is not likely to be any benefit from opening the process to further competition. Regarding the need to stop the procedure mid-competition, if, during the procedure, just one supplier is identified on the world market that would be sufficient to prevent (foreclose) competition, and stop the process.

Figure 1 Choice of Procurement Procedure under New Procurement Directive



(Source: Semple, 2013 with permission of the author)

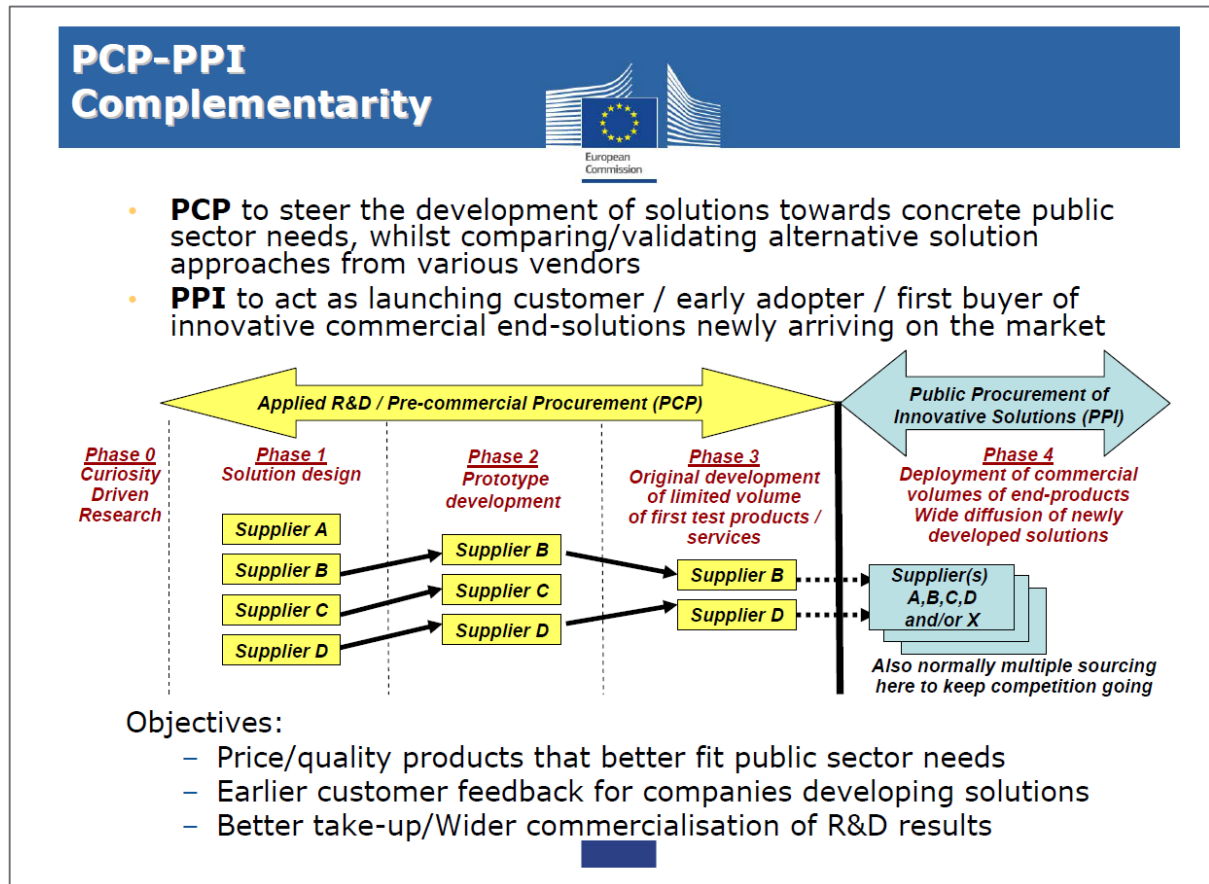
PCP schemes around the world (including within Europe) exhibit considerable variety (1), and further changes to the legal contexts in which procurement takes place are probable. Despite this uncertainty, PCP schemes are currently a key element of approaches to the promotion of innovation, and the UK government appears to be ready to require departments to increase their use of SBRI following the Spending Review (2). It would appear to be particularly important to stimulate R&D in a period of declining private expenditure (see for example Connell (11) quoted in Gordon (12)).

2.2.2 Frameworks for the Policy

The SBRI programme is considered to be a policy mechanism that supports technological development along a sequence of steps which ends with the commercial (i.e. on the market) availability of a product or service. This sequence of steps of the programme can be readily mapped to part of a *Procurement of*

Innovation Framework, used extensively by the European Union. The European Union defines its PCP activities in relation to this framework; see Figure 2 Phases of Procurement, EU Reference Document.

Figure 2 Phases of Procurement, EU Reference Document

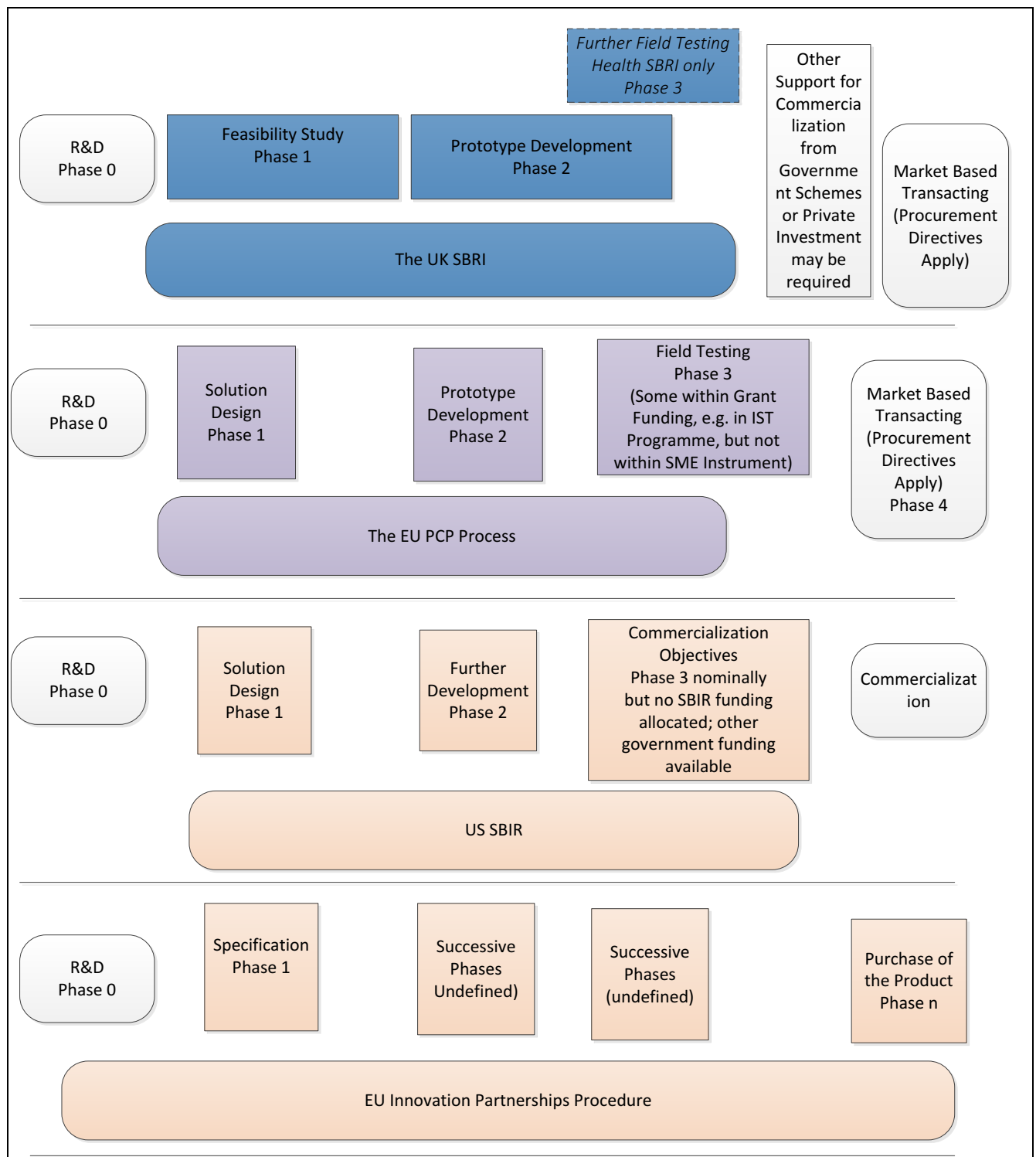


(Source: Based on EU Commission, DG Connect, *Public Demand Driven Innovation, PCP and PPI in Horizon 2020*, Lieve Bos, European Commission, DG Connect (Communication Networks))

The main purpose of the procurement framework is to identify at what stage market competition should occur, and therefore at what stage the Government Procurement Agreement applies. The phases figure shows pre-commercial procurement (PCP), of which the SBRI programme is an example, is the first part of what is seen by many as a two part process that constitutes the procurement of innovation or (PPI), although in the EU figure, the term PPI is used to refer only to the second stage. The public sector's desire for innovation may not always require a pre-commercial stage, as existing procedures that govern it are intended to facilitate innovation. However, as many have pointed out, achieving innovation at the second stage – PPI – is challenging, there being many barriers to innovation within procurement (13).

There is an important difference between the UK and EU programmes. In the next figure, Figure 2 Phases of Procurement, EU Reference Document, the UK, EU and US approaches are shown together. It can be seen that the UK scheme's two phases cover the same activities as are covered in the EU's three phases, and reach also into the area of activity where the US scheme supports commercialization. In principle therefore, the UK scheme aims to do more within its two phases than might be achieved in the other schemes. However, given the variety of approaches within the EU and within the US, it is difficult to make simple comparisons between the schemes.

Figure 3 UK Approaches to PCP compared with the EU and the US



(Source: EU Horizon 2020 Workplan, UK SBRI staff, US SBIR)

It should also be noted that within the EU, pre-commercial procurement is supported under the Community’s main R&D programme (currently in 2015 Horizon 2020), where grants are used to support companies, as well as being a procedural framework within which *contract based* pre-commercial procurement can take place. In the Horizon 2020 (and within the previous Framework Programme

under the Information Society Technologies Programme), a similar set of stages is used. Within the EU support system, there is a Phase 3 support of project which has been offered through the IST programme, however, direct financial support is not provided within the SME part of the current Framework Programme (H2020).

The Relevance of the TRL Framework to SBRI Operation

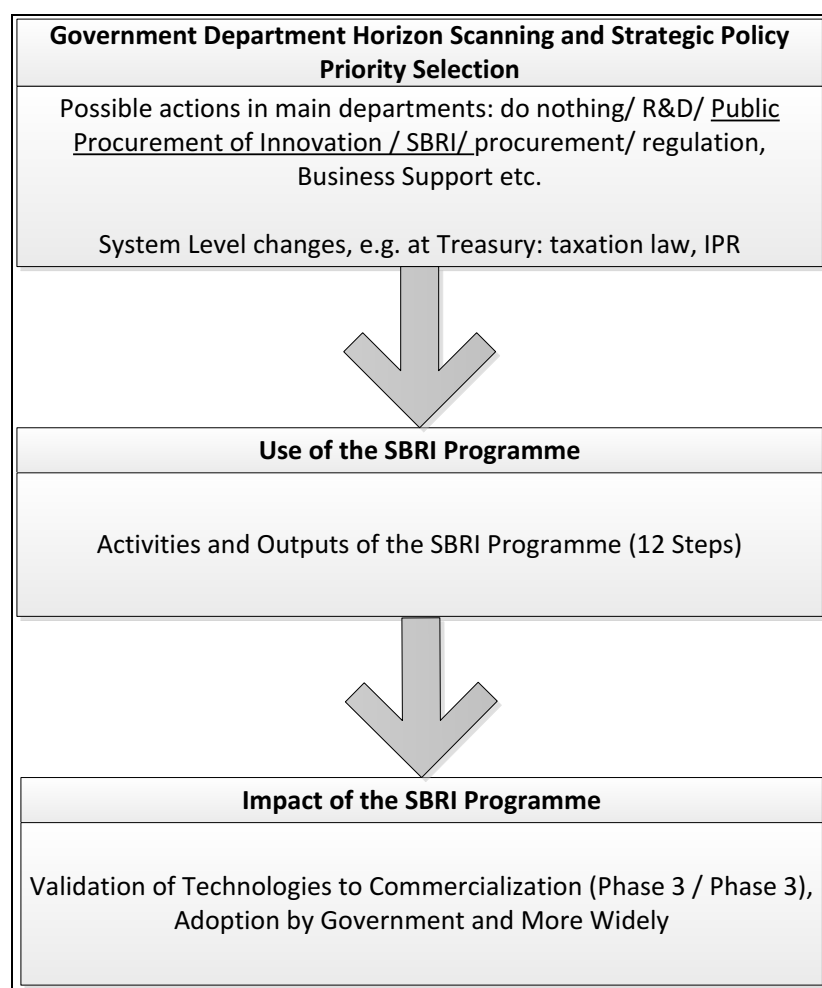
The Technology Readiness Level (TRL) framework, which varies in its implementation around the world, is often used by firms, governments and other high technology users or developers to assess the maturity of a state of a technology (14, 15). In the US, the SBIR has been seen by some of the departments that operate it as seeking to support technology development through certain specific technology readiness levels. However US Department of Health does not employ TRL (16), and the use of TRL levels across the US is not always consistent. While the UK government and the EU Commission make use of TRL levels, (5) – see Box 2 TRL Levels as Defined by EU Commission), the TRL level framework is not used by Innovate UK specifically to define the activities supported by the SBRI, although very occasionally some promotional material has suggested that it does. Innovate UK does not routinely employ TRL framework because the SBRI innovation concept is an integrating one, and the outcomes of the SBRI process may involve the combination of technologies from a variety of TRL levels. Of greater use in this context of the UK SBRI programme is the System Readiness Level concept, which assumes that in the context of the UK's challenge based approach to innovation supported by government, innovation usually involves the bringing together of technologies from a variety of TRL levels. The programme management of the SBRI therefore does not consider that the programme involves the linear development of one single technology from research and development stage ultimately to the point of commercial availability.

2.2.4 Programme Rationale and Logic

The following section outlines how Innovate UK believes the SBRI programme fits into government policy making and solution selection, and how its activities lead to outputs. We provide two visual aids to make this clear: an initial context setting diagram that sets the SBRI within the overall context of policy making, and a second table that maps a logic chart approach to the actual Steps of the SBRI programme.

In the figure (Figure 4 SBRI in Context) the SBRI is the middle box. It is the policy chosen when government decides to deal with its strategic policy priorities through the procurement of innovation through SBRI, rather than by way of other policy levers which may be at its disposal in dealing with its policy priorities. The figure shows that impacts occur after the programme.

Figure 4 SBRI in Context



(Source: Discussion with Innovate UK)

In the table which follows (Figure 5 Mapping Programme Logic), the rationales and steps by which the programme operates are outlined. The departmental rationale for the programme is identified, as are the rationales for the use of the SBRI programme, which are the realization of improvements in departmental effectiveness and support to firms which participate in the programme (leading to economic growth). The programme’s activities are then outlined as are the outputs and outcomes which come later in the process. Some steps contain more than one activity (such as Step 1) and some Steps of the programme include both activities and outputs or outcomes. Step 12 of the SBRI is where impacts arise. However, in principle, impacts will only arise after the programme completes and possibly although not necessarily as a result of other government interventions that allow technologies to be further developed to the point where they are commercially available.

Figure 5 Mapping Programme Logic and Programme Steps

Start of SBRI Process	SBRI Steps	Description
Rationales - Departmental	Departmental Policy Objectives	
Rationales - Programme	Support of Public Service Effectiveness and Efficiency	
Rationales - Programme	Promotion of Economic Growth	
Activities	Step 1 Initiate Project	Sector Knowledge applied by specialists (IUK or departmental/ PSB, e.g. CDE, Health SBRI / AHSNs)
Activities		Formulate challenge area: develop performance based specification
Activities		Decision on use of Phases (P1 only, P2 only, P1 + P2)
Activities	Step 2 Define Scope	Defining Limits to Procurement: technologies, sectors, timescale, costs
Activities	Step 3 Prepare Competition	Development of Competition(s) Plan: Project Brief (Doc. 002), Guidance (Doc. 003), Application (Doc. 004) Role of Department in conduct of procurement agreed (Step 2.2)
Activities	Step 4 Launch Competition	Competition Launch (Pre-launch and Launch, Promotion and re-Promotion)
Activities		Firms Aware
Activities		Firms Apply Phase 1
Activities	Step 5 Process Applications	Applications Assessed
Activities	Step 6 Select Winners	Selection of Phase 1 Winners
Activities		Contracts Awarded Y/N
Activities		Feedback to unsuccessful apps.
Activities	Step 7 Phase 1 Execution	Firms Undertake Phase 1 Work
Output		Firms Report at end of Phase 1
Outcomes/ Impacts		Possible commercial outputs from Firms that exit SBRI at end of Phase 1
Activities	Step 8 Prepare for Phase 2 Assessment	Design of Phase 2 Process
Activities		Firms Apply Phase 2
Activities	Step 9 Process Applications	Process and Review Applications
Activities	Step 10 Select Winners	Selection of Phase 2 Winners
Activities		Contracts Awarded Y/N
Activities	Step 11 Phase 2 Execution	Firms Undertake Phase 2 Work
Outputs		Firms Report at end of Phase 2
Outcomes and Impacts	Step 12 Open Procurement	Product or Service Developed to Phases 3 and 4
Outcomes and Impacts		Procurement of Goods or Service by Government / PSB / Private Purchaser

(Source: Innovate UK)

Aims, Rationales and Emphasis

The following table identifies (column 3) the aims and rationales of the UK SBRI and compares the UK programme with the two other most developed examples of this type.

Table 1 The UK SBRI and other Programme Types

<i>Aims and Rationales and Emphases</i>	<i>Programmes</i>		
	<i>US SBIR</i>	<i>UK SBRI</i>	<i>NL SBIR</i>
Risk	<i>Explicit</i>	Explicit	<i>Implicit</i>
R&D funding gap (public good)	<i>Explicit</i>	Explicit	<i>Explicit</i>
Support of small firms	<i>Explicit and required under US Federal Law</i>	Implicit and encouraged (but not legally possible under the Treaty on the Functioning of the European Union)	<i>Implicit (but not legally possible under the Treaty on the Functioning of the European Union)</i>
Improvement of Public Services	<i>Explicit</i>	Explicit (although programme operates on both policy and operational levels)	<i>Not explicit – many services which are supported are privately operated</i>
Information Asymmetries	<i>Explicit</i>	Explicit	<i>None</i>
Signalling effect to the market for venture capital	<i>Explicit</i>	Implicit	<i>Implicit but not express</i>
Engagement with Minorities	<i>Explicit</i>	None	<i>None</i>
Supply / Demand Emphasis	<i>Demand pull but with emphasis on specific technologies rather than solutions (often supporting at earlier TRL levels) Technology Push</i>	Demand Pull	<i>Demand Pull</i>
Small firm creation	<i>Implicit</i>	None	<i>None</i>

(Source: study team)

The agency which has taken responsibility for operating the SBRI programme since 2009 and implementing and ensuring its spread across other government departments is Innovate UK, formerly the Technology Strategy Board, the UK's innovation agency. The SBRI programme was launched in 2001 but did not realize the objectives envisaged for it (17), and in 2008 and 2009, the SBRI was relaunched under the guidance of Innovate UK (the Technology Strategy Board as it then was). SBRI fits into the framework of support activities which the UK government provides for technology development by firms and research organisations and it supports technological development through funding 100% of the cost of a feasibility study for a particular technology in the Phase 1 part of the programme and the cost of development of a prototype in the Phase 2 part of the programme. The programme provides part of what is termed “the route to market” for small innovative firms.

The UK programme has two main objectives: a) supporting Government departments in finding solutions to their own policy / operational needs where current solutions are inadequate or don't exist, and b) to support technological development amongst firms. Government policy objectives can include the development of technology for private users where there is a public policy rationale. To the extent that the programme attempts to define through an SBRI procurement (of R&D services) how a need may be met, the SBRI is an example of a so-called *demand side measure*.

The emphasis of the SBRI is upon meeting the needs of government through novelty and the issue of a challenge to industry rather than simply the development of technology in itself. The US SBIR by

contrast is a mandated scheme where departments are legally obliged to meet their targets for use and there are sanctions if such targets are missed. In emphasising the needs of UK government departments (at an operational level or in terms of policy objectives) rather than technology outcomes, the UK programme may reduce the risk that departments will develop challenges that favour a particular technology or company, perhaps one based in the UK or some other favoured country. In practice, this risk, that the challenges will favour particular technologies or businesses, is likely to be small as the procurement requirement is formulated within the UK approach in terms of an organisational or policy need. The creation of new firms (part of entrepreneurship policy) is not explicitly part of US, UK or the Netherlands' policy aims for SBIR/SBRI although there is some evidence emerging based on studies of the US that new firm creation may be an outcome of the programme there (18)

2.2.4 The SBRI Process

The main steps of an SBRI process are described in the document (19) and comprise 12 groups of activities. The last phase is the procurement of the technology developed within the R&D competition under the procurement directives. As Step 12 is in fact conducted under a different legal and institutional framework from the SBRI, it is therefore outside the SBRI. We nevertheless discuss this stage of the procurement process as it is the desired outcome of the SBRI.

The steps which are outlined in the Logic Chart (Figure 5 Mapping Programme Logic) are as follows Box 1: SBRI Top Level Process and are labelled as they appear in Innovate UK's own process model.

Box 1: SBRI Top Level Process

- Step 1 Initiate Project
- Step 2 Define Scope
- Step 3 Prepare Competition
- Step 4 Launch Competition
- Step 5 Process Applications
- Step 6 Select Winners
- Step 7 Phase 1 Execution
- Step 8 Prepare for Phase 2 Assessment
- Step 9 Process Applications
- Step 10 Select Winners
- Step 11 Phase 2 Execution
- Step 12 Open Procurement

(Source: UK (20))

General Observations

A number of observations can be made about the process. The Steps (each of which includes a number of sub-steps or sub-parts) capture many of the important activities involved in a competitive R&D procurement in stages but not all: for example funding is not a step as such. The steps are presented within the Innovate UK model as a sequence mostly without feedback or iteration between them. Some iteration is noted in regard to the specifications and challenges results which are intended to result from consultations which are bilateral, and the Phase 2 competition and interviewing process also involve iteration. At Step 1, the decision to develop a challenge is one that depends upon a large range of actors, and may include Innovate UK technologists working with or independently of departments.

There are three significant aspects of the SBRI process:

- a) origination of the challenge;
- b) funding of the competition(s);
- c) administration of the competition(s).

In practice, Innovate UK and departments work together at these three main levels of activity: development of challenges; administration of the procurement; and funding of the competitions. The involvement of Innovate UK in the SBRI process varies with some SBRI procurements occurring without major involvement of Innovate UK while others involve Innovate UK significantly. The figure (Figure 5 Mapping Programme Logic) describes the SBRI process in detail and outlines the main activities that occur and the outputs, outcomes and impacts that may result.

Departmental allocations of staff to the work of SBRI fall into two main categories: the SBRI contact or Champion who is normally based in either procurement or an innovation function; the SBRI challenge user, who may be responsible for the origination of the challenge within the department and who can specify the need/challenge to which the technology is a solution. Currently, no ministerial portfolio includes explicit reference to responsibility for the SBRI programme.

Innovate UK involvement with departments occurs for two reasons: a) where Innovate UK is trying to help a department to develop its expertise with SBRI (and is perhaps a newcomer to the programme) and Innovate UK therefore helps departments overcome any initial risk aversion. This money comes from a dedicated co-funding “pot”; b) where there is overlap between what the department wishes to do and one of the Innovate UK SBRI challenge activities.

While the SBRI is a sequence, it is possible for some of the steps to be omitted in the following cases:

- a. procurement may begin at Phase 2 instead of Phase 1 if the available technology is already demonstrated to be feasible and when only a prototype is required;
- b. procurement ends at the end of Phase 1 as there the research shows it is not possible to demonstrate feasibility with the technology;
- c. procurement may progress more quickly in the first phase, with the effect that at the end of Phase 1 the technology reaches the prototype stage with no requirement therefore for support during Phase 2. At that point a Phase 3 activity would take place to develop the technology further towards commercialization.

The Sequence

The SBRI process chart and list of Steps combines different types of programme and policy entities: rationales, objectives, activities, outputs and outcomes. In the Logic and Process Chart we have prepared, each step is labelled appropriately.

At the initiation stage, departments or Innovate UK consider the SBRI as an option (one of a number of policy approaches, including regulation, research and development) which can be used to help them deal with their departmental policy and operational needs. In the event that those needs suggest that an SBRI approach might be the best way of meeting the need, the decision is taken to express that need in the form of a challenge (either an operational or policy challenge) and a challenge area is then defined and challenge formulated. Innovate UK may assist with the process. The next element of Step 1 (the Initiation of the Project) begins with the development of a performance-based specification. At the same time, the decision is taken over how to structure the SBRI competition, and whether to run a Phase 1 only

competition, a Phase 2 only competition or to use the full stage process, depending upon an assessment of the stage of the available technologies on offer.

It is in respect of challenge development that Innovate UK has currently the most important role to play in that it has far greater understanding of what an SBRI is meant to achieve, and far more experience than most departments in defining challenges and undertaking the administration of the competitions. For this reason, Innovate UK reviews all challenges and decisions departments make to use SBRI. While Innovate UK does not have the right to veto individual department plans to use SBRI for procurement, by virtue of Innovate UK's right to designate a challenge as an SBRI or not, it can in practice decide whether a scheme is an SBRI or not, and therefore whether it is "badged" as such and the resources used are reported to Government as SBRI money.

Phase 1 contracts are normally between £50,000 and £100,000 and the competition would take 6 months for the feasibility study to be conducted by the firms. The time taken from the submission of the application to award of a Phase 1 contract is up to 3 months but is usually less. In the case of the UK programme, phase length is flexible at both Phase 1 and Phase 2.

While the outputs of SBRI competitions will normally occur at Phase 1 and Phase 2 in the form of the reports, IP and prototypes (at the end of Phase 2 usually), impact – in the form of commercialization – would not occur until some significant period has elapsed. On the assumption that a competition takes the time normally expected for a Phase 1 period and Phase 2 period, and that the formulation period for the challenge takes around 3 months and the administration stage for Phase 2 no longer than 3 months, the time from the start of a process of challenge development to commercialization would take four years. If a patent application was made at the end of the first year of a Phase 2 award, on the assumption that the time to grant was 3.5 years (21), the time from the start of the process of challenge development to the award of a patent would be around 7 years. Thus challenges beginning in 2014 would not lead to a patent until 2021.

Departmental capability to originate a challenge, administer and finance it varies. Two departments, MOD and DH/ NHS have developed their own in house capability; this does not yet however make either completely self-sufficient in any of these respects for all types of challenge. MOD SBRI activities are mostly operated through the MOD Centre for Defence Enterprise. All the NHS England competitions are run through EAHSN and HEE but not all the DH ones and there is an NHS in each of the devolved administrations also which, if they run SBRI, they do themselves.

The steps 2 to 7 inclusive cover the first Phase (Phase 1) of the SBRI competition process. Prior to step 1 and step 2 a decision must be taken to use the competitive R&D in phases approach, rather than some other procurement activity, such as procurement under the directives, or an R&D procurement under Article 16f. While there are alternatives for departments to realize their objectives, there are also alternatives for firms seeking to develop technology. The SBRI is one alternative mode of support for this activity; but firms may also choose to apply to Smart or to other R&D funding schemes (for example the SME window of Horizon 2020).

Steps 8 to 11 comprise Phase 2 of the competition. At this stage larger amounts of money are available for firms whose bids are considered worthy of funding. Phase 2 may last up to two years. The amount that can be allocated to individual firms within the Phase 2 competition lies between £250k and £1m. However, there are no hard limits. Innovate UK indicates that this range is typical but there have been contracts that are larger, as well as some that are below £250k.

The timeline shown below comprises two main development phases – Phase 1 and Phase 2 – lasting normally six months and two years respectively. However, around these two competition periods are

preparatory or administrative periods (Steps 1-7, and Steps 8-10). The length of these periods depends upon a number of factors. It would be important for the success of competitions if these preparatory periods were kept to the minimum to ensure that the firms' plans to develop technology are not unduly delayed. The period covered by Steps 8-10 is particularly important to keep short as firms are within the process, having committed resources. It is at Phase 2 that departments are more involved in the administration of the competition. Innovate UK does not systematically monitor these periods, although the data has been collected which would allow a retrospective evaluation.

Table 2 SBRI General Timeline

SBRI Step	Year																							
	1				2				3				4				5							
	Month																							
	1	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60			
1- 6	X	X	X																					
7 (Phase 1)				X	X																			
8 – 10						X																		
11 (Phase 2)							X	X	X	X	X	X	X	X										
12															X	X	X	X	X					

(Source: Innovate UK Top Level Process for Step 7 (Phase 1) and Step 11 (Phase 2))

Beyond Step 12, technologies must be further developed. In the UK, a Phase 3 stage exists which may be used to further develop technologies in the case of the Health Service context, but it is expected that for the rest of the SBRI programme that once technologies have been developed to Phase 2, many are on the point of being commercially available. Some however will not be and, for those, other types of assistance for firms may be available. In the case of the EU PCP approach, a Phase 3 process is still required (see the EU Commission diagram) (Figure 3 UK Approaches to PCP compared with the EU and the US) before procurement under the procurement directives (Phase 4) of a commercially available product.

Costs of Operation

The costs of operation of the programme are in three forms: the contracts given to firms; administrative costs comprising those of the staff / Innovate UK; and costs of staff engaged with the SBRI at departments. Administration costs are an issue of interest in the US programme and an attempt has been made to investigate these (22). The GAO has reported that in the case of the US SBIR, “costs cannot be determined because the agencies do not identify or track all costs” (22 page 23). They do not track costs because the “neither the authorizing legislation for the programs nor the SBA guidance directs agencies to track and estimate all administrative costs, and neither the law nor SBA guidance defines these administrative costs” (also page 23). Furthermore, the GAO report also notes that a further reason why administrative costs have not been tracked is that the use of programme funds to fund salaries (for both the SBIR and the STTR) has been prohibited. However, some information has been collected by some departments prior to the implementation of new procedures that allow up to 3% of SBIR programme funds for certain administrative costs and this is given in an Annex to the GAO report.

The UK programme was established without specific recommendations for how much the programme would cost to operate and the study team believes that no special budget for staff time exists within departments for the use of the programme with the exception of Innovate UK which has a mechanism for assessing staff time allocated to SBRI activities.

Staff time spent on operating the programme is likely to be higher during the first years of operation as staff in departments acquire and develop the expertise to operate it. However, without regular use of the programme, such capacities may decline. Furthermore, the programme is complex, hence the need for the specialist help of Innovate UK, and although the scheme has been documented and procedures detailed, there are many aspects that cannot be written down and must be learned through practice.

Part Two – Presentation of Findings

3.0 Findings: Programme Baseline: Use of the Programme; Target Setting Process; Data Collection and Management

3.1 Introduction

This chapter is concerned with setting a baseline on how the programme is used. It examines programme use from two vantage points: of departments and firms. The chapter then examines the target setting process, which is an important part of the programme's recent development. We seek to determine if there is evidence that targets have had an impact upon the way the programme has operated. Finally, we consider the data that is created by the SBRI programme itself in the course of its operation. We examine the purposes for which the data has been collected and any shortcomings in what data are collected in terms of extent, coverage and reliability. This information together provides an assessment of the operation of the programme since 2008.

The initial expectation of the study team was that data provided by departments about programme use on the one hand and about the participation of firms on the other could be cross referenced to ensure the validity of conclusions. As the data about the demographics of firms is unreliable as to location and type of firm, and is also incomplete, it has not been possible to cross-reference. We present, nevertheless, two baselines of programme operation, one focused upon the use of the programme by public sector bodies, the other on the use of the programme by firms.

3.2 Review of Programme Use – A Baseline of Departmental Usage

3.2.1 Overview

The study team conducted an analysis of individual SBRI competitions which were provided to it by Innovate UK in the form of a large spreadsheet. The data from July 2014 (period October 2008-July 2014) was used for analysis. The data was used to build up a picture of the operation of the programme. The data obtained through the analysis of this material was to be used mainly for Objective 2 of the evaluation, but also for Objective 1.

Periods covered:

Descriptive statistics based on the Innovate UK Management Data cover the following periods (We consider the ***opening month of first phase***):

- October 2008 – August 2010
- September 2010 – September 2012
- October 2012 – July 2014

Departments/competitions covered:

- 17 departments in total;
- 6 user departments with target: Department of Energy and Climate Change (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);
- 4 major user agencies without target: Devolved Administrations (treated as one group), The Department of Business, Innovation and Skills (BIS), The National Centre for the Replacement,

Refinement and Reduction of Animals in Research (NC3Rs), Innovate UK (NC3Rs and Innovate UK belong to BIS family); by ‘major’ we mean the size of usage is significant.

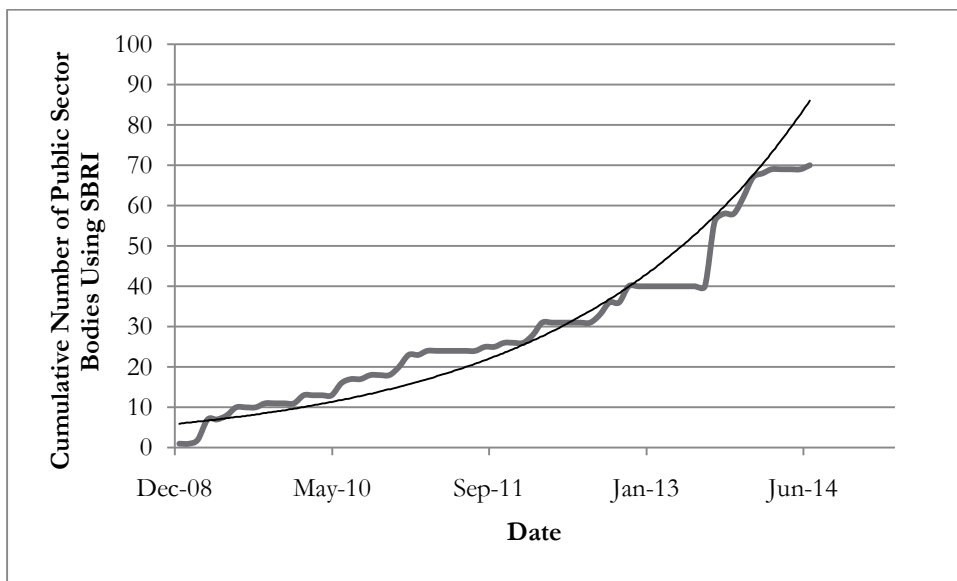
- 6 others: The Department for Work and Pensions (DWP), The Food Standards Agency (FSA), Ordnance Survey (OS), The UK Space Agency (UKSA), Research Councils (RCs), the Intellectual Property Office (IPO), (IPO, RCs, UKSA belong to BIS family) that may represent important future users of the programme in the view of Innovate UK;
- 4 other competitions not considered as belonging to any department because they were partially funded by European Commission; but they were used for cumulative calculations: SBRI_HA_148, SBRI_HA_215, SBRI_PCP_139, SBRI_PCP_142.

It should be noted that the earliest competitions date back to October 2008. In cumulative analysis however, the starting point was selected as December 2008 owing to data availability.

Total number of competitions launched during this period was **195**; total number of competitions which awarded contracts by the time of analysis was **186**. The period is one of 67 months and therefore there has been during this period an average of three competitions launched per month.

The following figure illustrates the trend of involvement of public sector bodies (PSBs) in the SBRI programme. By July 2014 there have been 70 PSBs participating (see Annex 1 for the list of PSBs). There was a strong increase in the number of participating PSBs in August 2013, mainly owing to the uptake of agencies within the Academic Health Science Networks (AHSNs).

Figure 6 Cumulative Public-sector bodies (PSBs) engaged December 2008 – July 2014



(Source: Innovate UK Management Data)

3.2.2 Analysis of Departments (all periods: October 2008 – July 2014)

The following table gives an overview of all the competitions launched during October 2008 – July 2014 by each user department.

Table 3 Overview of competitions launched by user departments

Department	Number of competitions launched	Total number of contracts awarded	Total value of contracts awarded (£k)	Total Innovate UK co-fund (£k)
Innovate UK	15	485	£58,448	NA
MOD	78	678	£44,758	£9,494
DECC	7	122	£31,889	£946
NHS	23	138	£31,526	£3,061
DH	9	76	£15,555	£500
NC3Rs	15	40	£13,129	£4,008
Other	7	41	£8,490	£2,400
HO	12	64	£7,821	£1,268
BIS	5	55	£5,296	£2,497
DEFRA	11	73	£4,088	£934
DAs	9	62	£3,656	£1,167
DfT	4	32	£1,651	£100
Total	195	1866	£226,307	£26,374

(Source: Innovate UK Management Data)

Note:

During this period the total number of launched competitions by these departments was 195 excluding PCP competitions. Departments are sorted according to size of use.

During the period of October 2008 – July 2014, the major user departments (including MOD) in total had awarded 1866 contracts to the value of c. £226.3m on SBRI. Innovate UK has been the biggest user of SBRI programme, having launched 15 competitions, awarded 485 contracts with a value of c. £58.5m. In terms of number of competitions, MOD has been the most active of the departments with 78 competitions launched in total.

Turning to Innovate UK co-funding, we found that MOD has enjoyed the highest contribution of £9,494, while DECC and DH, despite their large investment in SBRI, enjoyed relatively very low contribution from Innovate UK.

Table 4 Count and phase of competitions run by various departments October 2008 – July 2014

Department	P1 only	P2 only	Two-phase	Total
MOD	53	1	24	78
NHS	4	0	19	23
Innovate UK	0	2	13	15
NC3Rs	0	6	9	15
HO	1	1	10	12
DEFRA	4	0	7	11
DAs	1	2	6	9
DH	0	0	9	9
DECC	1	0	6	7
Other	3	2	2	7
BIS	0	0	5	5
DfT	0	1	3	4
Total	67	15	113	195

(Source: Innovate UK Management Data)

Note:

During this period the total number of competitions launched by these departments was 195 excluding PCP competitions. Departments are sorted according to total number of competitions.

The table above gives an overview of the nature of competitions launched by each department. In total, the user departments launched 67 Phase 1 only competitions (P1 only), 15 Phase 2 only competitions (P2 only), and 113 two-phase competitions. MOD has launched the largest number of competitions, accounting for 40% of all competitions launched. The majority of MOD competitions have been Phase 1 only (68%). It is worth noting that, without taking into account MOD competitions, the number of Phase 1 only competitions could have been 14 and the number of Phase 2 competitions could have been 14 as well. With the inclusion of MOD competitions, however, the number of Phase 1 only competitions is nearly 4.5 times as high as that of Phase 2 only competitions. BIS and DH have only been launching two-phase competitions, while other agencies have been experiencing mixtures of competitions with various phase characteristics.

Table 5 Phase 1 analysis – breakdown according to departments (October 2008 – July 2014)

Department	Number of competitions that awarded P1 contracts	Number of P1 applications	Number of P1 contracts awarded	Value of P1 contracts (£k)	Average value of P1 contracts (£k)	Success rate P1 (%)
MOD	70	3295	639	£38,635	£60	19%
Innovate UK	13	1094	316	£14,062	£45	29%
NHS	23	845	103	£8,863	£86	12%
DH	9	453	57	£6,076	£107	13%
HO	11	268	52	£3,924	£75	19%
NC3Rs	9	55	27	£2,738	£101	49%
Other	5	101	22	£2,236	£102	22%
DECC	7	332	88	£2,215	£25	27%
BIS	5	172	41	£2,076	£51	24%
DEFRA	11	188	59	£1,911	£32	31%
DAs	7	193	43	£1,802	£42	22%
DfT	3	192	29	£1,351	£47	15%
Total	173	7188	1476	£85,889	£58	21%

(Source: Innovate UK Management Data)

Note:

During this period the total number of launched competitions by these departments was 195 excluding PCP competitions. This table includes all competitions that awarded Phase 1 contracts, the number of which is 173.

Departments are sorted according to value of contracts.

The table above gives us a detailed picture of Phase 1 characteristics of all competitions which awarded Phase 1 contracts. MOD have been the largest Phase 1 contracts user, awarding a total number of 639 Phase 1 contracts with a value as high as £38,635k. Innovate UK and NHS, following MOD, awarded 316 and 103 Phase 1 contracts respectively.

The average value of Phase 1 contracts gives us a different picture. Contracts awarded by DH and NC3Rs have been of the highest average value, at £107k and £101k respectively. Average value of DECC's Phase 1 contracts have been much lower, at £25k.

Success rates of Phase 1 competitions launched by different departments differed significantly. While success rate for NC3Rs competitions has been as high as 49%, healthcare (including both DH and NHS) competition applicants have had a success rate of as low as 12-13%. The average success rate for all competitions has been 21%.

Table 6 Phase 2 analysis – breakdown according to departments (October 2008 – July 2014)

Department	Number of competitions that awarded P2 contracts	Number of P2 applications	Number of P2 contracts awarded	Value of P2 contracts (£k)	Average value of P2 contracts (£k)	Success rate P2 (%)
Innovate UK	10	371	169	£44,386	£263	46%
DECC	6	82	34	£29,674	£873	41%
NHS	14	72	35	£22,662	£647	49%
NC3Rs	15	66	13	£10,391	£799	20%
DH	7	34	19	£9,479	£499	56%
Other	4	145	19	£6,255	£329	13%
MOD	14	152	38	£5,924	£156	25%
HO	8	76	12	£3,897	£325	16%
BIS	5	40	14	£3,220	£230	35%
DEFRA	5	33	14	£2,177	£156	42%
DAs	6	144	19	£1,854	£98	13%
DfT	1	19	3	£300	£100	16%
Total	95	1234	389	£140,219	£360	32%

(Source: Innovate UK Management Data)

Note:

During this period the total number of launched competitions by these departments was 195 excluding PCP competitions. This table includes all competitions that awarded P2 contracts, the number of which is 95.

Departments are sorted according to value of contracts.

The table above looks at characteristics of Phase 2 contracts awarded by various user departments.

Innovate UK has been the largest user of Phase 2 contracts, having awarded 169 Phase 2 contracts worth a value of c. £44.4m.

In general, the average value of Phase 2 contracts has been much higher than that of Phase 1 contracts. The overall average value of Phase 1 contracts has been £58k, while the overall average value of Phase 2 contracts has been £360k. Average value of Phase 2 contracts awarded by DECC has been the highest, at £873k; average value of Phase 2 contracts awarded by DAs has been quite low, at £98k.

Phase 2 in general has had a higher success rate than Phase 1. The overall success rate of Phase 2 competitions has been 32%, while the overall success rate of Phase 1 competitions has been 21%.

Table 7 Phase 1 only Competitions (by Department) October 2008 – July 2014

Department	Number of P1 only competitions	Number of applications	Number of P1 contracts	Value of P1 contracts (£k)	Average value of P1 contracts (£k)	Average value per competition (£k)	Success rate (%)
MOD	51	2339	463	£27,751	£60	£544	20%
Other	3	77	12	£934	£78	£311	16%
HO	1	55	6	£754	£126	£754	11%
DEFRA	4	61	16	£665	£42	£166	26%
DAs	1	39	9	£648	£72	£648	23%
DECC	1	8	4	£110	£28	£110	50%
NHS	4	9	5	£100	£20	£25	56%
<u>Total</u>	<u>65</u>	<u>2588</u>	<u>515</u>	<u>£30,962</u>	<u>£60</u>	<u>£476</u>	<u>20%</u>

(Source: Innovate UK Management Data)

Note:

During this period the total number of launched competitions by these departments was 195 excluding PCP competitions. This table includes Phase 1 only competitions that awarded contracts, the number of which is 65.

Departments are sorted according to value of contracts.

'Success rate' = number of contracts awarded/ number of applications.

The table above gives an overview of Phase 1 only (P1 only) competitions launched by various departments. Among the 65 Phase 1 only competitions, 51 were launched by MOD, attracting 2339 applications and awarding 463 contracts with a total value of c. £27.8m. The other departments only launched 14 Phase 1 only competitions in total, attracting 249 applications and awarding 52 contracts with a total value of £3.2m.

Success rate varied significantly across departments, although the average success rate has been 20%, appearing the same as the success rate of Phase 1 only competitions launched by MOD. For NHS, the success rate of Phase 1 only competitions reached 56%, while for HO the rate was 11%. The main reason for NHS and DECC to have achieved such a high success rate (around 50%) was largely the fact that those competitions attracted a very small number of applications (less than 8 applications per competition).

The departments have launched quite a large number of (65 in total) Phase 1 only competitions, and quite a small number of (15 in total) Phase 2 only competitions. But the picture would look very different if MOD competitions are excluded. Without MOD competitions taken into account, the numbers of Phase 1 only competitions and Phase 2 only competitions launched by all departments have been the same (14 competitions for each category).

Table 8 P2 only Competitions (by Department) October 2008 – July 2014

Department	Number of P2 only competitions	Number of P2 applications	Number of P2 contracts	Value of P2 contracts (£k)	Average value of P2 contracts (£k)	Average value per competition (£k)	Success rate (%)
NC3Rs	6	42	5	£3,496	£699	£583	12%
Innovate UK	1	12	3	£1,234	£411	£1,234	25%
Other	2	134	13	£371	£29	£186	10%
HO	1	53	3	£326	£109	£326	6%
DfT	1	19	3	£300	£100	£300	16%
DAs	2	123	9	£207	£23	£104	7%
<u>Total</u>	<u>13</u>	<u>383</u>	<u>36</u>	<u>£5,934</u>	<u>£165</u>	<u>£456</u>	<u>9%</u>

(Source: Innovate UK Management Data)

Note:

During this period the total number of launched competitions by these departments was 195 excluding PCP competitions. This table includes P2 only competitions that awarded contracts, the number of which is 13.

Departments are sorted according to value of contracts.

'Success rate' = number of contracts awarded/ number of applications.

The table above gives an overview of Phase 2 only (P2 only) competitions which have awarded contracts by the time of analysis. As previously discussed, in total 15 Phase 2 only competitions were launched during October 2008 – July 2014, and 13 of those have awarded contracts. Six of the 13 competitions were launched by NC3Rs, with a total value of £3,496k. In terms of value of contracts, Innovate UK has been the second largest user of Phase 2 only competitions, despite the fact that there has been only 1 competition launched.

The average value of Phase 2 contracts varied significantly across departments. While Phase 2 only competitions run by NC3Rs have had an average value of £699k, the average contract values of Phase 2 only competitions run by DAs and other user departments have been fairly low (less than £30k).

Table 9 Two-phase competitions' contracts awarded (by Dept.) October 2008 – July 2014 part 1

Department	Number of two-phase competitions	Number of P1 applications	Number of P1 contracts	Value of P1 contracts (£k)	Number of P2 contracts	Value of P2 contracts (£k)	Total value of contracts (£k)
Innovate UK	13	1094	316	£14,062	166	£43,152	£57,214
DECC	6	324	84	£2,105	34	£29,674	£31,779
NHS	19	836	98	£8,763	35	£22,662	£31,426
MOD	19	956	176	£10,884	39	£6,123	£17,007
DH	9	453	57	£6,076	19	£9,479	£15,555
NC3Rs	9	55	27	£2,738	8	£6,895	£9,633
Other	2	24	10	£1,302	6	£5,884	£7,186
HO	10	213	46	£3,170	9	£3,571	£6,741
BIS	5	172	41	£2,076	14	£3,220	£5,296
DEFRA	7	127	43	£1,246	14	£2,177	£3,423
DAs	6	154	34	£1,154	10	£1,647	£2,800
DfT	3	192	29	£1,351	NA	NA	£1,351
Total	108	4600	961	£54,927	354	£134,484	£189,411

(Source: Innovate UK Management Data)

Note:

In total 113 two-phase competitions were launched; 5 competitions had not yet awarded contracts by the time of analysis (e.g. DfT had not awarded any P2 contracts yet, by the time of analysis). This table includes all two-phase competitions which awarded either Phase 1 contracts only or all planned contracts, the number of which is 108.

Departments are sorted according to value of contracts.

'Success rate' = number of contracts awarded / number of applications.

The table above forms Part 1 of the descriptive statistics of two-phase competitions which awarded contracts (either P1 contracts, or both P1 and P2 contracts). In total, 108 of the 113 launched two-phase competitions had awarded contracts by the time of analysis. Those competitions attracted 4600 Phase 1 applications, awarded a total number of 1315 contracts (Phase 1 and Phase 2), with a total value of c. £190m.

Innovate UK has been the largest user of two-phase competitions, having awarded contracts with a value of £57m. DECC and NHS have been very active in running two-phase competitions as well, with contracts awarded at a total value of c. £31.5m each.

It should be noted that many of those two-phase competitions had not awarded Phase 2 contracts yet by the time of data analysis. The total value of Phase 2 contracts could be much higher when all competitions have finished their planned phases.

Table 10 Two-phase competitions' contracts awarded (by Dept.) October 2008 – July 2014 – part 2

Department	Average value of P1 contracts (£k)	Average value of P2 contracts (£k)	Average value per competition (£k)	Success rate P1 (%)	P1 moving on to P2 (%)
Innovate UK	£45	£260	£4,401	29%	53%
DECC	£25	£873	£5,296	26%	40%
NHS	£89	£647	£1,654	12%	36%
MOD	£62	£157	£895	18%	22%
DH	£107	£499	£1,728	13%	33%
NC3Rs	£101	£862	£1,070	49%	30%
Other	£130	£981	£3,593	42%	60%
HO	£69	£397	£674	22%	20%
BIS	£51	£230	£1,059	24%	34%
DEFRA	£29	£156	£489	34%	33%
DAs	£34	£165	£467	22%	29%
DfT	£47	NA	£450	15%	NA
Overall	£57	£380	£1,754	21%	37%

(Source: Innovate UK Management Data)

Note:

In total 113 two-phase competitions were launched; 5 competitions had not yet awarded contracts by the time of analysis (e.g. DfT had not awarded any P2 contracts yet, by the time of analysis). This table includes all two-phase competitions which awarded either P1 contracts only or all planned contracts, the number of which is 108.

Departments are sorted according to value of contracts.

'Success rate' = number of contracts awarded / number of applications.

The table above forms Part 2 of the descriptive statistics of two-phase competitions which awarded contracts (either Phase 1 contracts, or both Phase 1 and Phase 2 contracts). In general, for those two-phase competitions, the average value of Phase 2 contracts (£380k) has been much higher than that of Phase 1 contracts (£57k). Meanwhile those average values differ from department to department. 'Other' departments (including DWP, FSA, OS, UKSA, RCs, IPO¹) have featured a high average value of Phase 1 contracts (£130k), while the average value of Phase 1 contracts awarded by DECC's two-phase competitions has been fairly low, at £25k. Again, 'Other' departments featured the highest average value of Phase 2 contracts (£981k), followed by DECC and NC3Rs with average values of Phase 2 contracts at £873k and £862k respectively.

The table also reviews the success rates of those two-phase competitions. For Phase 1, the success rate is a ratio between the number of Phase 1 contracts awarded and the number of Phase 1 applications received; for Phase 2, we consider the success rate as the ratio between the number of Phase 2 contracts awarded and the number of Phase 2 applications received (which in most cases is the same as the number of Phase 1 contracts awarded). For Phase 1, NC3Rs and other departments have achieved the highest success rate mostly owing to the fact that their calls received relatively fewer applications from firms. For Phase 2, the overall success rate for all departments has been higher. Among the major user departments, Innovate UK and DECC have achieved fairly high success rates at 53% and 40% respectively.

¹ IPO, RCs and UKSA belong to the BIS family.

Table 11 Innovate UK co-fund (by Department) October 2008 – July 2014

Department	Innovate UK contribution P1 (£k)	Innovate UK contribution P2 (£k)	Total Innovate UK contribution (£k)	Innovate UK co-fund P1 (%)	Innovate UK co-fund P2 (%)	Overall Innovate UK co-fund (%)
MOD	£7,999	£1,496	£9,494	21%	24%	21%
NC3Rs	£2,046	£1,962	£4,008	75%	19%	31%
NHS	£1,232	£1,828	£3,061	14%	8%	10%
BIS	£837	£1,659	£2,497	40%	52%	47%
Other	£500	£1,900	£2,400	22%	30%	28%
HO	£904	£364	£1,268	23%	9%	16%
DAs	£389	£779	£1,167	22%	42%	32%
DECC	£196	£750	£946	9%	3%	3%
DEFRA	£317	£617	£934	17%	28%	23%
DH	£500	£0	£500	8%	0%	3%
DFT	£100	£0	£100	7%	0%	6%
Total	£15,019	£11,355	£26,374	21%	12%	16%

(Source: Innovate UK Management Data)

Note:

This table only covers competitions which were non-Innovate UK competitions (i.e. competitions launched by other departments than Innovate UK), the number of which is 180.

The table above illustrates Innovate UK co-fund information of non-Innovate UK departments. Apart from BIS and NC3Rs which are in the same ‘BIS family’ as Innovate UK, DAs featured a high level of Innovate UK co-funding. Generally speaking, the level of co-funding has been higher for Phase 1 contracts, at 21%, while for Phase 2 contracts the level of co-funding has been much lower, at 12%. In the healthcare sector, NHS and DH received different levels of Innovate UK contribution, at overall ratios of 10% and 3% respectively. MOD has enjoyed the highest value of Innovate UK contribution, totalling £9.5m.

It should be noted that the picture was captured back in July 2014 when the study was conducted. It might change significantly as those two-phase competitions gradually reach Phase 2 and enter the stage of awarding new contracts.

3.2.3 Comparison between three periods

This section briefly compares the use of SBRI programme by different user departments across three successive periods (according to the opening month of first Phase):

Period 1: October 2008 – August 2010

Period 2: September 2010 – September 2012

Period 3: October 2012 – July 2014

Descriptive analysis has been conducted following similar methods used in the previous section. A number of tables have been produced to illustrate the characteristics of competitions in those periods. To save space we only do a brief summary of the three periods here; the tables containing statistical information have been attached in Annex 11.

In the remaining part of this section a few observations derived from this period analysis are presented.

Increasing size of use

In total, the user departments have launched 35 competitions during Period 1, 70 competitions during Period 2, and 90 competitions during Period 3. The size of use in terms of number of competitions has been expanding steadily with the implementation of SBRI programme being reinforced.

In terms of numbers of applications, we also observed a trend of steady growth. In Period 1, all the user departments attracted 2005 applications (Phase 1 and Phase 2 in total); in Period 2, the number reached 3073; in Period 3, the number reached 3344 – and we should bear in mind that not all competitions in Period 3 have finished their planned phases.

Turning to contracts, we observed a trend of steady growth both in terms of number of contracts and in terms of value of contracts. All the departments in total had awarded 532 contracts in Period 1 and 690 contracts in Period 2. For competitions launched in Period 3, by the time of analysis, the number of contracts had already reached 644. This number will grow as the ongoing competitions award new contracts. The total value of contracts awarded in Period 1 was around £40m; in Period 2 the value reached £85.7m; in Period 3 the value reached £101m and is still growing.

Increasing use of two-phase competitions as the dominant approach

From the perspective of phase characteristics, it appears to be that two-phase competitions have been used more and more as the dominant approach. In Period 1, among all the 35 competitions launched, 19 of them were Phase 1 only, 2 were Phase 2 only, and 14 were two-phase competitions. In Period 2, among all the 70 competitions launched, 26 were Phase 1 only, 11 were Phase 2 only, and 33 were two-phase competitions. In Period 3, among the 90 competitions launched, 22 were Phase 1 only, 2 were Phase 2 only, while the number of two-phase competitions reached 66.

User departments' profiles

In terms of contract values, Innovate UK has been the largest user in Period 1 (with c. £15.8m spent) and Period 2 (with c. £28m spent), followed by MOD as the second largest user. In Period 3, however, NHS has appeared to be most proactive in awarding contracts, with a total spending of c. £24.4m by the time of analysis. Again, this picture might look different later on as other departments award more contracts especially Phase 2 contracts which feature a much higher average value of contract.

It also should be noted that if we look at the two healthcare user departments (DH and NHS) together, they contribute to a very substantial proportion of SBRI spending. But from in-depth interviews we understand that DH and NHS do not fund competitions together or share common funding channels, thus we treat them as separate departments throughout.

Innovate UK Co-funding

In this period analysis we also looked at Innovate UK co-funding. In Period 1, NHS had received the largest amount of Innovate UK contribution, with a total value of c. £1.6m (£684k for Phase 1 and £951k for Phase 2). This had contributed to 38% of NHS's spending on SBRI during this period. Also significant had been Innovate UK contributions to DECC, MOD and DEFRA. For DECC and DEFRA, the Innovate UK contributions were of the equivalent amount of money as the two departments spent themselves; while for MOD, the weight of Innovate UK contribution compared to its own spending appeared very small, at 7%.

In Period 2, MOD benefitted from an even larger amount of Innovate UK contribution, totalling £5.5m, accounting for 24% of MOD's total value of contracts. Departments belonging to the BIS family also benefitting from substantial Innovate UK contributions with a total value of over £4m. NHS and HO enjoyed the highest level of Innovate UK co-funding which accounted for 50% of their value of contracts.

The picture we captured for Innovate UK co-funding in Period 3 can only reflect the situation for the period up to July 2014 and it might look very different now as the competitions unfold. By July 2014, again, MOD benefitted the most from Innovate UK co-funding with a total contribution of c. £3.3m.

Summary

To sum up this comparison section, the study team would like to draw attention to the following patterns observed through this period analysis.

- The SBRI programme has been increasingly used by most departments during 2008-2014, in terms of various indicators including: the number of competitions launched, the number of applications received, the number of contracts awarded and the value of contracts awarded.
- Two-phase competitions have appeared as the more and more frequently used approach across departments, taking up 40% of all competitions in Period 1, 47% in Period 2, and as high as 73% in Period 3.
- Innovate UK, MOD and NHS have been among the most proactive departments in using SBRI throughout the three periods.
- MOD has been consistently benefitting from Innovate UK co-funding throughout the three periods, while co-funding for other departments has not shown strong regularities.

3.2.4 Mode analysis – policy versus operational

This section looks at the competitions through the lens of ‘modes’, i.e. whether the competitions were driven by ‘operational’ or ‘policy’ challenges. In particular, by ‘operational competition’ we mean the competitions which are driven by the user department’s operational requirements for innovation; by ‘policy competition’ we mean the competitions which are driven by the need for more general innovations in a specific policy area. In the situation of policy competitions, the government will not itself be a purchaser or user; the competitions seek to deliver innovative solutions which otherwise might not be delivered by the market itself.

Table 12 Count of operational and Policy Competitions (by Department)

Department	Number of operational competitions	Number of policy competitions	Total
MOD	78	0	78
NHS	23	0	23
Innovate UK	0	15	15
NC3Rs	0	15	15
HO	11	1	12
DEFRA	0	11	11
DAs	3	6	9
DH	9	0	9
DECC	0	7	7
Other	2	5	7
BIS	0	5	5
DfT	4	0	4
Total	130	65	195

(Source: Innovate UK Management Data)

Note:

This table includes all competitions that were launched, the number of which is 195 excluding PCP competitions. Departments are sorted according to size of use.

The table above provides an overview of all the launched competitions from the perspective of ‘mode’. Among all the 195 competitions, 130 were operational competitions, and 65 were policy competitions. The table above illustrates that for departments such as healthcare (DH and NHS) and MOD, competitions are exclusively ‘operational’, i.e. for their own use as end users. While for departments such as DECC, Defra, and those belonging to the BIS family (including BIS, NC3Rs and Innovate UK), competitions are exclusively in the ‘policy’ mode. For other departments the nature of competitions has been mixed.

It should be noted that without MOD competitions taken into account the picture would appear very different. Among the 130 operational competitions, 78 were launched by MOD. This makes the total number of operational competitions as large as double that of policy competitions (65 in total). Excluding MOD competitions, however, we see that the other departments in total launched 52 operational competitions and 65 policy ones.

Table 13 Phases of operational versus policy competitions October 2008 – July 2014

Phase	Number of operational competitions	Number of policy competitions	Total
P1 only	58	9	67
P2 only	2	13	15
two phase	70	43	113
<u>Total</u>	<u>130</u>	<u>65</u>	<u>195</u>

(Source: Innovate UK Management Data)

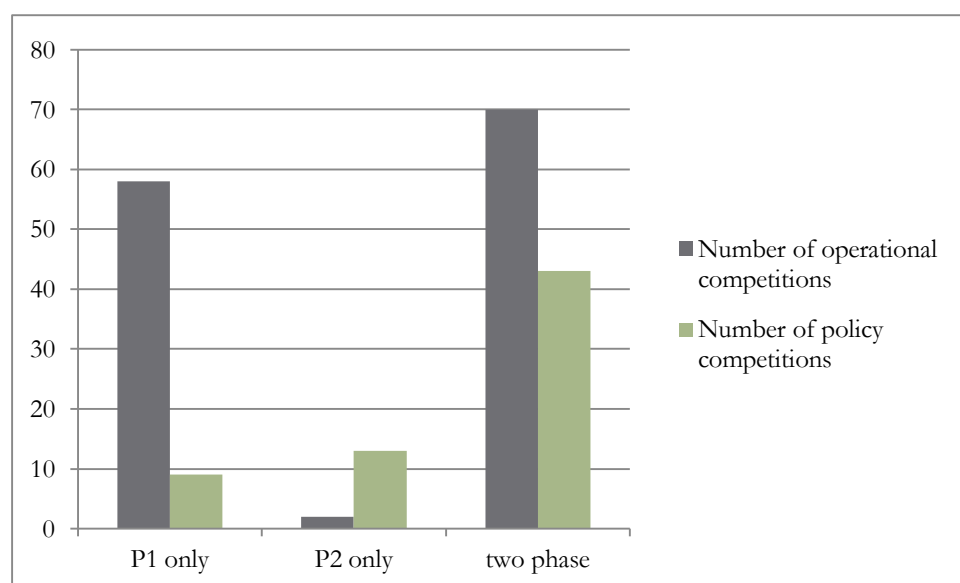
Note:

This table includes all competitions that were launched, the number of which is 195 excluding PCP competitions.

Moving on to ‘phase’ characteristics versus ‘mode’, the table above shows that among all the 130 operational competitions, 58 were Phase 1 only competitions, 2 were Phase 2-only competitions, and 70 were two-phase competitions. In particular, 58 out of the 67 Phase 1-only competitions were ‘operational’ competitions, while 13 out of the 15 Phase 2-only competitions were ‘policy’ competitions.

This is further visualized in the figure below. Again, this picture is strongly associated with the inclusion of MOD competitions, which feature a high proportion of Phase 1 competitions and operational competitions.

Figure 7 Count of Operational and Policy Competitions by Form of Competition (P1, P2, P1+P2)



(Source: Innovate UK Management Data)

Table 14 Operational and policy competitions: applications and contracts October 2008 – July 2014

	Operational	Policy	Total	Operational (%)	Policy (%)	Total
Number of applications (P1)	5172	2016	7188	72%	28%	100%
Number of applications (P2)	322	912	1234	26%	74%	100%
<u>Total number of applications</u>	<u>5494</u>	<u>2928</u>	<u>8422</u>	<u>65%</u>	<u>35%</u>	<u>100%</u>
Number of contracts awarded (P1)	907	569	1476	61%	39%	100%
Number of contracts awarded (P2)	115	275	390	29%	71%	100%
<u>Total number of contracts awarded</u>	<u>1022</u>	<u>844</u>	<u>1866</u>	<u>55%</u>	<u>45%</u>	<u>100%</u>
Value of contracts awarded (P1) (£k)	£61,060	£24,829	£85,889	71%	29%	100%
Value of contracts awarded (P2) (£k)	£49,295	£91,123	£140,418	35%	65%	100%
<u>Total value of contracts awarded (£k)</u>	<u>£110,355</u>	<u>£115,952</u>	<u>£226,307</u>	<u>49%</u>	<u>51%</u>	<u>100%</u>

(Source: Innovate UK Management Data)

Note:

This table includes all competitions that awarded contracts, the number of which is 186.

The table above gives an idea of the characteristics of applications and contracts for each competition mode. In total, operational competitions have attracted 5494 applications and awarded 1022 contracts with a total value of c. £110m; policy competitions have attracted 2928 applications, and awarded 844 contracts with a total value of c. £115m. The spending on each mode of competitions has been fairly close.

Relatively speaking, operational competitions tended to attract more applications than policy competitions; around 65% of all applications were made to operational competitions, while 35% made to policy competitions. In terms of number and value of contracts awarded, however, shares of operational and policy competitions were fairly close. Policy competitions, accounting for only 35% of all applications and 45% of number of contracts, took up 51% of total spending.

3.2.5 Firm size breakdown (October 2008 – July 2014)

This section briefly reviews the characteristics of competitions according to firm sizes. The following table has been derived from the Innovate UK management data (up to July 2014). Not all competition records contained firm size data; only the subset of 1764 applications with firm size information has been analysed here.

Table 15 Count of applications, contracts and contract value (by Firm Size) October 2008 – July 2014

	Number of applications	Number of contracts awarded	Value of contracts (£k)	Number of applications (%)	Number of contracts awarded (%)	Value of contracts (%)	Rate of success (%)
Large	333	129	£5,146	19%	32%	30%	39%
Medium	167	63	£1,680	9%	15%	10%	38%
Small	330	77	£3,244	19%	19%	19%	23%
Micro	934	140	£6,905	53%	34%	41%	15%
Subset total/average	1764	409	£16,975	100%	100%	100%	23%

Note:

Data not available for all competitions; only the subset of 1764 applications with firm size information included.

Size definition according to EU definition

http://europa.eu/legislation_summaries/enterprise/business_environment/n26026_en.htm. Number of employees: Large >250; 50 ≤ Medium <250; 10 ≤ Small <50; Micro <10

Rate of success=number of contracts awarded/ number of applications.

According to the table above, micro firms account for more than half of the applications submitted to SBRI; they are the most active applicants participating in the SBRI programme, followed by large and small sized firms. Medium firms filed fewer applications, but their likeliness of winning a contract has been higher than other groups. The average success rate of all applicants has been 23%, i.e. around 23% of the applicants in the sample successfully received contracts.

Among all types of firm applicants, the success rate of large firms has been the highest – 39% of the applicants received a contract. While micro firms have suffered from the lowest success rate which is only 15%. A fairly clear pattern here is that the larger the firm is, the more likely for it to get SBRI contracts. In terms of value of contracts, micro firms have received the most significant share, accounting for 41% of the money spent.

3.2.6 Region breakdown (October 2008 – July 2014)

This section briefly reviews the geographical characteristics of competitions. The following table has been derived from Innovate UK management data (up to July 2014). Not all competition records contained firm location data; only the subset of 1788 applications with location information has been analysed here.

Table 16 Count of applications, contracts and contract value (by Region)

	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 (%)
Mid	454	85	£3,623	25%	21%	21%	19%
N.Ireland	79	17	£579	4%	4%	3%	22%
Non-UK	62	11	£1,058	3%	3%	6%	18%
North	305	71	£2,649	17%	17%	15%	23%
Scotland	82	23	£1,215	5%	6%	7%	28%
South	754	192	£7,874	42%	47%	45%	25%
Wales	52	12	£462	3%	3%	3%	23%
Subset total	1788	411	£17,459	100%	100%	100%	23%

Note: Data not available for all competitions; only the subset of 1788 competitions with region information is included. Rate of success = number of contracts awarded / number of applications; PCP and CHARM competitions are excluded.

*East Midlands (Mid); East of England (Mid); West Midlands (Mid)
 London (South); South East (South); South West (South)
 North East (North); North West (North); Yorkshire and The Humber (North)
 Northern Ireland (N.Ireland)
 Scotland
 Wales
 Outside UK (Non-UK)*

The table above illustrates that firms located in the South are the most active applicants to the SBRI programme (accounting for 42% of all submitted applications), followed by firms in the Midlands and the North. Firms in the South accounts for nearly half of the contracts awarded and of the money spent.

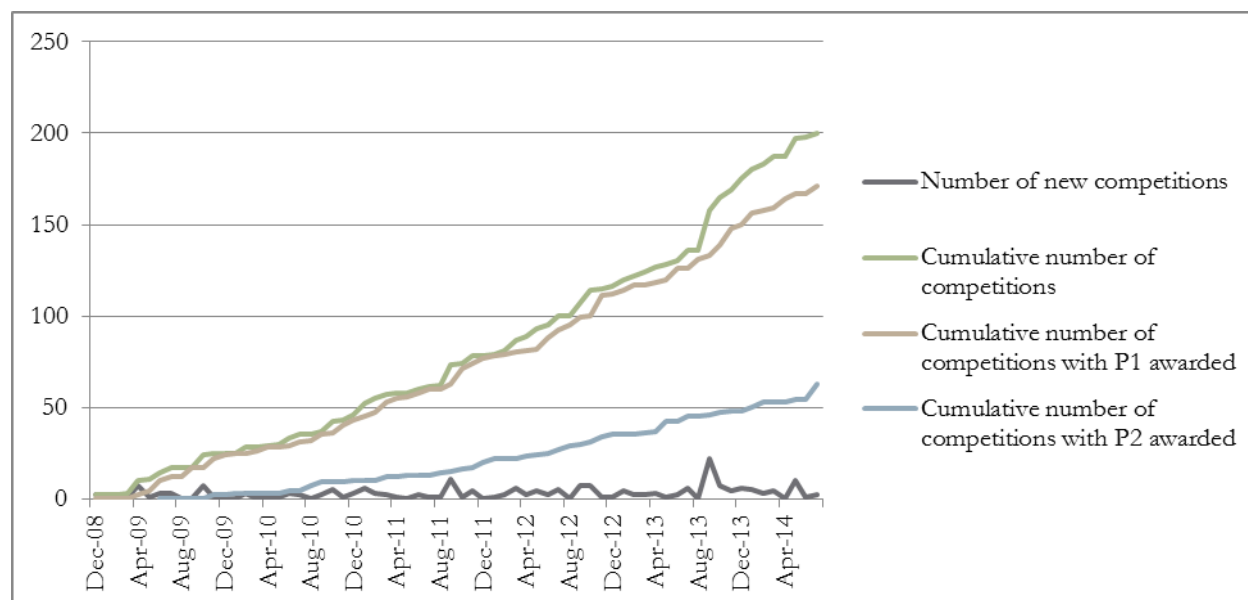
Non-UK firms and firms in Wales filed the least applications to the SBRI programme; in terms of rate of success, firms in Wales enjoyed a higher percentage than Non-UK firms (23% versus 18%), although the value of contracts gained by Non-UK firms has been much higher than that of firms from Wales (c. £1m versus £462k).

The sample has an average success rate as 23%, with firms from Scotland and the South enjoying a high rate of 28% and 25% respectively. Domestic firms in the Midlands, however, have been least likely to win a contract, with a success rate of 19%.

3.2.7 Overall trend analysis (December 2008 – July 2014)

This section summarizes the cumulative records of all competitions during the period of December 2008 – July 2014.

Figure 8 Count of competitions by Year: December 2008 – July 2014



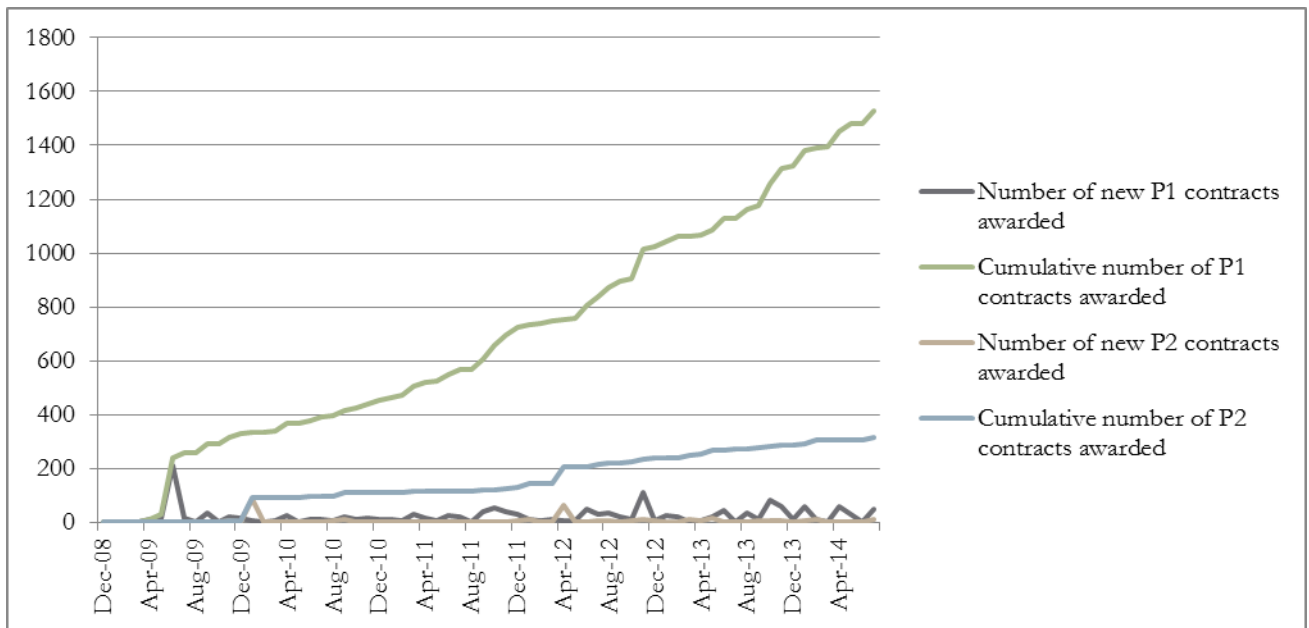
(Source: Innovate UK Management Data)

The figure above captures the trends of competitions launched and run during December 2008 – July 2014 in terms of new competitions, cumulative numbers of competitions and contracts awarded. The earliest competitions were launched by DH (back in October 2008) and MOD (back in March 2009).

In April 2009 there appeared the first significant growth in the number of competitions, from 3 to 10 with 7 new competitions launched by a number of departments including NHS, HO, MOD and Innovate UK. In October 2009 MOD and NHS launched 7 new competitions which contributed to the second peak. Later on, peaks appeared in September 2011, September 2013, and recently May 2014. Healthcare sponsors (DH and NHS), MOD and the BIS family (in particular NC3Rs and Innovate UK) have been the most proactive users in launching those new competitions.

The overall trends of cumulative numbers have appeared fairly steady. Still we can observe a faster growth rate since September 2013 when 22 competitions were launched intensively by Defra, MOD, NHS, BIS, and NC3Rs.

Figure 9 Count of contracts awarded by Year: December 2008 – July 2014

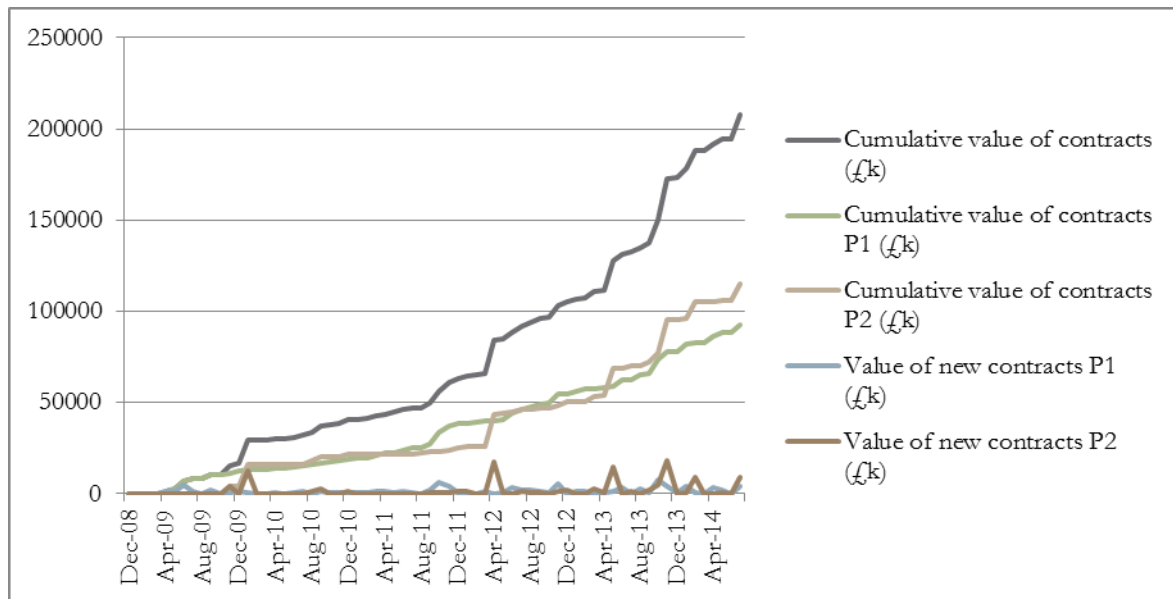


(Source: Innovate UK Management Data)

The figure above gives an idea of the trend of SBRI programme in terms of number of contracts awarded. The trend of new contracts awarded has been following that of new competitions launched as shown in the previous figure. Following the launching of 7 new competitions in April 2009, in June 2009 there appeared a peak in terms of the number of new Phase 1 contracts awarded. Around the end of the year 2009, there had been a peak in terms of number of new Phase 2 contracts awarded.

In general, during 2009-2012, following each peak of number of new Phase 1 contracts there had been a peak of number of new Phase 2 contracts. Lately, however, the number of new Phase 2 contracts has grown very slowly despite the fact that the number of Phase 1 contracts has been growing very fast. This trend, again, is expected to change significantly once the recently launched two-phase competitions enter the stage of awarding Phase 2 contracts. By the time of analysis, most of those newly launched two-phase competitions had only been in the stage of awarding Phase 1 contracts.

Figure 10 Value of contracts awarded by Year: December 2008 – July 2014



(Source: Innovate UK Management Data)

The figure above summarizes the overall trends of the SBRI programme in terms of contract values. In general, the trends shown in this figure in terms of key turning points followed that of the number of contracts awarded. In June 2009 there had been a first peak of Phase 1 contract value. By the end of 2009/early 2010, the awarding of Phase 2 contracts of a number of competitions contributed to a significant growth of cumulative value of contracts.

As discussed previously, the average value of Phase 2 contracts has been much higher than that of Phase 1 contracts. This is further illustrated in this figure, which shows that the cumulative values of Phase 1 contracts and Phase 2 contracts have been very close to each other, although the cumulative numbers of those two categories of contracts differ a lot.

The cumulative value of all contracts awarded has been growing faster since November 2013, with the awarding of Phase 2 contracts totalling a value of c. £18.2m.

3.3 Review of Programme Use: Experiencing SBRI: The Company View

3.3.1 Introduction

In this section of the report we provide a profile of the characteristics of SBRI applicants over the 2011-12 period and an overview of their experience of applying for and receiving, or not receiving, SBRI support. Data is taken primarily from the first of two company surveys – the evaluation survey – undertaken between November 2014 and January 2015 and relating to firms which either applied for or received support from SBRI before September 2012. The conduct of this survey – with the attendant difficulties – is described in detail in Annex 4 – Conducting the Company Surveys. Here we focus on profiling SBRI applicants and their experiences of SBRI. Section 3 considers the scheme’s impact.

In reading this Section it is important to acknowledge that material relates only to those SBRI competitions run by departments other than the MOD. Some qualitative comments based on a very small sample of applicants to MOD competitions are included in Annex 6 – Qualitative feedback on MOD Competitions.

The section proceeds as follows:

- Section 3.3.2 provides a profile of SBRI applicants drawn primarily during the 2011-12 period drawing on the evaluation survey. (Annex 5 provides a comparison of applicants during the more recent 2013-14 period drawing on the Baseline Survey)
- Section 3.3.3 and 3.3.4 profiles how firms found out about the SBRI scheme and their reasons for applying to the SBRI scheme. Perhaps unsurprisingly the primary reason for applying to the scheme was to ‘get help in developing a new technology’.
- Section 3.3.5 provides an indication of firms’ views of the application process and what happened to projects when firms were unsuccessful in applying for Phase 1 support. Views of the application process were overwhelmingly positive with the vast majority of applicants regarding both the pre-application consultation and application process itself helpful. Few projects would have proceeded without SBRI support and where Phase 1 support was provided the vast majority of firms achieved all or the majority of their initial objectives.
- Section 3.3.6 focuses on Phase 2. Here, respondent numbers to the evaluation survey were low and so results need to be regarded as indicative only. Views of the Phase 2 application process and the profile of additionality are broadly similar to Phase 1: firms found the application and consultation process useful and without support few projects would have proceeded. Among Phase 2 winners, most firms again achieved all or the majority of their objectives.

3.3.2 Profiling SBRI applicants

564 SBRI applicants and winners were included in the final sampling frame for the evaluation survey (Table 59). Response rates to the evaluation survey were in the range 54 to 67 per cent providing a final response consisting of 174 unsuccessful applicants and 48 Phase 1 and Phase 2 winners. In addition we constructed a control group of non-applicant firms matched on sector and firm size band. Annex 4 provides more detail on the derivation of sampling frames and the evaluation survey which was conducted with these firms.

3.3.3 Who applies for SBRI?

Administrative data provides some information on the size distribution of SBRI applicants with 45.8 per cent being micro firms with less than 10 employees, a further 19.8 per cent being small firms with 10-50 employees, 8.4 per cent having 50-249 employees and the remaining quarter being larger firms with more than 250 employees (Table 17). Compared to the UK firm population, small firms (10-49 employees) are under-represented in the applicant group with larger firms (250 plus) significantly over-represented. In terms of sector, applicants were concentrated in Information and Communication (29.6 per cent), professional, scientific and technical activities (26.3 per cent) and administrative and support service activities (12.5 per cent). Each of these sectors is significantly over represented in comparison to the UK population of firms. The proportion of applicants in manufacturing (8.8 per cent) and healthcare (8.7 per cent) were broadly in line with the population proportions Table 17.

Table 17 Size and sectoral analysis of SBRI Applicants

	SBRI Applicants	All UK Firms
A. Size band analysis		
Fewer than 10 employees	45.8	53.3
10-50 employees	19.8	38.5
50-250 employees	8.4	6.6
250 plus employees	26.0	1.7
Total	100.0	100.0
B. Sectoral analysis		
Manufacturing	8.80	7.4
Construction	1.24	6.8
Wholesale and retail trade; repair of motor vehicles and motor cycles	5.95	23.3
Information and communication	29.62	2.8
Real estate activities	1.61	2.4
Professional, scientific and technical activities	26.27	7.5
Administrative and support service activities	12.52	7.9
Education	2.60	5.6
Human health and social work activities	8.67	10.9
Other service activities	2.73	10.17
Total	100.00	100.0

(Source: Applicants: Size distribution based on consolidated Innovate UK and departmental administrative data (n=933). Sectoral data based on authors' name match of SBRI applicants with Experian database (see Annex 4 for details, n=807). UK size distribution (firms with 5 or more employees), UK Business Activity, Size and Location – 2010. Sectoral distribution (firms with 5 or more employees, excludes primary), Table 70, ibid.)

The concentration of SBRI applications among larger firms suggests the group of applicant firms are likely to be more innovation active than the general population of smaller firms. In the UK Innovation Survey, 2013, for example, 50 per cent of UK firms with 250 or more employees were said to be 'innovation active' compared to 45 per cent of smaller firms(23). The over-representation in the applicant group of firms in manufacturing and knowledge intensive services such as ICT and Professional, scientific and technical activities is likely to reinforce the more innovative orientation of the applicant group. Data

from the UK Innovation Survey 2013, for example, again suggests that the proportion of innovation active firms in manufacturing sectors varied from 52.7 – 60.8 per cent compared to a national average of 44.4 per cent. Similarly, proportions of innovation active firms in knowledge intensive business services sectors were typically in the range 55-64 per cent, again well above the national average figure (23).

The evaluation survey provides information on the age distribution of SBRI applicants, winners and members of the control group (or ‘non-applicants’). While there is a broad similarity in terms of the age distribution of each group, the applicant groups included a higher proportion of younger firms (2 to 10 years) and a lower proportion of older firms (over 10 years) than the non-applicant group. Note however that the proportion of very young firms within the survey sample, i.e. those established 2 years ago, was very small (2.1 per cent) (Table 18). This proportion was slightly higher among Phase 1 and Phase 2 winners (3.0 per cent) and slightly lower for both the unsuccessful applicant and non-applicant groups (1.6 and 1.7 per cent respectively). The proportion of applicants, both successful and unsuccessful, established within the previous 10 years was also much higher than that for the non-applicant group: 44.7 per cent of Phase 1 and Phase 2 winners and 42.9 per cent of unsuccessful applicants compared to 23.8 per cent of non-applicant firms.

In general this suggests 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 (Table 18).

Table 18 Time since the business was first established

	% Non-applicants (N=353)	% Non-winners (N=171)	% Winners (N=48)	% Total (N=572)
2 years ago	1.7	1.6	3.0	2.1
3 to 4 years ago	6.6	14.8	14.5	9.7
5 to 6 years ago	4.8	9.8	5.0	5.7
7 to 8 years ago	4.8	10.4	17.1	7.5
9 to 10 years ago	5.9	6.3	5.1	6.0
11 to 15 years ago	20.4	14.1	14.6	18.1
16 to 20 years ago	10.1	6.7	1.4	8.3
Over 20 years ago	45.7	36.3	39.3	42.6
Total	100	100	100	100

(Sources: evaluation survey data, observations are weighted. $X^2=9.28$, $p=0.679$)

As part of the evaluation survey firms were also asked to identify if they were an independent business with no subsidiaries, a business with subsidiaries or a subsidiary of another business. A small proportion of the total sample (4.6 per cent) represented ‘other’ business types (Table 19). This group includes other answers that were given by respondents such as university departments, charities and NHS foundation trusts.

Table 19 Business type

	% Non-applicants (N=357)	% Non-winners (N=168)	% Winners (N=48)	% Total (N=573)
Independent business with no subsidiaries	74.0	66.3	62.8	70.8
A business with subsidiaries	7.3	14.9	3.3	9.2
A subsidiary of another business	14.8	13.3	26.9	15.4
Other	3.9	5.5	7.0	4.6
Total	100	100	100	100

(Source: evaluation survey data, observations are weighted. Differences between groups were significantly different: $X^2=34.72$, $p=0.000$.)

'Other' business types had a slightly larger representation among Phase 1 and Phase 2 winners (7.0 per cent) and a slightly smaller representation among non-applicants (3.9 per cent) than within the survey sample as a whole. Independent businesses with no subsidiaries represented 70.8 per cent of the survey sample. They were a slightly smaller proportion of SBRI applicants, 62.8 per cent of those that were successful in their application and 66.3 per cent of those that were unsuccessful. The proportion of businesses with subsidiaries among Phase 1 and Phase 2 winners was small (3.3 per cent) but a larger proportion of unsuccessful applicants (14.9 per cent). Perhaps the key difference here in terms of business type however is that approximately one quarter (26.9 per cent) of Phase 1 and Phase 2 winners were a subsidiary of another business. They represented a smaller 15.4 per cent of the total sample, 13.3 per cent of unsuccessful applicants and 14.8 per cent of non-applicants.

We asked firms about the percentage of their employees with a degree level qualification or higher. Across the total sample, 17.8 per cent of firms had 0 to 4 per cent of their employees holding a degree level qualification (Table 20). This proportion was higher for non-applicant firms (26.1 per cent) and much lower for both unsuccessful and successful applicants (4.4 and 2.6 per cent respectively). SBRI applicants had a significantly more highly qualified workforce than comparable non-applicants: 82.0 per cent of successful SBRI applicants had 50 per cent or more of their employees qualified to at least degree level compared to 38.7 per cent for non-applicants ($X^2=89.6$, $p=0.000$).

Table 20 Percentage of employees with a degree level qualification or higher

	% Non-applicants (N=340)	% Non-winners (N=157)	% Winners (N=47)	% Total (N=544)
0 to 4 per cent	26.1	4.4	2.6	17.8
5 to 9 per cent	8.2	1.6	0.9	5.7
10 to 19 per cent	10.6	7.8	3.7	9.2
20-49 per cent	16.4	6.3	10.7	12.9
50 per cent or more	38.7	79.9	82.0	54.4
Total	100	100	100	100

(Source: Company survey data, observations are weighted.)

We asked firms if they sold products and/or services overseas. Across the total survey sample, 42.0 per cent of firms said that they engaged in exporting. The proportion was similar for winners (40.0 per cent) and higher for unsuccessful applicants (55.7 per cent) ($X^2=44.59$, $p=0.000$). Slightly fewer non-applicants

engaged in exporting with 36.4 per cent saying that they sold products and services abroad. We also asked firms about the percentage of their current sales made to the UK, the EU and Non-EU countries. Within the total sample, 41.4 per cent of firms made 80 per cent or more of their sales in the UK. The proportion was slightly higher for Phase 1 and Phase 2 successful applicants (43.7 per cent) and non-applicants (44.7 per cent) and slightly lower for unsuccessful applicants (35.8 per cent), although it should be noted that the number of winners who provided this data was very small (15).

To help understand potential displacement and/or multiplier effects we also asked firms about the proportion of goods and service inputs they sourced from within the UK. 71.9 per cent of the total sample sourced 80 per cent or more of their goods and service inputs from within the UK (Table 21). Only 2.7 per cent of the total sample sourced no goods and service inputs from within the UK. The proportion was similar across individual groups. A similar proportion of successful, unsuccessful and non-applicant firms sourced no goods and service inputs from within the UK (3.0, 2.6, and 2.7 per cent respectively). Almost all successful applicants sourced 40 per cent or more of their goods and service inputs from within the UK (97 per cent). This can be compared to 86.3 per cent of unsuccessful applicants and 86.4 per cent of non-applicant firms.

Table 21 Proportion of goods and service inputs that are sourced from within the UK

	% Non-applicants (N=330)	% Non-winners (N=157)	% Winners (N=41)	% Total (N=528)
0 per cent	2.7	2.6	3.0	2.7
1 to 9 per cent	3.2	3.1	0.0	2.9
10 to 19 per cent	3.1	2.1	0.0	2.6
20 to 39 per cent	4.6	5.8	0.0	4.6
40 to 59 per cent	6.4	9.7	10.8	7.7
60 to 79 per cent	5.8	10.3	11.6	7.6
80 per cent or more	74.2	66.3	74.6	71.9
Total	100	100	100	100

(Source: evaluation survey data, observations are weighted. $X^2=31.44$, $p=0.012$.)

SBRI is one of a number of public support measures for innovation. We therefore asked firms if they were aware of a number of particular support schemes for R&D and innovation. All of the successful applicants were aware of at least one support scheme other than SBRI (Table 22). 7.2 per cent of unsuccessful applicants were unaware of all of the support schemes mentioned. Within the non-applicant group, the proportion of firms that were unaware of all of the support schemes mentioned (including SBRI) was much larger (44.9 per cent). Within the successful applicant group, awareness of the individual schemes ranged between 63.9 and 80.3 per cent. The proportions were lower for the unsuccessful applicant group, ranging between 44.3 and 74.2 per cent. Awareness of support schemes in the non-applicant group was much lower. Awareness of the individual schemes ranged between 10.7 and 32.5 per cent. Only around a fifth (22.6 per cent) of firms in the non-applicant group were aware of the SBRI programme.

Table 22 Awareness of government support schemes for R&D and innovation

	% Non-applicants (N=358)	% Non-winners (N=174)	% Winners (N=48)	% Total (N=580)
Collaborative R&D Grants	14.3	51.9	67.0	29.9
Catapult Centres	10.7	48.7	63.9	26.5
Innovation Vouchers	12.0	44.3	73.4	26.7
R&D Tax Credits	32.5	64.2	80.3	46.0
EU Framework programmes	22.0	74.2	79.6	42.4
Horizon 2020	11.3	67.1	70.3	32.9
SBRI (Non-applicants only)	22.6	-	-	-
Not aware of any of the above	44.9	7.2	0.0	29.9

(Source: evaluation survey data, observations are weighted)

Alongside firms' knowledge of different R&D and innovation support measures we also asked firms if they had actually received support for technological development from the UK government or European schemes during the last 5 years. Across the total sample, 31.1 per cent of firms received support in addition to SBRI. The proportion was higher for SBRI applicants with 79.8 per cent of successful applicants and 55.4 per cent of unsuccessful applicants receiving additional support during the last 5 years. The proportion of non-applicants receiving support from elsewhere was much lower (13.2 per cent). Given that a large proportion of the non-applicant firms were unaware of the support schemes available this is perhaps unsurprising.

To summarise, SBRI applicants and winners exhibit some marked contrasts with the wider population of non-applicants:

- SBRI applicants are slightly younger than the business population as a whole, although the majority of applicants remain mature firms;
- SBRI applicants are similar to the general population in terms of the type of businesses they represent (independent, subsidiary etc.). SBRI winners are more likely to be subsidiary firms.
- SBRI applicants have a much better qualified workforce than non-applicants – nearly twice as many SBRI applicants have a 50 per cent graduate workforce as non-applicants.
- Exporting and international sourcing profiles are similar for SBRI applicants and non-applicants.
- SBRI applicants have a much greater knowledge about government supports for innovation and R&D than non-applicants. Only around a quarter of non-applicants were aware of SBRI, a larger proportion than were aware of other Innovate UK schemes.

3.3.4 Approaching the SBRI scheme

The majority of applicants to the SBRI programme (60.2 per cent) during 2011-12 period had previously been suppliers to the public sector. This proportion was slightly lower among Phase 1 and Phase 2 winners (57.6 per cent) compared to non-winners (60.8 per cent) although this difference was statistically insignificant ($F(1, 215)=0.13$, $\rho=0.72$). Despite their previous relationship with the public sector, firms found out about the SBRI scheme from a number of diverse sources, although the most common sources of information about the scheme during 2011-12 were 'Brokerage or referral from a third party' which

accounted for around a quarter of all applications and the Innovate UK website which accounted for 1:6 or 14.0 per cent of all applications (Table 23). ‘Other’ sources of information were also important although these seem primarily to have been contacts with other government departments. There is little indication, however, that prior experience of being a supplier to the public sector made these departmental referrals more likely – 61.0 per cent of those firms reporting ‘Other’ sources of information about SBRI were previously public sector suppliers only marginally above the level for the whole group of SBRI applicants.

Table 23 How do firms hear about SBRI?

(Winners and non-winners, N=222)

Source of information about SBRI	%
Brokerage or Referral from a third party	27.6
The Technology Strategy Board website	14.0
Leaflets (including email) about the SBRI scheme	10.4
Another business	9.3
Being contacted directly by the Technology Strategy Board	6.7
Higher Education Institution (e.g. university)	3.1
An event or workshop which was held by, or run in conjunction with the Technology Strategy Board or other government department	3.0
Enterprise Agency	1.8
Through a Knowledge Transfer Network or other technology network	1.4
Consultant	0.5
Chamber of Commerce	0.4
Other	21.9
Total	100.0

(Source: evaluation survey data, observations are weighted.)

As part of the evaluation survey SBRI applicants were also asked to identify the main reason why they sought support from the scheme. Here we see a significant difference between the winners and non-winners, with winners having a stronger focus on technology development while non-winners were seeing SBRI more as a means of growing sales, or accessing new market opportunities (Table 24).

Table 24 Main reason for seeking SBRI support: winners and non-winners

	% Non-winners (N=149)	% Winners (N=38)	% Total (187)
To help your business grow	20.1	15.8	19.3
To grow your sales to the public sector	8.7	5.3	8.0
To get help in developing a new technology	40.3	65.8	45.5
To get access to specific technical expertise	6.7	0.0	5.3
To get access to new market opportunities	24.2	13.2	21.9
Total	100.0	100.0	100.0

(Source: Company survey data.)

3.3.5 Applying and winning Phase 1 support

We also asked firms about their views of the pre-application information provided about SBRI and the application process. Here – perhaps unsurprisingly – there were significant differences in view between winners and non-winners across each of the indicators. Specifically, the question sought firms’ agreement with a series of four statements. 82.3 per cent of applicants agreed that ‘the pre-application consultation and information was helpful’, 71.6 the application process helped formalise the technical objectives of the project and seemed appropriate (Table 25). The second of these points – the value of the application process in formalising the objectives of the project – is particularly interesting given other evidence of the value of structured application processes in helping firms to develop their thinking. Around 40 per cent of firms felt that the application process was overly complex, although this figure fell to only 11.5 per cent among winners.

Table 25 Views of the application process: winners and non-winners, % agreeing

	% Non-winners (N=159)	% Winners (N=45)	% Total (204)
The pre-application consultation and information process was helpful	78.8	94.4	82.3
The application process helped me to formalise the technical objectives of the project	66.8	88.6	71.6
The application process seemed appropriate for the competition	68.7	91.9	74.0
The application process was overly complex and time consuming	47.3	11.5	39.4
Total	100.0	100.0	100.0

(Source: Company survey data, observations are weighted. In each case the differences between winners and non-winners were significant. Tests as follows in the same order as the table: $F(1, 191) = 10.44, rbo = 0.0015$; $F(1, 205) = 12.93, rbo = 0.0004$; $F(1, 207) = 19.17, rbo = 0.0000$; $F(1, 203) = 31.35, rbo = 0.0000$.)

Where a Phase 1 application was not awarded funding what happened to the project? This is important as it provides an indication of the additionality of Phase 1 support. In more than half of cases (51.7 per cent)

the project stopped completely when funding was not awarded. In only around 4.6 per cent of cases where Phase 1 funding was not awarded the project continued anyway, i.e. the project would have continued with or without the funding. In around 39.1 per cent of cases the project continued anyway albeit generally at a reduced pace or scale – an indication of partial additionality.

Table 26 Outcomes where Phase 1 project applications were rejected

	%Non-winners (N=174)
A. Project outcomes	
The project stopped completely	51.2
The project continued in exactly the same way	4.6
The project continued but was modified	39.1
(Don't know/Refused)	5.2
Total	100.0
B. Project changes where continued but was modified	
Proceed, but with a delayed start	8.8
Proceed, but more slowly than it would have done with SBRI support	48.5
Proceed, but with less of your time or resources invested	57.4

(Sources: Company survey data, non-winners only.)

Where Phase 1 support was received more than half of all Phase 1 winners (including those who went on subsequently to either apply for or receive Phase 2 support) achieved all of their key project objectives Table 27. This rises to nearly 90 per cent when we include those Phase 1 winners who achieved the majority of their project objectives. The relatively small group of (20) Phase 1 winners who did not achieve all of their project objectives were asked the reasons for this. Reasons varied but the most common were reported to be: unanticipated difficulties with the technology (6 firms); a lack of clarity in the project specification (6 firms); lack of finance (4 firms); and, a lack of interaction with the sponsoring department (4 firms).

Table 27 Achievement of Phase 1 objectives: Phase 1 and Phase 2 winners

	Winners (N=48)
Phase 1 achieved all of its key objectives	54.17
Phase 1 met the majority of its objectives	35.42
Phase 1 met some of its objectives	4.17
Phase 1 met none of its objectives	2.08
(Don't know/Refused)	4.16
Total	100

(Sources: Company survey data, Phase 1 winners only.)

3.3.6 Applying and winning Phase 2 support

In this section we focus briefly on some project outcomes linked specifically to Phase 2 of the SBRI. We consider two issues. First, and more briefly, whether the application process for Phase 2 itself provided any benefits for firms. Secondly, the results of firms' Phase 2 projects where these were awarded. Here, the small number of respondents (18) makes any definitive conclusions difficult and the results need to be regarded as indicative only.

In the evaluation survey data we have information from 45 firms which applied for Phase 2 support either successfully (18) or unsuccessfully (27). Of these firms 76.5 per cent regarded the application process as useful in helping them formulate their technical objectives more clearly, 60.4 per cent said the application procedure 'challenged my idea and made me give it more detailed consideration', while a smaller proportion 24 per cent of firms saw the application procedure as overly complex. These responses closely reflect those of the Phase 1 application process recorded in Table 27. Here, perhaps due to the smaller number of observations, we see no significant differences between the pattern of responses between Phase 2 winners and non-winners in terms of their views of the value/complexity of the application process².

Among the 27 firms whose Phase 2 applications were unsuccessful 10 stopped the project at that point, 7 continued the project in the same way and a further 10 continued the project either more slowly or with fewer resources (Table 28). Respondent numbers here are small and so any implication from these proportions should be taken as indicative only. However, it is clear that here the proportion of deadweight (around 25 per cent represented by the seven firms which carried on their projects anyway) is significantly higher than the 4.6 per cent observed for Phase 1 (Table 26). The level of complete i.e. total additionality is also marginally lower here in Phase 2 with 10 out of 27 projects stopping completely here (37.0 per cent) compared to 51.2 per cent in Phase 1 (Table 26). The implication is that the degree of additionality is greater in Phase 1 of the SBRI scheme than in Phase 2. An important caveat here again relates to the number of Phase 2 applicants included in the respondent group which suggests this observation should be regarded as indicative rather than definitive.

Table 28 Outcomes where Phase 2 project applications were rejected

	Non-winners (Number)
A. Project outcomes	
The project stopped completely	10
The project continued in exactly the same way	7
The project continued but was modified	10
(Don't know/Refused)	
Total	27
B. Project changes where continued but was modified	
Proceed, but with a delayed start	3
Proceed, but more slowly than it would have done with SBRI support	3
Proceed, but with less of your time or resources invested	3

(Sources: Company survey data, Phase 2 non-winners only.)

² Test statistics were as follows: for formalising the technical objectives of the project, $\text{Chi}^2(1) = 0.7520$ Pr = 0.386; for giving the proposal more detailed consideration $\text{chi}^2(1) = 0.0865$ Pr = 0.769; and, finding the application process complex, $\text{Chi}^2(1) = 0.3958$ Pr = 0.529.

Turning then to those Phase 2 projects which were awarded, how did these perform? Again it is necessary to remember here the relatively small number of survey respondents. In around seventy per cent of cases (13 firms) the Phase 2 project achieved all or the majority of its objectives (Table 29), a marginally lower proportion than Phase 1 (Table 27). Where projects failed to meet their objectives the evaluation survey provided little clear evidence on the main reasons for this with a range of justifications being provided.

Table 29 Achievement of Phase 1 objectives: Phase 1 and Phase 2 winners

	Number	%age
Phase 2 achieved all of its key objectives	4	22.2
Phase 2 met the majority of its objectives	9	50.0
Phase 2 met some of its objectives	1	5.6
Phase 2 met none of its objectives	0	0.0
(Don't know/Refused)	4	22.2
Total	18	100

(Source: Company survey data, Phase 2 winners only.)

3.3.7 Observations

A number of contrasts are evident between the group of SBRI applicants over the 2011-12 period and the broader population of UK firms:

- Compared to the UK firm population, small firms (10-49 employees) were under-represented in the applicant group from 2011-12 with larger firms (250 plus) significantly over-represented.
- Applicants were concentrated in Information and Communication (29.6 per cent), professional, scientific and technical activities (26.3 per cent) and administrative and support service activities (12.5 per cent). Each of these sectors is significantly over represented in comparison to the UK population of firms. The proportion of applicants in manufacturing (8.8 per cent) and healthcare (8.7 per cent) were broadly in line with the population proportions.
- SBRI applicants are concentrated among larger firms and in sectors where firms are likely to be more innovation active than the UK norm. This suggests the applicant group differs markedly from the general population of enterprises.
- SBRI applicants are slightly younger than the business population as a whole, although the majority of applicants remain mature firms;
- SBRI applicants have a much better qualified workforce than non-applicants – nearly twice as many SBRI applicants have a 50 per cent graduate workforce as non-applicants. This reinforces the observation made earlier about the above average innovation orientation of SBRI applicants.
- SBRI applicants have a much greater knowledge about government supports for innovation and R&D than non-applicants. Only around a quarter of non-applicants were aware of SBRI.

In terms of firms' progress through the scheme three main conclusions emerge. First, firms generally find the Phase 1 and Phase 2 application processes helpful and constructive. Second, where support is provided either through Phase 1 or Phase 2 funding, the vast majority of firms report achieving all or most of their objectives. Finally, relatively few SBRI funded projects (4.6 per cent in Phase 1) would have proceeded unchanged without SBRI support; a further 39 per cent proceeded but either reduced in scale or delayed. In operational terms the scheme appears to work well therefore with overwhelmingly positive company feedback and what seem relatively high levels of additionality in Phase 1 support. Conclusions in relation to Phase 2 support are tentative due to small respondent numbers but here too additionality seems high.

3.4 The Target Setting Process

3.4.1 Target Setting

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 over £100m in 2013-14 and over £200m in 2014-15. Those departments were the following (with their 2013-14 target in brackets): the MOD (£50m), the NHS (Health) (£30m), Department for Transport (£7m), The Home Office (£7m), The Department for Energy and Climate Change (£3m) and the Department for Food and Rural Affairs (£3m). The decision was taken in HM Treasury and correspondence from the Cabinet Office to departments indicates that the target was communicated by letter to departments. The Government also indicated its policy in the Appendix to the House of Commons Science and Technology Committee in the summer of 2013 (24):

“The Government recognises the importance of effective Government procurement in fostering innovative SMEs. The Government announced in Budget 2013 that it will substantially expand the Small Business Research Initiative (SBRI) programme among key departments so that the value of contracts allotted through this route increases from £40m in 2012-13 to over £100m in 2013-14, representing 0.25 per cent of procurement budgets, and rising to over £200m in 2014-15, representing 0.5 per cent of procurement budgets.”

The target was one of two approaches the government took in response to the Select Committee's assertion that more should be done to promote the programme, as part of an attempt to support SMEs. The other step which the government took to promote the programme was to require all departments to ensure that their SME action plans identified how departments should make more use of SBRI (24, page 9). A small number of SME action plans that the study team have reviewed suggest that such plans were not especially detailed and, in the case of the MOD, the SBRI programme is not referred to.

The context in which the targets were published and were intended to take effect was a difficult one. Departments were simultaneously required to make long term savings on procurement including through a simplification approach. The Spending Review (2) also noted the need for economies in procurement:

“1.54 Central government will save around £1 billion in 2015-16 by centralising the purchase of common goods and services through the Government Procurement Service, negotiating better deals with suppliers and making better use of IT. The Government will also accelerate progress towards using digital technology as its principal channel for doing business (digital by default) and adopt new commercial models for service delivery, saving £800m.”

The effect of such targets for savings may impact upon the ability of departments to implement and operate the SBRI despite the fact that SBRI may allow departments to save costs in the long run. There is

no clear strategy within departments on how SBRI can contribute specifically to the realization of the major aims of the government's austerity programme.

That said, departments are spending significant amounts of money through SBRI. One department, DECC, has exceeded its target. Its average spend over the last six years exceeds the target by £2.5m. However, during 2014-15, it has fallen well short of its target of £6m, although the data for the current year is not complete. Other departments have not yet managed to reach their target and most fall a long way short, although some data relating to MOD competitions is currently unavailable and therefore we cannot make a reliable assessment of MOD performance. The following table shows that the current target for departmental spending through SBRI is £100m, but the average annual spend of all of the target departments (over the last six years) is around £18m. Currently, amongst those departments that do not reach the target, the overall average annual spend for target departments is around 1/6 of the target, with DfT's the lowest proportion at 1/25, and the highest being DEFRA 1/6. Column 9 indicates the SBRI departmental expenditure as a percentage of the overall gross procurement budgets.

Table 30 Departmental SBRI Use, Gross Procurement and SBRI Share

<i>Departmental SBRI Use, Departmental Gross Procurement and SBRI Proportion of Gross Procurement</i>											
PSB (Target Depts. in Bold)	SBRI Contract Values Phase 1 and Phase 2 (£000) by year						Gross Procurement Budgets 2012-2013 (£billion)	SBRI Spend as Proportion of Gross Procurement Budget (Gross Budget / 6 year average)	SBRI 6 Year Average Spend (£m)	Target for 2013-14 (£m)	Target for 2014-15 (£m)
	2009-10	2010-11	2011-12	2012-13	2013-14 (Target Year 1)	2014-15 (Target Year 2)					
DH	£5,113	£0	£0	£1,123	£10,319	£0					
NHS	£1,153	£2,754	£1,466	£1,754	£9,758	£2,524	£55	0.01%	£2.9	£30	£60
MOD	£6,141	£5,581	£14,291	£6,572	£9,672	£1,036	£12	0.06%	£7.2	£50	£100
DfT	£300	£0	£0	£0	£150	£1,220	£2.1	0.01%	£0.28	£7	£14
HO	£1,080	£288	£859	£554	£925	£1,296	£2.0	0.04%	£0.83	£7	£14
BIS	£0	£491	£498	£1,178	£2,505	£0	£1.1	0.07%	£0.8	NA	NA
DECC	£0	£1,941	£0	£6,758	£24,190	£0	£1.6	0.34%	£5.5	£3	£6
DEFRA	£0	£1,277	£405	£1,183	£549	£0	£1.3	0.04%	£0.57	£3	£6
Innovate UK	£15,885	£200	£1,884	£19,798	£9,843	£8,839					
DAs	£0	£81	£0	£774	£562	£2,238					
FSA	£0	£230	£190	£504	£0	£0					
OS	£0	£181	£0	£0	£0	£0					
NC3Rs	£0	£0	£3,496	£1,176	£2,812	£5,645					
DWP	£0	£0	£0	£0	£0	£0	£2,106				
EA	£0	£0	£0	£478	£0	£0					
UKSA	£0	£0	£0	£1,022	£5,084	£0					
IPO	£0	£0	£0	£200	£0	£0					
RCs	£0	£0	£0	£280	£800	£0					
PCP	£0	£0	£0	£0	£484	£685					
Total	£29,672	£13,024	£23,089	£43,354	£77,651	£23,483					

(Source: Innovate UK data on SBRI Contract Values; ONS/HM Treasury (2013) Public Spending Statistics July 2013 for Gross Procurement Amounts; SBRI Proportion derived by study team from Data Supplied by Innovate UK; DH and NHS total an proportion considered as one target; some DECC areas have moved from DEFRA)

Note ¹ Target Departments DH/ NHS, MOD, DfT, HO, DECC, DEFRA.

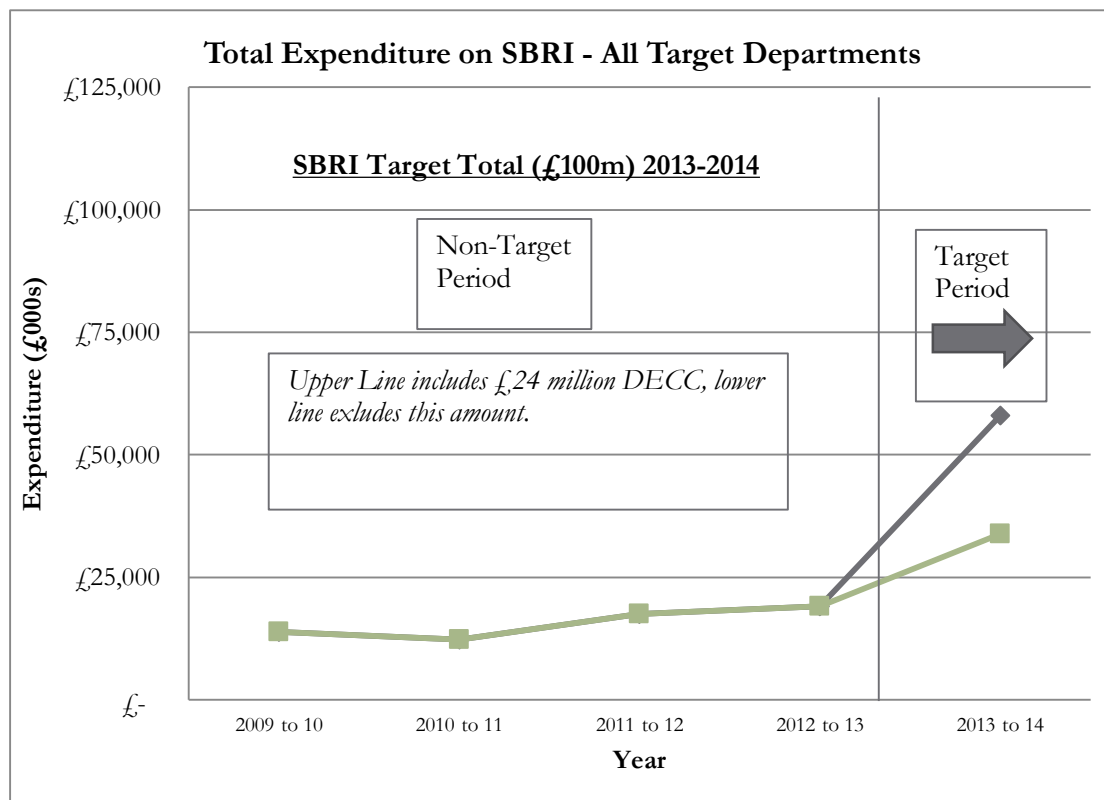
3.4.2 Changes Resulting from the Target

The study team sought evidence of changes resulting from the target from two main sources: changes recorded of programme use, and changes to the behaviour and attitudes of departments. We present both types of the evidence we have collected below and comment on it. We begin with the actual usage of the programme which has been obtained from the SBRI programme management data. Then we cover the views and attitudes of departments which were obtained from interviews with departments, Innovate UK, and other informants.

Programme Usage: Financial Perspective across Target Departments

We reviewed the data from the actual departmental spending on the SBRI programme over the last period and reviewed the expenditure across the departments directly affected by the target. This showed that in the period after the target began, spending rose significantly, although as the earlier table confirms (Table 30), the amounts spent through the SBRI programme were well short of the proportion expected.

Figure 11 Total Expenditure on SBRI – All Target Departments by Year

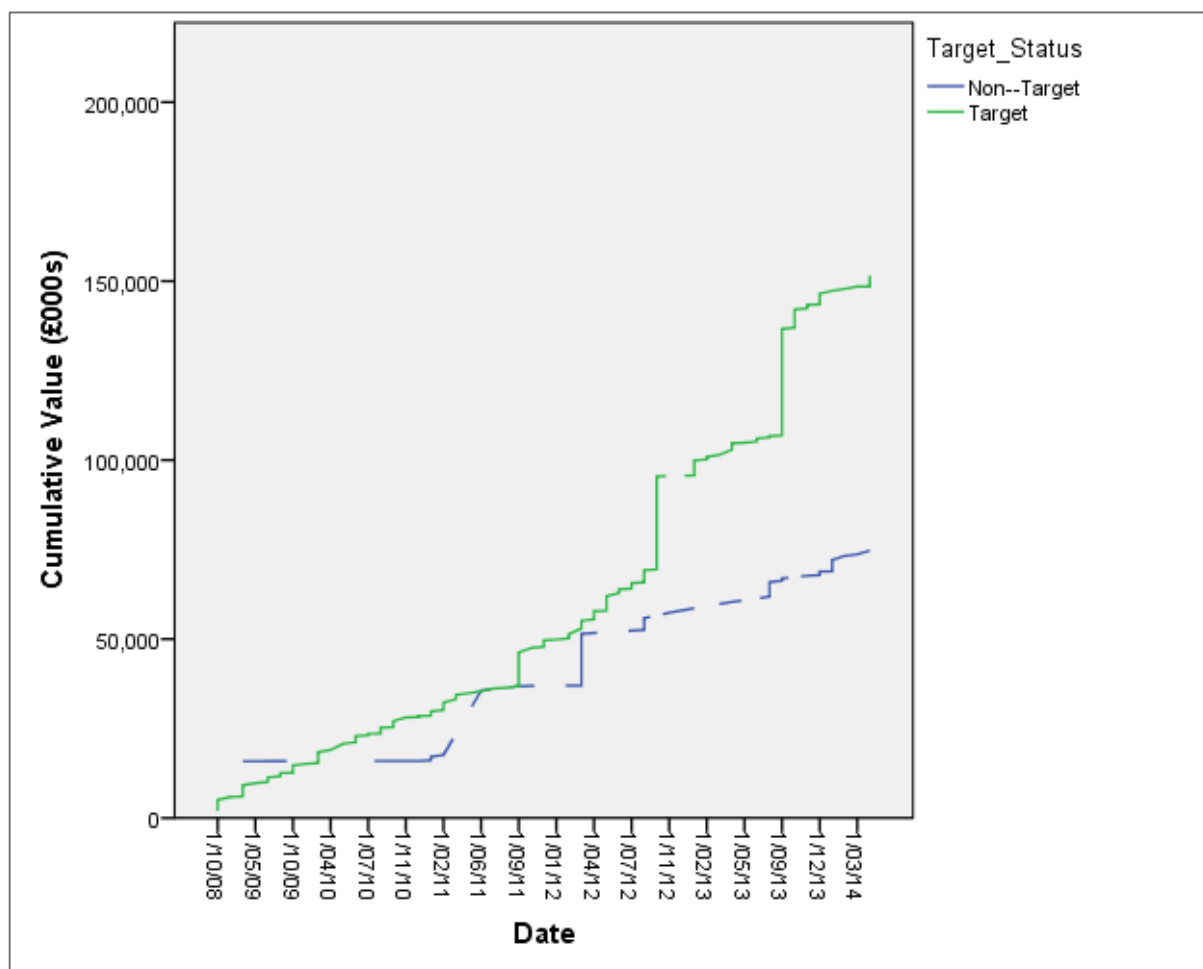


(Source: Innovate UK Data)

The Target non-Target Department Comparison

The next figure, Figure 12 Target and non-Target Department Comparison, provides a comparison between the non-target and the target departments in their use of the programme. A cumulative graph of contract value is shown. This shows the importance of the target departments to the programme – they account for around 66% of the expenditure. The non-target departments are not increasing their use of the programme at the same rate as the target departments. Major increases in use occurred in both 2012 and 2013. As we have noted in the figure above, certain large procurements such as the DECC SBRI challenges can have a major influence upon the overall amounts.

Figure 12 Target and non-Target Department Comparison



(Source: Innovate UK Data, Analysis by study team)

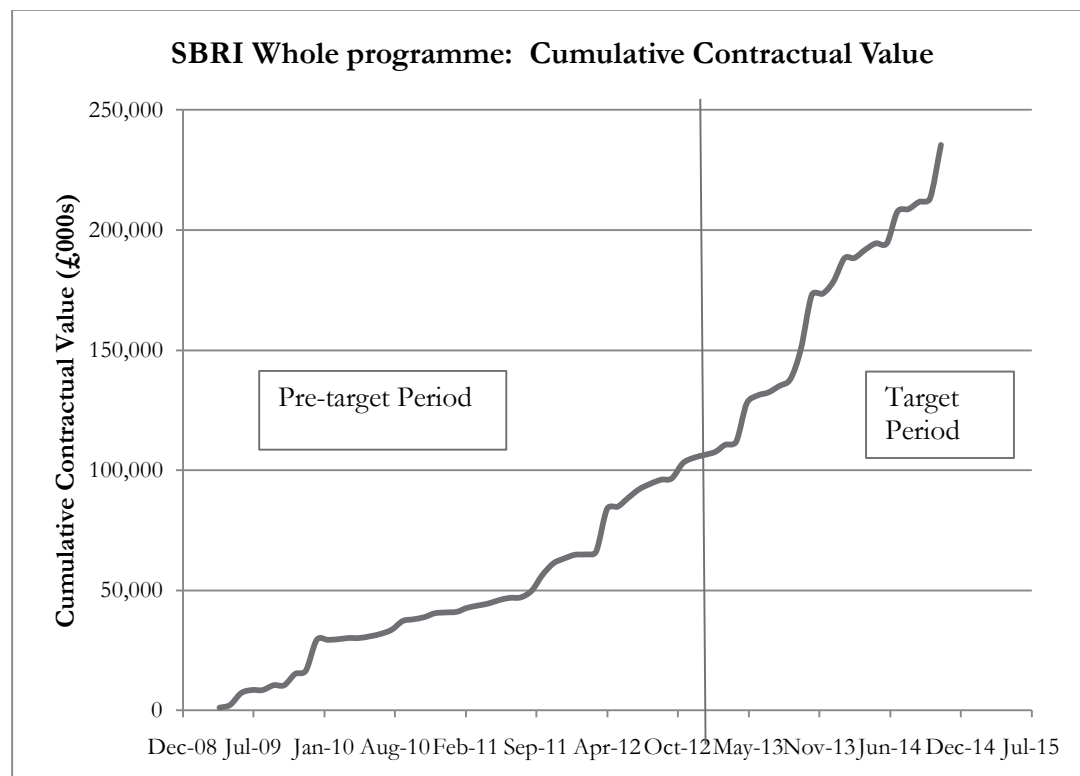
Programme Usage: Financial Perspective across the Whole Scheme

Earlier in the report we presented an analysis of Innovate UK’s own data concerning the amount of SBRI resource spent on competitions. This was shown in the earlier figure (Figure 10 Value of contracts awarded according to years December 2008 – July 2014). The data is drawn from the management spreadsheet which is maintained by the SBRI programme. This data used in this analysis covers the period until 2014 where we have confidence in the reliability of the data. This shows some increase towards the end of the period in the amount of money committed to the programme but the increase is very small and would not appear to provide the evidence of a major impact upon the rate of use of the programme from the target or from any other influence.

Data provided in a later version of the SBRI programme data given to us by Innovate UK includes competitions to a later period ending in November 2014. Innovate UK is certain as to the reliability of information but not its completeness. However, we have examined this information (which is to later date – and which is more recent) and we observe the following. The amount of money spent on competitions through the programme remains relatively constant. Even considering this most recent data, any rate of increase in the use of the programme appears small.

Across departments affected by the target, the picture is mixed with some departments relatively unchanged in their use over the whole period and following the target period (MOD, DEFRA) while other departments have grown their use of the programme significantly. This group of departments that has increasing use comprises: DfT, NHS/DH, DECC and HO.

Figure 13 SBRI Cumulative Contractual Value

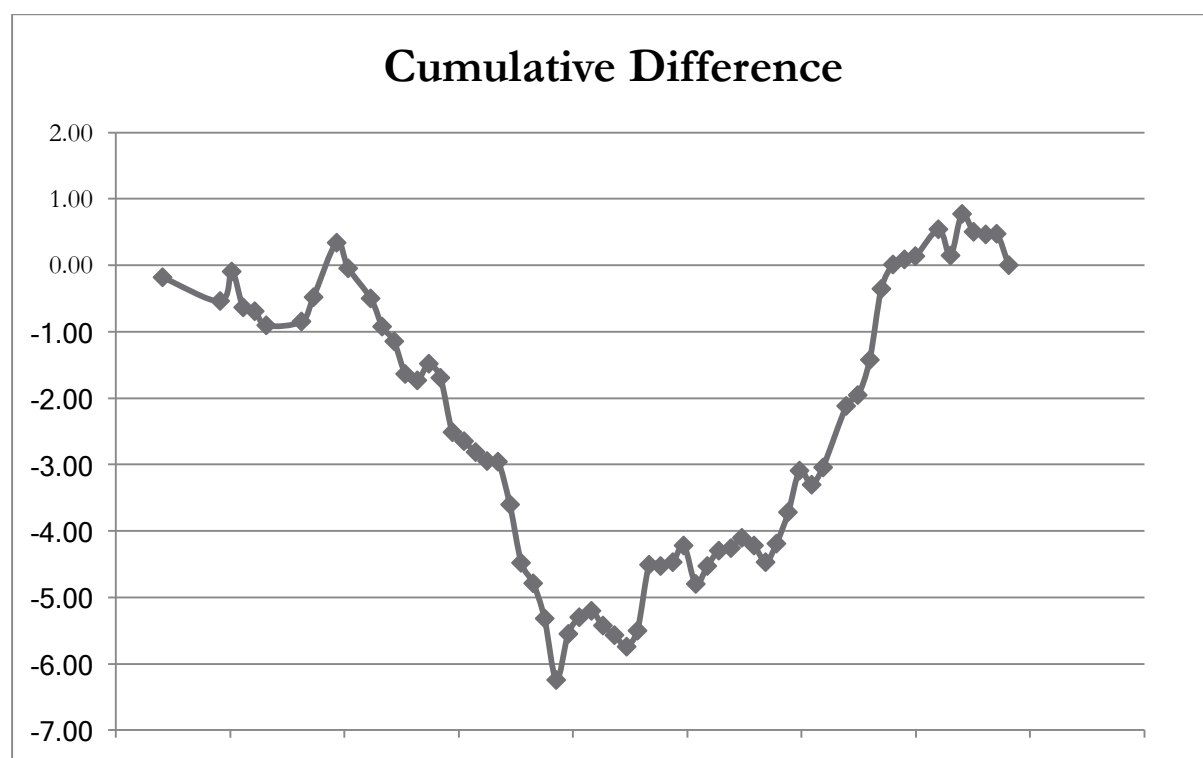


(Source: Innovate UK Data)

The SBRI Programme – Historical Analysis

The study team used a Cusum analysis to review the historic data of programme operation to detect changes in use. A Cusum analysis was used as the technique is robust and is capable of detecting and identifying very small changes in the operation of a process. Programme data for total contract value (Phase 1 plus Phase 2) competitions was normalized and subject to the Cusum method. Our analysis suggests two things: a) at the start of the programme, the pattern of use was very similar over a long period until around September 2011 when the value of contracts awarded began to rise. Taking the data from the cumulative chart and the Cusum together suggests that an important change occurred in programme usage during 2011 and that more recently usage has increased slightly but not significantly.

Figure 14 Cusum Total Contract Value Awarded (Innovate UK Data set)



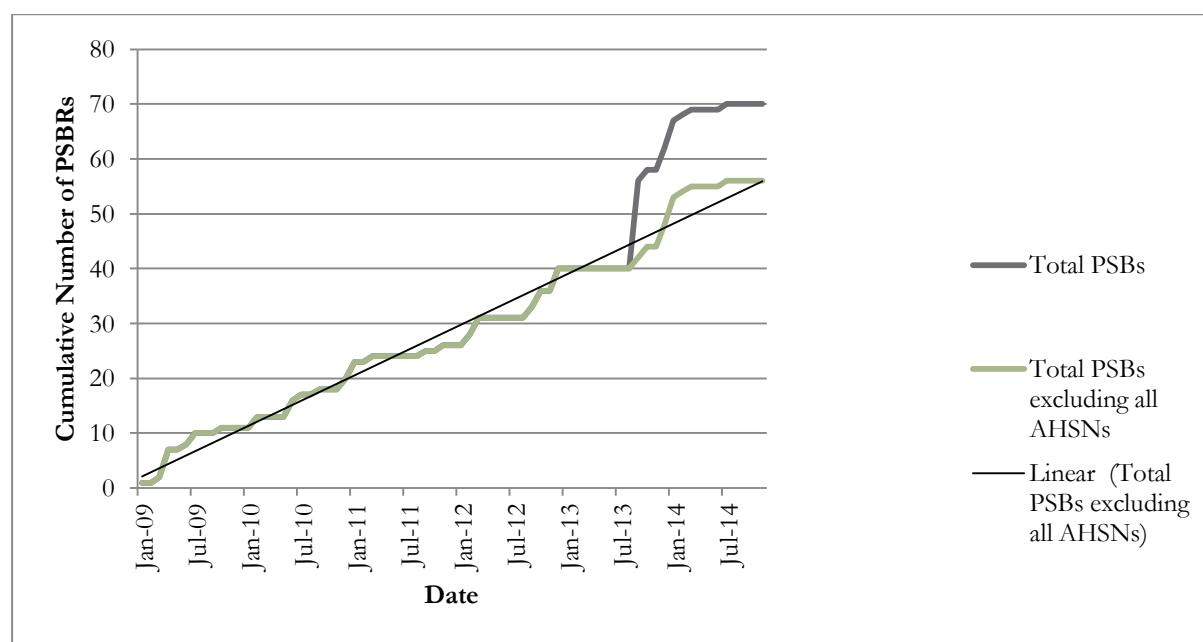
(Source: study team Analysis, Data Innovate UK)

Programme Usage: Count of Public Sector Bodies

We also examine Innovate UK data concerning the number of public sector bodies using the SBRI programme. Below we show the cumulative count of public sector bodies using the programme. We conduct this analysis to determine if government departments and other public sector bodies are influenced by the introduction of targets on a core group of large departments.

Analysis of this data shows a rise in the number of organisations using the programme. The data shows that this rate of increase is slow and steady in the period up until 2013. At that point, the Academic Health Science Networks begin to use the programme. This causes the line of the total number of public sector bodies to rise steeply. Our figure shows both the total number of public sector bodies and the total number of PSBS without the AHSNs included. The inclusion of the AHSNs in the total leads the overall curve to rise steeply, while the total that excludes them continues to grow at the original rate. The evidence suggests that the setting of the target may have had some effect upon the use of the programme by the health organisations (DH, NHS – the related AHSNs) but not by other organisations.

Figure 15 Cumulative Count of Public Sector Bodies Using the SBRI Programme



(Source: Innovate UK Data)

We may conclude that part of the increase in the use of SBRI has been attributable to a greater number of public sector bodies using the programme. There is however re-use of the programme by departments with MOD re-using SBRI 20 times per year, NHS every year for 5 years and NC3RS every year for 3 years.

We discuss elsewhere the role played in supporting departmental (and other public sector body) use of the SBRI programme by additional support from Innovate UK. This co-funding by Innovate UK has been an important feature of the use of the programme in that it has formed a substantial part of the money allocated to competitions. The degree to which Innovate UK money has been able to leverage departmental money into the SBRI competition is difficult to determine, but our view is that this spending is likely to have had some effect in helping departments raise their own spending on the programme, and hence it has helped them achieve the target. Whether this support of departments to achieve targets is desirable or practicable are difficult questions. Clearly, there may be competitions that might need the involvement of Innovate UK as a technical partner. But it is perhaps less justifiable that Innovate UK should in effect subsidize departmental use.

Departmental Attitudes to Targets

The target for the use of the SBRI programme was intended to increase the use of the programme amongst government departments (the target departments) but also to change attitudes about the use of the programme. We undertook interviews in the main target departments but also contextual interviews and interviews with firms and with Innovate UK.

The creation of the target has given the SBRI programme greater visibility in government. It has made departments more aware of the procurement of innovation agenda generally, and of the possibility of realizing benefits for departmental policy and operational objectives from the programme. The generally

very positive views held by departments about the management of the programme by Innovate UK and the programme's relative ease of use have further encouraged a positive approach to the programme on the part of departments.

However, overall, the target departments have felt that the effect of the targets set has been negative, although the targets have led to an increase in use. Resistance to targets arises from the process of implementation of the targets which, in the view of departments was done without sufficient consultation. Departments did not have time to develop through either consultation with Innovate UK or internally a realistic understanding of how SBRI could be extended and how the larger targets could be met. Most of the (target) departments consider that the target corresponds to a proportion of their procurement budget. However, for many departments (target and non-target alike), procurement does not have a budget and/or the money for SBRI does not come from procurement.

It is important to note that departments (both target and non-target) are not opposed to the setting or presence of a target per se, but stress the importance of having targets that are reasonable and achievable. Many would welcome a consultation process for target setting. It was noted by one respondent from DfT that departments have a target for SME engagement that has been set via a consultation process and SBRI Targets have involved reference to SME usage.

3.4.3 The Effectiveness of the Target

We considered if the target setting process had been effective in increasing use of the programme and in changing attitudes and capabilities within departments to use the programme.

Firstly, we should note that an effective target relies upon a defined owner of the target and upon the existence, implied by the term "target", of some form of sanction if the target is not met. At present, departments do not have clear ownership of the programme, nor is there a clear penalty if the target is missed. SBRI champions within departments with the exception of the SBRI Healthcare programme (DH and NHS) and DfT are not senior staff and have no programme office or permanent budget. For SBRI to become one of the tools of choice for the development of organisational improvement (through operational competitions) or for policy purposes (through policy competitions), the SBRI programme needs greater recognition within departments and those departments would benefit from greater capability in how to use SBRI.

Amongst non-target departments, a number of respondents indicated that a target for them would not be unwelcome as it might increase the use of SBRI within their departments and create the justification to ask for additional funding and promote the view that innovation should support the work of government. However, this view was given cautiously, with the reservation that targets should be realistic, feasible and achievable.

It was suggested by one department that an SBRI target should operate on a three year basis and non-annually. This might reduce further the risk of departments attempting to game the system which could lead to competitions that represent a waste of resource.

3.5 Data Collection and Management

3.5.1 Information Generated in the SBRI Programme

Information is generated at various stages within the SBRI process. In the following table we identify the information and the party responsible for collecting the information. Our view of the information generated within the programme has been developed from interviews with Innovate UK and with Departments.

Table 31 Information Management in the SBRI Process

<i>Information Type</i>	<i>Innovate UK</i>	<i>Department</i>
Decision on performance specification and justification of the Challenge and Competition	Held by Innovate UK if Innovate UK led	Held by Department
Applicant firms by Competition at Phase 1	Totals only, no company information	Held by Department
Phase 1 Evaluations	Location unknown	Location unknown
Phase 2 Evaluations	Held by Innovate UK if Innovate UK led	Held by Innovate UK if Innovate UK led
Phase 1 Feedback	Location unknown	Location unknown
Phase 2 Feedback	Location unknown	Location unknown
Contracts Phase 1	Held by departments when procurement led by Department	Held by departments when procurement led by Department
Applicant firms by Competition at Phase 2	Totals only, no company information	Held by departments when procurement led by Department
Funding Allocation Data for Phase 1	Totals only, no company information	Held by departments when procurement led by Department
Funding Allocation Data for Phase 2	Totals only, no company information	Held by departments when procurement led by Department
Phase 1 Contracts	Held by Innovate UK if Innovate UK led	Held by departments when procurement led by Department
Phase 2 Contracts	Held by Innovate UK if Innovate UK led	Held by departments when procurement led by Department
Reports of Firms at Phase 1	Held by Innovate UK if Innovate UK led	Held by departments when procurement led by Department
Reports of Firms at Phase 2	Held by Innovate UK if Innovate UK led	Held by departments when procurement led by Department
Phase 3 Outcomes	None collected	None collected
Phase 4 Outcomes	None collected	None collected
IPR Generated	No formal records	No formal records

(Source: *Innovate UK and Departmental Interviews*)

The information generated within the programme is used for a variety of purposes. Much of the information is management information which is used to support the process of application and competition. However, other information is relevant to the assessment of the performance of the programme in terms of the effectiveness of its processes and the scale and reach of its impacts. The information management standards (e.g. ISO 9001, ISO 27001³) are currently in use for the programme.

The study team note the Government's view in 2013 about the data held about the programme and expressed in the Appendix to the Select Committee's Report. In its reply to the Select Committee, the Government argued that the collection of data that would make it possible to determine if SMEs had

³ 27001:2013

succeeded in obtaining a greater proportion of Government contracts was not Government policy, as the numbers of firms involved were large and the difficulties of identification significant:

“Paragraph 32. We recommend that the Government, in two years, publish a breakdown of companies successful in tendering for Government contracts and compare whether greater openness in procurement has resulted in increased contracts among small and developing British technology companies. (Paragraph 174)

Transparency is at the heart of Government's operations. This includes publishing information about the way public money is spent:

- all central government contracts over the value of £10,000 are published on Contracts Finder
- the Government has published information on its spend with SMEs.[6]
- the TSB has created a searchable database which has been available since mid-November 2012.[7]

This contains details of all SBRI contract recipients, where the TSB is the contracting authority. The Government does not, however, believe it is possible to publish information as the Committee recommends given the number of contracts awarded and the difficulties of identifying small and developing British technology companies.”

Against this background of a limited remit for information collection, the programme has developed a number of what might be termed “blind spots” identified above in the Table 31. Firstly, there is no single record of SBRI applicants nor is there a single record of winners. Within departments (when departments run competitions), there are different (i.e. non-standardized) approaches to data collection and management. Furthermore, departments are not under an obligation to provide the information about applicants or winners to Innovate UK, and no general practice of doing so for monitoring purposes exists. Information provided by departments to Innovate UK is limited to summary data which includes the number of applications and the value of competitions and the dates of competitions.

3.5.2 Data Management Requirement

Record keeping and secure information management are an important part of the SBRI process for a number of reasons:

- a. commercial confidentiality;
- b. information security (some of the procurements may involve the security services);
- c. outputs of competitions are important to the functioning of UK Government and have important commercial value;
- d. government has a responsibility to carry out due diligence and financial reporting which can only be supported by well-organized documentary and business processes;
- e. evaluation of minority participation in society (e.g. LGBT monitoring, SME targets);
- f. evaluation of the operation and effectiveness of the SBRI programme.

While data appears securely stored, not all the data that might be acquired about firms and competitions is in fact collected in a consistent format, and what is collected is not readily available. The demonstration of the SBRI programme relies upon reliable information about outputs and participation of firms.

Information about the identity of firms is particularly important to determine the extent of repeat use of the programme by certain firms. In the US SBIR programme, there has been concern expressed over the

repeat use of their SBRI programme by a small number of firms that win many awards but do not commercialize their inventions. While this problem is overstated in that the number of so-called “SBIR mills” is low, (25, page 105), and those firms which are frequent users of their programme are economically successful as well as meeting the needs of the government, there remains concern that repeat use is a feature of programme operation that should be monitored. Whether the UK should continuously monitor or monitor this from time to time is an issue that should be urgently addressed. The lack of an information system / customer relationship management system (CRM) for management and evaluative purposes is a significant deficiency of the programme. If such a system were implemented, it would not be difficult to extend it to ensure that individual company involvement in the programme was recorded.

4.0 Findings: The SBRI Process

4.1 Challenges Formulation and Overall Programme Design

4.1.1 The Experience of Public Sector Bodies

Public sector bodies are key actors in the SBRI Process. They define a challenge that has a number of aims: in the case of operational competitions, challenges must meet the needs of departments, but to do so in a visionary way with technologies that do not yet exist (otherwise the acquisition could occur through normal procurement processes that do not involve a research stage); in the case of policy competitions, challenges must address the policy needs of the department which may include the needs of a wider public or private sector client (and to this extent, the department acts as a proxy customer). At the same time, the challenge should support firms, and, as the SBRI programme seeks to support the UK's SME sector, this sector should be a primary beneficiary.

Departments have not generally operated on their own in selecting challenges and implementing competitions however. In selecting challenges (and the later stages of the programme the implementation of the competitions) they have been assisted by Innovate UK. Before the SBRI operated in its current form, several departments already had a needs definition route and thus for them, the new SBRI is another (powerful) tool within their portfolio to approach their innovation challenges, although in the case of the SBRI the needs are expressed in the form of a "challenge".

For some departments, SBRI provided a new way of thinking about approaching innovation challenges, which they had previously not done before. Awareness of (the existence of) SBRI in the various departments was high, however the extent to which the value and benefit of the programme was understood (and thus utilised) was more varied. Particularly in the target departments, a lot more activity had to be undertaken to make people understand the actual process, to realise the benefit of using it (or at least think about using it), and how to integrate it into their current thinking.

Overall, for all departments, the SBRI has had the important and useful outcome of triggering more strategic thinking about their operational and policy objectives, and creative ways in which these problems might be solved. However, this does not always translate into a higher usage of SBRI as the issue of money to fund the competitions is still a crucial one (see below). And more importantly, while there is more strategic thinking about procurement of innovation for operational or policy purposes, the role of the SBRI is not necessarily being considered at the highest levels in departments or other public sector organisations.

One of the differences in the treatment of SBRI in various departments is the overall responsibility of SBRI. For some departments, SBRI comes under the remit of the procurement/ commercial directorate (even though many of the procurement functions do not have a budget) while in other departments, SBRI may sit under other directorates, e.g. economic growth (Wales), innovation or policy teams. For some, the delivery of SBRI can be the responsibility of more than one person/ function. We observe that in most cases there is no overall *ownership* of the programme/ scheme to take it forward (and champion it). This has been particularly the case for target departments who often ask the question "who's responsibility is it to meet the target?" DH / NHS and Defence are departments where SBRI has a high level of recognition and where there is strategic use of the programme. Elsewhere, decisions about using SBRI are not considered systematically, against all policy and operational requirements a department may have and against all the other options (i.e. normal procurement, forward commitment procurement, R&D contracts, R&D grants, participation in European Union procurement projects).

Almost all the departments interviewed commented very positively about the support that the SBRI team at Innovate UK provided. This was particularly useful at the beginning when departments were just starting out using SBRI, and allowed them to gain confidence to take over and handle subsequent competitions on their own. Innovate UK support was also vital in terms of advertising the competitions and finding the right people for evaluation panels, particularly through access to their KTNs. However, a small number of respondents felt that the team was perhaps under-resourced and overworked. This was related to the fact that while help was always provided when needed, sometimes it was very difficult to get hold of people in a timely manner when queries arose.

Many departments also felt that it would be useful to give more notice to industry of the programme itself (rather than impending calls) although this was not a view that was supported by firms. The approach in SBRI Healthcare context where the attempt has been made to operate the programme on a biannual cycle, with challenges published at the same time each year, twice yearly, may improve the programme's visibility.

We noted in our departmental interviews and our cases that the amount of time required of departments particularly at Phase 2 was stated to be larger than expected. Given the relatively small number of challenges that have been conducted, it was not surprising to hear this; but it may also signal that departments are not yet certain how large their commitment to SBRI should and can be.

Departments believe that the need to commit resources one financial year at a time could lead to the timing of competitions being unhelpful to small firms with cash flow problems. This problem cannot be addressed by changing the programme as such but by improving departmental budgeting arrangements. The specific difficulty is that there may be occasions when there is uncertainty over budgetary amounts for competitions and uncertainty over the start dates.

4.1.2 The Experience of Firms

The challenge approach (especially where the stakeholder community suggest challenge areas) implies that some of the market research has already been done to some extent, thus it should be attractive to participating firms – it is also attractive to departments in assessing and addressing broader policy goals. SBRI also draws in firms that may not have been involved in the specific research field covered by the challenge and who have not hitherto recognised that their research might find application in this particular area. Thus it stimulates cross-sectoral fertilisation.

The approach helps to avoid path dependency and silo effects within the solutions market. One company noted that a real benefit of the SBRI approach was that the sponsor has a problem and looks for the solution; they don't define what that solution should be (Case Study 2) and this view was endorsed by a sponsor department (e.g. Case Studies 7, 8). At least one SBRI project has led to a coalescence of the sector community by providing an exemplar of how this sort of project could be done. In turn, the project raised additional issues of broader legal and policy interest and, more broadly, increased the sponsoring agency's knowledge of other related activities going on in the area and provided significant cross pollination (e.g. Case Studies 3, 4).

The pre-competition workshops tend to strongly encourage collaboration and cross-fertilisation since it is clear that a broad range of complementary areas of expertise will be required for some of the solutions. There are examples where Innovate UK and the sponsor agency/department try to steer promising projects towards other forms of support or to facilitate some sort of partnering, especially with academics.

The fact that the firm is able to retain their own IP was a "real deal maker" for many firms and an extremely important aspect. One firm commented on the disproportionate nature of the contract and the

poor protection of IP which was a consequence of using a hospital as an intermediary in the competition (Case Study 7).

Some participating firms felt that SBRI provided the only mechanism by which this type of project, i.e. an innovative procurement, could be supported apart from some much larger and complex EU initiatives. This was certainly seen as the case in the area of open source programming where open systems for collaboration are required (Case Study 5). Another positive feature is that SBRI confers greater autonomy for firms to employ sub-contractors – it is very flexible and less rigid than other Innovate UK funding schemes (possibly as a consequence of it being a contract rather than a grant); highly innovative firms don't want the risk of putting additional staff on the payroll over a short-term contract period. The 100% funding, with no match funding conditions, was also seen as particularly attractive and is, as far as the participant was aware, the only UK scheme which offers this (Case Study 11).

4.2 Competitions – Phase 1

4.2.1 The Experience of Public Sector Bodies

The proposal reviewing process can be quite resource-intensive for the sponsor department, especially if the number of potential applications is initially unknown. For example, Case Study 2 reported that it had been difficult for the sponsoring department to recruit sufficient knowledgeable reviewers, on a voluntary basis, to deal with the large number of applications received, although it had managed to accomplish the task. The review process varies across the programme, Innovate UK paying assessors and other departments choosing to use volunteers. There is therefore diversity in how the reviewing process operates. If paid reviewers are not employed, it is essential to have a significant level of 'buy-in' from broader industry and other stakeholders to make the application process work effectively.

Phase 1 competitions can sometimes be used alone i.e. without recourse to a Phase 2. A small number of competitions are Phase 1 or Phase 2 only. It is difficult for the study team and also Innovate UK to be certain about exactly how much of the programme overall is single phase (i.e. Phase 1 only or Phase 2 only) as MOD has not provided all the information about its own Phase 2 competitions. MOD has provided data on its Phase 1 competitions and Innovate UK indicated that there may well be significant use of Phase 2 competitions by MOD. DEFRA has also used Phase 1 only competitions four times over the period of the programme's operation since 2009. Phase 1 only competitions are operated when departments have specific feasibility study needs and the feasibility of such technological development cannot be determined at that stage. Being able to conduct Phase 1 only challenges is a useful feature of the programme as, if a Phase 1 competition results show that a particular technology is not feasible, then a Phase 2 competition does not need to be run. In some instances, a Phase 2 is anticipated when a Phase 1 competition is run, but in some instances, the Phase 1 competition may be operated without any intention to continue to Phase 2.

4.2.2 The Experience of Firms

Our interviews with firms provided evidence that the duration and funding level for Phase 1 was about right, and that there was no need to change the amount of time or to introduce flexibility in duration. The relatively short period of Phase 1 is considered useful combined as it is with immediate flow of funds from the programme as it reduces the element of risk faced by small firms. One firm did consider that (Case Study 2) had raised the possibility of introducing a micro-Phase 1 to reduce the risk.

Achieving a balance between being innovative and meeting the specific goals of the challenge can be quite difficult. In this regard, the openness and flexibility of the challenges briefs developed so far appear to allow a highly flexible approach and favour highly innovative solutions (e.g. Case Studies 8, 11). While it was noted that the broader specifications of the brief were less favoured by some larger firms (especially

those in the defence sector (Case Study 4) who preferred a more rigorously specified approach, the smaller firms enjoyed the freedom and the broad targets and vision conveyed by the open specification. There is some evidence that firms are both responding to the brief and using the programme as a way of further developing technology they have already developed.

4.3 Competitions – Phase 2

4.3.1 The Experience of Public Sector Bodies

Phase 2 is a longer period of time and provides far greater opportunity for the development of the technology or service and this involves closer cooperation between the department and the firms in the competition. It was noted therefore that for certain categories of product, notably software, overall funding levels might lower and that at Phase 1 sufficient progress might be made that a Phase 2 competition might not be necessary or would not need such a large amount of resource as would normally be the case (Case Study 5).

The issue of budgetary timelines was also noted in Case Study 7. Challenges need to operate over a long period, however, if the sponsor department (in this case, NHS) runs on annualized budgets, so a Phase 2 can generally only last one year, although there may be overruns. There can also be no commitment to run a Phase 2 after a Phase 1. In some cases it would be better to run the Phase 2 over two years, but this is not possible in the NHS which can only normally give a financial commitment one year at a time. For the development of Class 2 or 3 medical devices the SBRI timeline is thus too short to get all the way to a product. A three year budget commitment for competitions would be ideal, although this was recognised as an NHS-related problem, not an SBRI programme problem.

4.3.2 The Experience of Firms

SBRI projects were generally felt to be very clear and well-defined; little paperwork is required and the proposal format is clear and straightforward, as are the reporting requirements (most Case Studies). The application process was very quick and, after acceptance, the contract was (in most cases – see below) issued quickly. Capping the length of the application was useful in minimising the administrative and assessment work although some firms noted that they would have liked to have been able to provide more supporting information (Case Study 4). Overall, financial processes were seen as very fast although one company did encounter cash flow problems due to late payment (Case Study 7). The fact that SBRI is not a grant but more like a research contract and as such is not VAT-exempt, which has implications for tax planning around this, was highlighted as a negative issue by one company where more assistance would be useful (Case Study 7). On the other hand as noted above, the fact that SBRI is not a grant was seen a positive factor as it offers firms greater flexibility on how to spend the money.

It is at the Phase 2 that firms become far more acquainted with departments and with Innovate UK (which is often supporting the competition process). The “Dragon’s Den” style presentation and evaluation is crucial given the nature of the challenge; applying normal procurement evaluation criteria and methods do not bring out the quality and unique-ness of solutions proposed.

4.4 Post-Competition

4.4.1 The Experience of Public Sector Bodies

It is after Phase 2 funding ends that firms expect to achieve further commercial development, and ultimately the opportunity to see their innovation into the public sector or to wider market (in the case of a policy competition). However, the gap between the end of Phase 2 funding and commercial availability is not easily bridged. Further funding is nearly always required; the exceptions being where software is developed perhaps even at Phase 1 that can go all the way through to commercial availability. In two contexts: the SBRI Healthcare and the NC3RS competitions (the latter being a public private partnership arrangement) a further level of financial support is available. This is justified on the basis that in these areas, further product or service development is impossible without more government funding, the contexts of use being complex with high entry barriers to new products caused by the existence of regulatory barriers and a range of compliance requirements.

While in these cases (where a Phase 3 competition is held), departments clearly are putting up further resources with which to develop the technology and have a greater interest in the success of the challenge (directly as in the case of the SBRI Healthcare), in other cases, where departments are unsure about their needs or where the competition does not support an operational requirement, there is less support, and less monitoring of what firms achieve. Indeed, for many departments, monitoring the route to market is not an objective or not considered within their remit (of running the competition in the first place). There does not seem to be a consistent review or evaluation of competitions run. Lessons learnt tend to be ad-hoc and informal.

While departments are aware of the difficulties which Phase 2 winners (and also Phase 1 winners / Phase 2 losers) face in obtaining further support, departments were not able, we were told, effectively to signpost firms to other forms of support.

4.4.2 The Experience of Firms

At the post competition stage, firms require support in a variety of ways to further develop their technology. While we see that in the case of the operational competitions, there is support from the programme in the form of Phase 3 to achieve this, where there is no further support from the programme, other sources of support must be found. Amongst the firms we interviewed, a number were very confident about the availability of further support from other government schemes such as Smart that would help them. There was, however, little expectation that venture capital would be available to support firms, and concern that venture capital was not likely to be the right form of support for the small technology based firm at that relatively early stage of development.

Firms have found SBRI very useful from an endorsement perspective: it is useful to be able to indicate that they have successfully gone through the very robust SBRI process. Moreover, the process provides an opportunity for the company to test their product in front of an audience from several industries (Case Study 2).

Regarding the anticipated market, there was evidence in one case that the full market potential had not been appreciated – although a product aimed at large city authorities was developed successfully, the interest of large consultancy and logistics/transport firms was not considered: such firms could be brought in as interested stakeholders or even as sponsors along the lines of the NC3Rs use of large firms (Case Study 5). Another department noted that additional resources for commercialisation might have been useful for the participating firms (Case Study 9): a suggested source for such funding might be Smart.

One of the firms interviewed (it was a manufacturing firm) confirmed the difficulties that occur in trying to commercialize the prototype, since after Phase 2 the programme provides no further resources. Thus, while there may be a large market forecast, there is no resource available to fund expansion to production volumes (Case Study 3), to fully develop the product beyond a basic version (Case Study 8) or to develop the product in the light of clinical trials (Case Study 7). In the first example, the firm had also been unable to attract venture capital backing (Case Studies 8 and 9 also noted a lack of support for commercialisation or post-development). An unsuccessful Phase 2 applicant firm noted that post competition support and guidance in terms of advice on business strategy from Innovate UK was inadequate and the expectations for Phase 2 were not explicit and insufficient feedback was provided: further guidance on the business potential of the Phase 1 outcomes would have resulted in a different outcome. This is however difficult to do. The SBRI does not provide business coaching services and cannot support firm strategy development (of which the development of the product / service in the competition might be just one small part).

Innovation within the firm though is not just the result of a single product development. Innovative firms are ones that take a systematic view of the innovation process and are configured to innovate routinely. While the SBRI programme gives firms the opportunity to develop a new technology, to be successful, firms need to become systematic innovators.

It was still too early to assess for many of the competitions whether the solutions have actually been adopted in the market.

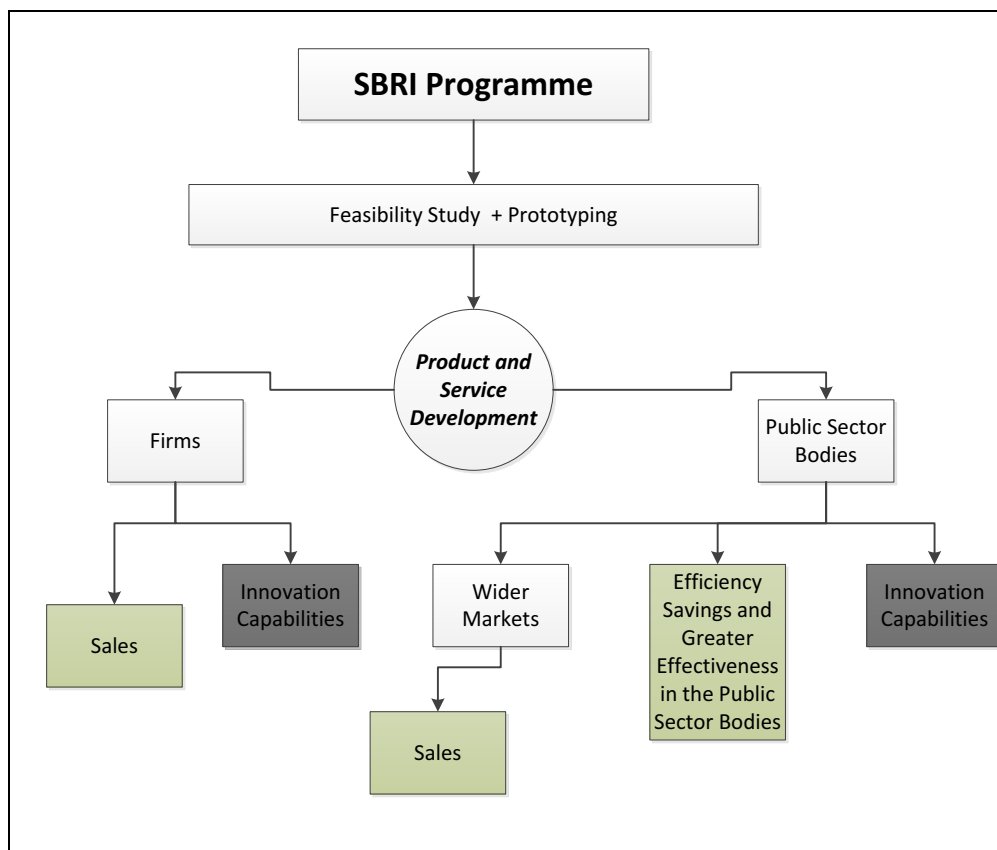
One case (Case 9) noted that feedback from the sponsor department was felt to have been inadequate. A successful Phase 2 firm also made the same criticism that the expectations from the Phase 2 selection panel were not as clear as they could have been (Case Study 8).

5.0 Findings: The Impacts of the Programme

5.1 Introduction – Types of Impact

The SBRI programme is intended to impact upon three main sets of organisations (see the figure below, Figure 16 which is an abstraction from the Logic Chart (Figure 5), and which focuses on the impacts expected): a) upon firms who are supported by the contract awards; b) upon departments whose operational needs may be met by the ultimate production of technologies (products or process) developed during an SBRI contract; c) and upon other actors which may ultimately purchase the output of the SBRI programme or utilize it in other ways (i.e. an innovation spillover). However, the SBRI programme does not simply deliver a prototype product or service which may ultimately achieve an economic benefit through the sales of firms or cost reduction and service improvement within public sector organisations. In common with other innovation programmes, the SBRI changes behaviour and can lead to increased capabilities amongst users and direct and indirect beneficiaries. As a programme in which government itself is intended to be a participant, SBRI can lead to changes in the way in which government departments are able to conduct their own activities. In the sections that follow, we consider both of these aspects, the direct benefits and the capability benefits that may lead firms to be more capable innovators in the long term, and departments more capable of using innovation in the future through achieving a better understanding where SBRI could contribute.

Figure 16 SBRI Programme Impact



(Source: study team)

5.2 Firms and Impact

5.2.1 Introduction

In this section we consider the impact of SBRI on recipient firms and the wider economy based on data from the evaluation survey. The impact assessment therefore relates to SBRI support provided as part of competitions which concluded over the September 2010 to September 2012 period.

Two important caveats are necessary in terms of the impact assessments included in this section. First, as in the previous section, the evaluation relates only to those competitions run by departments other than the MOD. Second, the robustness of the evaluation is limited considerably by difficulties encountered in conducting the evaluation survey. These issues are described in detail in Annex 6 but related primarily to the lack of any comprehensive database of scheme applicants and winners, the lack of any provision in the documentation relating to scheme application to allow follow-up for evaluation purposes and duplication of applications by some firms for multiple SBRI competitions. These issues reduced the effective sampling frame by around 50 per cent and meant that in the evaluation survey (and despite high response rates) information was available for only 48 SBRI winners. Of these, 30 received Phase 1 support only and 18 received both Phase 1 and Phase 2 support.

We divide the impact assessment into four sections:

- Section 5.2.2 reports information on a self-reported basis derived from a series of questions which ask SBRI contract holders about the impacts on their firms. This focuses on the impact of the scheme on sales of SBRI winners.
- Section 5.2.3 reports an econometric analysis of the impact of SBRI support focussing on a nearest neighbour matching approach designed to exploit the larger size of the unsuccessful applicant group and the non-applicant group in the evaluation survey. Two average treatment effects are reported: the difference between the group of SBRI winners and matched non-winners and the difference between SBRI non-winners and matched non-applicants.
- Section 5.2.4 reports derived BCR calculations taking into account the self-reported and econometric impact estimates alongside scheme costs. Allowance is also made for displacement and potential multiplier effects.
- Section 5.2.5 considers the strategic value added of SBRI over and above the short-term effects on firm performance. In particular, we consider self-reported impacts on the innovation capabilities of firms and/or the likelihood of them engaging in future innovation.

5.2.2 Subjective impact assessment – effects on sales

SBRI recipients were asked in the evaluation survey whether their receipt of SBRI had increased or decreased sales over the last two years: 41.7 per cent indicated that SBRI had increased sales, 45.8 per cent indicated that SBRI had had no impact on sales by that point. Only one firm out of those for which information was available (N=48) indicated that SBRI had actually had a negative sales impact. Thirty-four SBRI winners provided turnover data and information on the impact of SBRI. Overall, for these firms the average sales impact of SBRI was around 30.7 per cent over the last two years, 19.3 per cent for Phase 1 winners and 44.0 per cent for Phase 2 winners. As might be anticipated with any innovation support measure, however, these figures vary widely between firms with some of the largest percentage increases in sales due to SBRI occurring in firms with the smallest level of absolute sales⁴. This means that

⁴ These calculations omit two outliers which reported relatively small percentage sales increases due to SBRI but provided annual sales data in the evaluation survey which appeared inconsistent with their other reported data (e.g. employment). Both firms had accessed Phase 1 support.

while the average percentage increase in sales is relatively large the average absolute increase in sales is significantly more modest.

Where SBRI had an effect on turnover firms were also asked how long these effects would last. On (weighted) average firms estimated these effects would persist for 4.33 years, 5.23 years for Phase 1 recipients and 3.78 years for Phase 2 recipients. Firms were also asked whether these effects would increase, decrease or remain the same over this period. 49.8 per cent of firms reported that these effects would increase, 16.7 per cent that they would stay the same and 22.4 per cent that they would diminish. On balance this suggests that the current level of returns is likely to increase rather than decrease in future years.

These results provide a basis for estimating the average sales impact of SBRI for scheme winners, a calculation we do separately for Phase 1 and Phase 2 winners:

For Phase 1 winners' current sales, two years after the award of the SBRI grant (i.e. at the time of the evaluation survey), were higher by an average of £32,300, assuming half of this increase occurred in the year after the award and half in the subsequent year this suggests a total addition to sales in year 1 of £16,150 and in year 2 of £32,300. Assuming this sales increase persists for 5.23 years at the same level, as suggested in the evaluation survey, the total average cash addition to sales would be £16,150 + 5.23*£32,300 or £185,080.

Phase 2 winners' current sales, two years after the award of the SBRI award, are higher on average by £224,300. Assuming again that half of this increase occurred in the year after the award and half in the subsequent year this suggests a total addition to sales in year 1 of £112,150 and in year 2 of £224,300. Assuming this sales increase persists as suggested by firms for 3.78 years at the same level the total average cash addition to sales would be £112,150 + 3.78*£224,300 or £960,004.

Both of these estimates are likely to be conservative as the balance of firms indicated that their turnover benefits from SBRI were likely to increase rather than decrease in future years. The scale of any such increase was not quantified as part of the evaluation survey, however, making the scale of any under-estimation of future revenue gains difficult to assess. There is also the potential for some firms which reported no turnover increase as a result of their SBRI win at the time of the evaluation survey to benefit in the future. This too may mean that the measured impacts after two years may underestimate the longer term benefits of the scheme to winning companies.

5.2.3 Assessing impacts – econometric analysis

The relatively small size of the group of Phase 1 and Phase 2 winners limits the complexity of any econometric analysis which can be undertaken. To exploit the relatively large sizes of the applicant group (of non-winners) and the group of non-applicants we use a non-parametric, nearest neighbour matching approach to estimate average treatment effects for the population. Significant effects here suggest that being an SBRI winner (either Phase 1 or Phase 2) has created a difference between the performance of the recipients of SBRI support and closely matched firms which did not receive SBRI support. The scale of the estimated average treatment effects (or ATEs) suggests the size of the impact of the measure.

More specifically we consider three separate treatment analyses:

The total benefits of SBRI application and award – first, we consider the total effect of SBRI support including any benefits that firms derive from the application process itself and then from the receipt of either a Phase 1 or Phase 2 contract. We anticipate this effect will be the aggregate of the other two effects. It is derived by comparing the performance/behaviour of the group of winners with similar firms from the non-applicant group.

The benefits of SBRI support – second we consider whether, having applied for the scheme, winning either a Phase 1 or Phase 2 competition, has significant impacts on performance or behaviour. Evaluating this type of effect involves a comparison of the group of winners with unsuccessful applicants.

The benefits of applying for SBRI - finally, we consider whether the process of applying to SBRI itself has an impact on changing behaviour/performance. This might be the case, for example, where firms are stimulated to evaluate an idea by the possibility of getting finance, or through the more thorough structuring of a project. Evaluating this effect involves a comparison of the group of unsuccessful applicants and non-applicants.

This approach – estimating a total effect and then two component effects – parallels the standard approach in policy evaluation of estimating a ‘selection’ and ‘treatment’ effect. Here, the treatment effect – the pure effect of the SBRI contract – is captured by comparing the outcomes for SBRI winners and non-winners. The equivalent of the ‘selection’ effect is captured by comparing the outcomes for unsuccessful applicants and non-applicants. In part, differences in outcomes here may be capturing unobserved differences in the characteristics of applicants and non-applicants as well as the potential benefits of the application process.

In each case we base our matching on a series of business and market characteristics and examine the contrasting performance of firms over the 2013 to 2014 period since the completion of their SBRI competition. Matching estimators are based on a propensity score. For each firm in the treatment group the post-treatment outcome is actually observed. What cannot be observed is the outcome that would have occurred if the firm had not received the treatment. To estimate this, for each firm in the treatment group we employed “nearest neighbour matching”. This uses an average of the firms which are in the control group of untreated firms to predict the untreated outcome. The comparison of the (observed) treated outcome and the (unobserved) predicted untreated outcome then provides an indication of the effect of the treatment. Specifically, we focus here on the average treatment effect across the population of firms (i.e. those in both the treated and un-treated groups).

In our analysis firms are matched on a series of seven criteria:

- Government support – a binary variable indicating whether or not a firm had received support for technological development (other than SBRI) from either the UK government or the European Union.
- Exporting – a continuous variable representing the percentage of a firm’s sales which were exported
- External competition – a continuous variable representing the percentage of a firm’s competitors which are located in the UK.
- Graduates – a continuous variable representing the percentage of a firm’s workforce with a graduate level qualification.
- Establishment date – the establishment date of the firm.
- Size band – a set of dummy variables firm size bands.
- Sector – a set of dummy variables representing firm sector.

In each case we match single firms in the treatment group (winners or applicants) to four or more firms in the control group (applicants or non-applicants)(26). We also control for potential bias which arise when matching on two or more continuous covariates using firm sizeband and sector (27, 28). We implement the estimation using the ‘teffects nmatch’ module within STATA 13 (29).

We report treatment effects for three groups of variables: innovation activity indicators over the 2013 and 2014 period; turnover and employment growth over the same period; and, future innovation intentions in 2015 and beyond.

In terms of innovation activity over the 2013 to 2014 period we see significant average treatment effects (of SBRI winners relative to non-applicants across the whole range of measures (Table 32). Breaking down these effects into the winners v applicants and the applicants v non-applicants components, however, suggests that the most consistently significant effects arise in the latter category. That is the actual level of innovative activity among applicants is more often different to that of non-applicants – in this sense the potential effect of non-observable differences between the applicant and non-applicant group dominates any treatment effect related to the award of the SBRI contract. The average treatment effect for SBRI winners relative to applicants is, however, significant in the case of the probability of undertaking product or service innovation.

Table 32 Average treatment effects for innovation activity: 2013 and 2014

Treatment group	Winners	Winners	Applicants
Control group	Non-applicants	Applicants	Non-applicants
Outcome variables			
R&D spending (% sales)	19.6***	5.69	13.62***
Probability of innovation	0.462***	0.146**	0.180**
Probability of new to market innovation	0.339**	0.120	0.174**
Innovation cooperation	2.97***	0.623	1.476***

(Source: evaluation survey)

Comparing treatment effects for turnover and employment growth provides a less clear picture with none of the average treatment effects being statistically significant. It was reported in the interviews (case studies) that some firms reported an increase in the number of full-time, part-time or contract staff as a result of the SBRI competitions (e.g. case studies 1, 2, 4, 5, 8): in fact, one company noted that SBRI funding was the first contract they had won and was a critical factor in taking them beyond the start-up phase (Case Study 8). While these growth effects were not always entirely attributable to the SBRI project, it was often a major contributory factor. Such effects have also trickled down to suppliers (Case Study 8). Direct sales have also been reported of at least £600-700K (Case Study 4), with a target of £1.5m seen as evidence of commercial success.

Sales growth among SBRI contract winners was a predicted 14.8 per cent higher than that of the applicant group with employment growth 8.3 per cent higher. Here we also see little tendency for both the winners v applicants and applicants v non-applicants differences to be significant (Table 33).

Table 33 Average treatment effects for business growth: 2013 and 2014

Treatment group	Winners	Winners	Applicants
Control group	Non-applicants	Applicants	Non-applicants
Outcome variables			
Sales growth	0.108	0.148	-0.126
Employment growth	0.096	0.083	0.043

(Source: evaluation survey)

One useful variant on this analysis is to estimate the average treatment effect on the treated (rather than the whole population). This is helpful here as it relates more directly to the subjective estimates of the impact of SBRI contracts on sales growth considered in the last section. The results of estimating the

average treatment effects on the treated group are given in Table 34. The results for turnover mirror closely those of the average treatment effects for the population suggesting a total impact on sales growth from SBRI contracts of 12.4 per cent for all winners. As might be expected this is considerably below the average 30.7 per cent sales growth impact suggested by the subjective estimates reported earlier.

Table 34 Average treatment effects on the treated for business growth: 2013 and 2014

Treatment group	Winners	Winners	Applicants
Control group	Non-applicants	Applicants	Non-applicants
Outcome variables			
Sales growth	0.124	0.138	-0.032
Employment growth	0.073	0.030	-0.024

(Source: evaluation survey)

Considering future innovation we see a similar pattern to that for innovation for the 2013 and 2014 period. Again while the total average treatment effects are strongly positive the majority of this effect is attributable to the difference between applicants and non-applicants – the selection effect – rather than between winners and applicants (Table 35). The exception is marketing innovation where the award of the SBRI contract has a significant and positive effect.

Table 35 Average treatment effects for future innovation activity: 2013 and 2014

Treatment group	Winners	Winners	Applicants
Control group	Non-applicants	Applicants	Non-applicants
Outcome variables			
New product /service innovation	0.390***	0.063	0.292***
New strategic innovation	0.291**	0.117	0.207***
New marketing innovation	0.442***	0.213**	0.272***
Future cooperation for innovation	0.376***	0.039	0.290***

(Source: evaluation survey)

5.2.4 Cost-benefit calculations

In this section we outline calculations intended to provide a guide to the cost-benefit of SBRI support provided as part of competitions which concluded over the September 2010 to September 2012 period. We report two main calculations based on firms' self-assessment of the turnover impacts of SBRI and the econometric estimates. In both cases it is important to recall that the evaluation survey provided information on a relatively small number of SBRI winners (48) and that it excluded any competitions run by the MOD.

Our approach to estimating the economic impact of the SBRI programme is based on assessments of the turnover impact (self-assessment and econometric) which we translate into a GVA figure. Our approach follows the procedure set out in the Integrated Evaluation Framework (IEF 2) publications.

Turnover impacts are estimated using the number of SBRI winners over the two year reference period (competitions which concluded between September 2010 and 2012). Over this period, 193 Phase 1 contracts were awarded along with 156 Phase 2 contracts in non-MOD competitions. Based on the self-assessment returns by firms derived from the evaluation survey this profile of winners and the average turnover impacts discussed earlier suggest a total gross annual turnover impact of £41.2m by 2014 (£6.2m among the Phase 1 winners and £34.9m among the Phase 2 winners) and in subsequent years (Table 36). The estimated effects of the econometric estimation are based on the whole group of Phase 1 and Phase 2 winners and suggest a larger total impact of £54.4m by 2014 (Table 36). Note that the profile of

percentage and absolute impacts in the subjective assessment vary widely due to the largest percentage impacts of winning SBRI occurring in the smallest firms.

Table 36 Estimating average turnover effects of SBRI by 2014

	Phase 1	Phase 2	Total
Number of winners	193	156	349
Average turnover (2010)	£1.567m	£0.551m	£1.257m
A. Self-assessment			
Impact on turnover (%)	19.3	44.0	
Impact on turnover (£)	£32,300	£224,300	
Gross annual turnover impact	£6.234m	£34.990m	£41.224m
B. Econometric assessment			
Impact on turnover (%)			12.4
Implied impact on turnover (£)			£155,800
Gross annual turnover impact			£54.390m

(Source: evaluation survey)

As part of the evaluation survey we asked firms how long they anticipated the sales impacts of SBRI to last. Responses suggested 5.23 years for Phase 1 and 3.78 years for Phase 2.

Table 37 gives the cumulative gross turnover effects based on the estimates of the persistence of SBRI benefits derived from the evaluation survey. In each calculation we anticipate that the turnover impact grew equally over the two years of the impact period and then continues at the same level in future years. In the econometric assessment, which covers both Phase 1 and Phase 2 wins, to assess the persistence of benefits we take a weighted average of that estimated in the evaluation survey for Phase 1 and Phase 2 awards (4.58 years). These calculations suggest that with reported persistence the gross turnover effects of SBRI were £185.5m-£276.2m and with a three year benefits window gross turnover effects were £144.3m-£190.3m. Table 38 reports the same impacts applying a depreciation rate at 3.5 per cent pa to rebase benefits back to 2012 values.

Table 37 Estimated gross turnover effects of SBRI support

	Phase 1	Phase 2	Total
A. Self-assessment			
Turnover impact by year (per firm)			
2013	£16,150	£112,150	
2014	£32,300	£224,300	
2015	£32,300	£224,300	
2016	£32,300	£224,300	
2017	£32,300	£174,900	
2018	£32,300		
2019	£7,430		
Total impact (per firm)	£185,080	£959,950	
Number of winners	193	156	
Gross turnover impact	£35.720m	£148.752m	£185.470m
B. Econometric assessment			
Turnover impact by year (per firm)			
2013			£77,900
2014			£155,800
2015			£155,800
2016			£155,800
2017			£155,800
2018			£90,360
2019			
Total impact (per firm)			£791,460
Number of winners			349
Gross turnover impact			£276.220m

(Source: evaluation survey)

Table 38 Estimated discounted turnover effects of SBRI support

	Phase 1	Phase 2	Total
A. Self-assessment			
Total impact (per firm)	£161,600	£859,530	
Gross turnover impact	£31.190m	£134.090m	£165.280m
B. Econometric assessment			
Total impact (per firm)			£698,700
Gross turnover impact			£243.850m

(Source: evaluation survey)

Deriving gross total discounted GVA requires a turnover/GVA ratio. As noted earlier, however, the applicant group for SBRI is very different in sectoral composition from that of the UK population of firms, and is concentrated in relatively high productivity sectors. Standard approaches using average GVA to turnover ratios are therefore likely to provide a misleading estimate of the scheme's contribution to GVA. This calculation is spelt out in Table 39 which gives turnover and value added figures for each

sector for 2013 derived from the ONS Annual Business Survey. This suggests that on average GVA accounts for 28.2 per cent of turnover. SBRI applicants are however concentrated in sectors with above average GVA/turnover ratios, and constructing a weighted average GVA/turnover ratio suggests a GVA/turnover ratio for SBRI applicants of 48.57 per cent. Applying this ratio to the turnover figures in Table 54 gives an estimate of the discounted gross total GVA generated by the SBRI programme (Table 56).

Table 39 Estimating GVA to turnover ratio for SBRI applicants

Sector	Turnover £m	Value added £m	VA as % of turnover	SBRI Applicants %
C Manufacturing	522,106	156,975	30.1	8.8
F Construction	204,282	79,900	39.1	1.2
G Wholesale and retail trade; repair of motor vehicles and motorcycles	1,487,353	153,384	10.3	6.0
J Information and communication	198,895	99,656	50.1	29.6
L Real estate activities	54,250	36,789	67.8	1.6
M Professional, scientific and technical activities	228,944	129,404	56.5	26.3
N Administrative and support service activities	188,084	95,356	50.7	12.5
P Education	34,899	15,777	45.2	2.6
Q Human health and social work activities	47,629	30,152	63.3	8.7
H,I, R,S Other Service Activities	384,676	146,779	38.2	2.7
Total	3,351,118	944,172	28.2	100.0
Implied VA as % turnover among SBRI Applicants				48.57

(Source: Office of national statistics, Annual Business Survey 2013, Provisional Results)

Table 40 Estimated discounted gross value added of SBRI support

A. Self-assessment	
Gross turnover impact	£165.280m
Gross value added	£80.276m
B. Econometric assessment	
Gross turnover impact	£243.850m
Gross value added	£118.437m

(Source: evaluation survey)

Deadweight is implicit in each of the calculations reported up to and including Table 40 which reflect the turnover impacts actually reported by SBRI winners and those estimated relative to the control group of non-applicants. No further allowance is therefore made for this. Displacement may take place where publicly supported activity displaces other activity in the economy. This is most likely where firms are competing with other UK firms, where firms are selling into UK markets and where the products/services being developed as part of the publicly supported activity are not innovative or market creating. Balancing displacement, multipliers quantify the further economic activity (e.g. jobs, expenditure or income) stimulated by the direct benefits of an intervention. Standard values for displacement and multipliers have been derived from previous evaluations of R&D and innovation support measures and these are adopted here. Mean displacement is estimated at 24.5 per cent (30). Multipliers are thought to be relatively substantial from R&D schemes – on average implying a multiplier of 1.56 (31). The latter includes the supply chain effect (increased activity from beneficiaries’ suppliers to accommodate the extra output) and the induced effect (resulting from the consumption of incomes distributed in beneficiary businesses and suppliers). Applying the displacement and multiplier factors gives an estimate of net discounted GVA impact (Table 41) which can be compared to the cost of the scheme to derive cost-benefit ratios.

Table 41 Discounted GVA after displacement and multiplier effects

	A. Self- assessment	B. Econometric assessment
Gross value added	£80.276m	£118.437m
Displacement	24.50%	24.50%
Discounted GVA after displacement	£60.608m	£89.420m
Multiplier effect	1.56	1.56
Net discounted GVA impact	£94.549m	£139.495m

(Source: evaluation survey)

The additions to GVA arising from the SBRI programme are offset by the costs of supporting individual SBRI awards and the costs of scheme administration. These are estimated as follows on the basis of information provided by Innovate UK:

- Award costs over the two-year reference period were £56.170m including both Phase 1 and Phase 2 awards;
- Administration costs are estimated at £0.451m pa, or £0.902m for the two year reference period;
- Other Innovate UK staff costs are put at £3,600 per competition and £6,000 for a moderation panel. 37 competitions were run during the reference period (Table 17), suggesting a total moderation and staffing cost of £355,200 over the two years.
- Assessment fees are estimated at £400 per application. A total of 1409 applications for Phase 1 and Phase 2 awards during the reference period (Table 17), a total cost of £563,600.

This suggests a total scheme cost over the two year reference period of £57.99m. Comparing this to the net discounted GVA figures in Table 41 suggests cost benefit estimates of 1.63 (i.e. £94.55m/£57.99m) where effects are self-reported and 2.40 (i.e. £139.50m/£57.99m) on the basis of the econometric estimates. It is worth reflecting again, however, that in both cases these cost-benefit estimates are based on a relatively small number of competition winners (48).

5.2.5 Strategic value added (Firms' Capacity Benefits)

Strategic added value may arise through two main routes. First, firms which win SBRI contracts may accrue benefits over and above the short term gains in sales. Second, departments and their service users may benefit due to the introduction of new or improved services. In this section we consider these larger impacts as they arise for firms.

How did winning an SBRI contract benefit firms aside from its impact on sales? Table 42 highlights a range of strategic and organisational benefits which might have arisen from SBRI support over the two years since the award of the SBRI grant. The most common relate to the potential for SBRI to stimulate ideas for other innovation projects experienced by 83.5 per cent of recipients and the expansion of networks (81.9 per cent) and knowledge transfer (70.6 per cent). Each of these suggests the potential longer-term spillover benefits of SBRI and the potential for the direct benefits of any SBRI project – reflected in the BCR – to under-estimate the longer-term benefits of the scheme. Fewer firms reported that SBRI was important in terms of either accessing specialist equipment or facilities (33.3 per cent) or improving their manufacturing capabilities (5.0-17.8 per cent).

One other potential benefit of receiving public finance for innovation is the signalling benefit such finance provides (32). This suggests the possibility that receiving SBRI support may make it easier for firms to subsequently access other forms of external funding. Among the winners of Phase 1 and Phase 2 competitions around a sixth (16.6 per cent) reported that receiving SBRI support had had this positive benefit in the last two years, with another 38.8 per cent of firms indicating that SBRI had made it somewhat easier to access external finance over this period (Table 43).

Table 42 Organisational and strategic benefits of SBRI: Phase 1 and Phase 2 winners

	%
	Winners
	(N=48)
SBRI stimulated other ideas for new innovation projects	83.5
Expanded your innovation networks	81.9
Benefitted from knowledge transfer	70.6
Gained access to information about new developments or market opportunities	65.2
Increased access to specialist skills or talents	64.5
Increased your awareness of the public sector as a lead customer and its potential contribution to your business	59.4
Increased access to specialist equipment or facilities	33.3
Improved your manufacturing capabilities	17.8
Improved or modernized your manufacturing facilities	5.0

(Source: evaluation survey)

Table 43 SBRI influence on sourcing other external funding: Phase 1 and Phase 2 winners

	%
	Winners
	(N=48)
Made it much easier	16.6
Made it a little easier	38.8
Made no difference	42.7
Made it more difficult	0
Don't know/Not relevant	2.0

(Source: evaluation survey)

Behavioural or attitudinal benefits may also accrue from public support for innovation – so called behavioural additionality. SBRI winners were therefore asked about whether receipt of SBRI support had influenced attitudes within the business. Around a third of SBRI winners indicated that the scheme had made them more aware of their innovation potential over the last two years with larger proportions 47-53 per cent indicating that SBRI had made them more likely to engage in innovation in the future (Table 44).

Table 44 Organisational and strategic benefits of SBRI: Phase 1 and Phase 2 winners

	%
	Winners
	(N=48)
SBRI made us aware of our innovation potential	32.1
We are more likely to engage in innovation in the future because of our participation in the SBRI scheme	52.5
The business' attitude to innovation has become more positive	43.8
Senior management are more receptive and committed to innovation	47.4

(Source: evaluation survey)

Other more substantive benefits may result from SBRI funding relating either to developments in firms' product/service or IP portfolios and in terms of potential spin-out businesses. These are the focus of Table 45 and Table 46. Around two-thirds of SBRI recipients reported introducing either new or modified products/services as a result of their SBRI award with around a third creating new intellectual property in terms of patents, registered designs, trademarks or copyright (Table 45). Similarly, around a tenth of SBRI winners reported setting up new spin-out businesses while 19% developed some spin-out innovations or technologies, e.g. through licensing (see Table 46).

Table 45 SBRI effects on product/services and IP: Phase 1 and Phase 2 winners

	%
	Winners
	(N=48)
A new line of products / functionalities for your company	68.0
A modification of existing products/services for your company	60.0
One or more new patents or patent applications	33.7
One or more new registered designs or applications	30.0
Intellectual property protected by trademarks or copyright	37.8
A first contact with a government department	38.4

(Source: evaluation survey)

Table 46 SBRI effects on spin-outs business and technology: Phase 1 and Phase 2 winners

	%
	Winners
	(N=48)
Set-up a spin-out company	11.3
Sold a spin-out company	0.0
Developed any spin-out innovations or technologies	19.0

(Source: evaluation survey)

5.3 Public Sector and Impact

5.3.1 Introduction

The SBRI programme aims to achieve two main forms of impact for the public sector: the realization of departmental policy objectives and the meeting of operational needs. Within the programme, challenges are normally considered to be one type or the other. In the programme, the terminology used is “policy competition” where the goal is to develop a new solution to a policy objective, and “operational competition”, where the competition aims to meet the needs (the operational needs) of a public sector organisation. In the following sections the impacts of the programme for the public sector are considered. Firstly, the innovation or policy goal impacts are considered. Then the operational impacts are considered.

It should be noted that while the distinction is made by Innovate UK between policy and operational competitions, certain competitions may fall under both descriptions, and in any case all competitions whether policy or operational have the potential for the technologies to be sold beyond the lead customer. An example of such a competition is that of “Energy Efficient Whitehall” where nine Phase 2 contracts were awarded to firms that were to develop technologies for use in government buildings.

5.3.2 The Policy Goals of Government

The majority of the competitions run by the programme are policy competitions with the exception of the MOD competitions where most are operational. Of the 117 competitions for which we received information from Innovate UK, 65 were classed as policy competitions while there were 52 operational competitions. The evidence we obtained about the impacts of policy competitions comes mainly from interviews with departments and case studies.

As departments were not direct beneficiaries of policy competitions, we found they were not always aware of the benefits that arose from those competitions. While individual members of staff in departments who had been involved in policy competitions knew the firms that had been involved in the competitions, and were familiar with the competition processes, they were not usually aware of the detailed social and economic impacts which their competitions might have produced once the technologies were developed and commercialized. Some departmental staff were aware of this gap in their knowledge of the sales achieved by firms supported by the programme, and expressed concern that the lack of a body of evidence of impact might undermine the programme.

A comment often made in interviews about the innovation / policy competitions showed that departments and Innovate UK staff were more knowledgeable about the issues facing the firms if those firms had participated in the Phase 2 competitions. Generally, at Phase 1, there are a large number of firms involved in competitions and the period of the Phase 1 competition is too short for the staff involved in the competition (either from the programme or from departments) to be aware of the firms. By Phase 2, when the number of participating firms has dropped and the time over which the competition takes place is longer, project staff have more time to observe the firms. However, the knowledge of specific benefits that are likely to arise is very uneven and is not formally recorded.

Departments do however appear to lose touch with the Phase 2 losers. Firms that are successful at Phase 1 but whose application for Phase 2 funding is rejected are lost off the radar at that point. Some of these firms may well be able to continue on a development path, albeit a slower one, and our interview evidence suggests this is the case in a small number of instances, but the precise impact of the contract on a firm’s development of technology for wider markets is lost as there is no systematic process to record it.

We may safely conclude, so far as operational competitions are concerned, while outputs of the programme are recorded (they are defined as the Phase 1 reports Phase 2 prototype) the outcomes

(further development of the product of service – to Phase 3) are not formally recorded. Impacts that occur later still in the programme process (see Figure 5 Mapping Programme Logic) are again not the subject of any recording system. Given the absence of data at departmental and Innovate UK level, we rely on our interview and case study programme to make assessments of these.

Many of the cases report several outcomes, ranging from advanced prototypes (that have been bought by the sponsors or by further customers, through to second generation or more fully developed versions (Case Studies 1, 3, 4, 5, 11). A small number of inventions been patented (Case Study 3). It has also been reported that some of the components developed through the SBRI process have also found markets in their own right, even outside of the sector for which they were developed in the SBRI project (Case Studies 1, 4). In one case, however, production has been limited due to the inability to find suitable manufacturers in the UK (Case Study 3) although they have accessed Advanced Manufacturing Supply Chain funding to progress this.

Several of the outcomes have been completely unique and new to market (e.g. Case Study 1, elements of Case Study 4). In the former case, both the sponsor and the successful company believed that initial sales would generate a domino effect within the market, i.e. a spillover effect. Even Phase 1 outcomes have been used as a basis for further marketable products or have attracted customer interest (Case Study 4) or have been marketed in their own right (Case Study 5). IP has also been generated and protected (Case Study 11). One company that did not gain Phase 2 funding nevertheless found that, as a result of Phase 1 funding, it was still able to develop the product and get it to the manufacturing stage, albeit at a slower pace (Case Study 11).

The case studies all reported a range of actual and potential markets (i.e. where strong interest has been shown in the outcomes); these include other UK Government agencies and departments, UK universities and firms and foreign government agencies, universities and firms. It was also noted that some of the applications lie outside the initial sectoral market originally envisaged (Case Studies 5, 11).

5.3.3 Government Operational Needs

Two Government departments are the main users of operational competitions, the NHS/DH (which in the period of our analysis used 32 competitions) and the MOD which used 78 competitions. Both of these departments have developed their own capability in the use of the programme. Of the 130 operational competitions in the list of competitions provided to us, 110 were operated by either MOD or the DH/NHS programmes (85%). The NHS/DH capability is located with the SBRI Healthcare programme managed by Health Enterprise East but there is some help organisationally from Innovate UK and at the strategic level as the Head of the SBRI programme sits on the board of the SBRI Healthcare programme. The SBRI Healthcare programme responds to priorities identified by the Academic Health Science Networks which are NHS based organisations comprised of clinical specialists that seek to define and support state of the art healthcare in either product or process for use in the NHS. In the case of the MOD, the Centre for Defence Enterprise (CDE) runs the SBRI, although the CDE predates the SBRI programme.

We have not however been able to consider the effect on the MOD operational needs as MOD did not provide access either to data about the Phase 2 participants for our firm survey work or for our case study interviews. The study team did attempt to secure this information directly and through Innovate UK but through neither route was it possible to acquire information that would allow for an estimate to be made of what benefits had accrued to MOD.

In the case of the area of health where Department of Health and the NHS operational needs are supported by the SBRI Healthcare programme (operated currently by Health Enterprise East), we note the existence of 16 operational competitions.

In the context of the SBRI Healthcare programme, there is a prioritization process that seeks to make an estimate of the savings (in terms of either health outcomes and or operational costs of providing healthcare in the NHS) and proposals for competitions are assessed against these criteria and then funded or not. Evidence from the review of the SBRI Healthcare (33) suggests that SBRI impacts may result in significant cost savings for the NHS. The methodology chosen here is to examine 34 products developed from the programme and assess their individual likely cost savings. The report suggests that “the potential savings to the NHS range between £7.2m and £171m per year per technology”. Although the report advises considerable caution in drawing conclusions about additionality on the basis of these case study estimates, such savings as have been identified could represent a very significant financial benefit.

It is the view of the study team that any economic assessment of the programme (whether at departmental level or across the whole area of the programme’s operation) should take account of these benefits on departmental budgets, in addition to the benefits to firms (and elsewhere in the economy when the main impact is a policy impact). The extent of the savings indicated (but not demonstrated) in the case of the SBRI healthcare programme suggests that the capacity of the programme to save money may be significant. Valuation of the programme’s financial impacts should take account of this form of information.

However, while the NHS part of the UK SBRI programme has attempted some measures of these wider operational impacts, elsewhere there is a shortage of evidence of what has been achieved and what could be achieved. There are a number of reasons for this. Firstly the MOD has not provided any evidence to the study team that could be used to assess the operational cost savings. Secondly, other government departments and other public sector bodies interviewed have undertaken so few operational competitions that there are no documented examples of the costs saved. And where a department (the Home Office) has undertaken a number of operational competitions (e.g. Innovative Research Call, Have I got 'views' for you, Roadside Drug Detection, and Intent in Crowded Places) the department does not consider itself a direct user which would ever purchase the results of the SBRI Competitions and no formal monitoring of the financial impacts on the end-users have been undertaken. In the case of the Healthcare SBRI Review (34), a number of special separate studies were commissioned to investigate actual savings. The review reports estimates rather than actual savings, and in three of the cases it was not possible to make any assessment of cost-saving. Furthermore, in the case of the most beneficial project attributed to Company B in the analysis, while the estimate upper limit is £171m, the lower limit is £69m.

5.3.4 Capacity to Operate the SBRI Programme

In the earlier sections of 5.3 we have considered the contribution which the programme makes to the policy goals and to the operational goals of government. In this sub-section we consider the development of public sector bodies’ innovation capability through the use of the SBRI programme. SBRI is intended to contribute to the development of public sector bodies’ innovation capability in a number of ways: it is meant to make government departments more aware of the opportunities that may exist for innovation amongst the UK SME supplier base; it is intended to provide departments with a greater understanding of how its own departmental responsibilities and needs can be discharged through more innovation procurement activities. These changes that are expected are what we term capacity and capability developments: they are a change in organisational capability and readiness to work in new and improved ways. We draw together a range of evidence for this from interviews of departmental contacts and through our case studies of particular SBRI competitions.

We note that most departments have begun to think strategically about procurement but not all have the administrative capability to “routinize” SBRI in the policy making process. The reason why only a few departments consider SBRI regularly is that the SBRI programme is not used frequently.

All departments we interviewed cited regular interactions with awardees throughout the SBRI process, and this is clearly very different to relationships/ interactions with firms in other procurement routes, which tend to be more arms’ length. All departments interviewed in state that they have all seen a significant increase and proportion of SMEs applying and participating via the SBRI route. However, the information provided by Innovate UK on firm size is very limited and cannot be used to corroborate this. Many departments have also been able to access firms that they would not normally come across or have interaction with, e.g. from other sectors.

However, departments are aware of significant differences in the quality of applications from SMEs compared with larger firms who are more familiar with making tenders. While the ideas that come from smaller organisations are very innovative, departments have become more aware of the limitations under which SMEs and start-ups operate, and they are not as skilful in crafting their application to “sell” themselves and their ideas. An important step which some departments have taken is to begin to provide as much documentation and information as possible before competitions begin to help these applicants, and Innovate UK also realize the need for this kind of help. Furthermore, a few departments also run pre-competition workshops and events, which help to give notice to industry of upcoming calls and thus allow them to prepare themselves and prepare better applications.

A small number of departments believe that SMEs might be further stimulated if responsive mode funding was provided as the SBRI route was found generally to be so attractive to firms. However, how this could be matched to the notion of departmental challenges is difficult to assess and it was noted that it could lead to the capture of resources by powerful interest groups (Case Studies 3 and 11).

It was believed that awareness and understanding of how to operate the SBRI remains insufficient within departments. If the scheme is to be expanded, training will need to be provided to departmental staff (Case Study 11). It was noted in a number instances, however, that once firms had participated in the SBRI programme, they quickly learned what was required and used this awareness to apply for subsequent SBRI competitions. As we do not have reliable data on repeat applications, we cannot determine if there is a “training effect”, but we do expect that it will exist at a low level in the programme (in that repeat applications are likely to be relatively few in number, the programme having only run for a short period and having only supported 2000 firms including both Phase 1 and Phase 2).

Part Three - Conclusions and Recommendations

6.0 Conclusions and Recommendations

6.1 Baselines, Targets and Data Collection and Management

6.1.1 Conclusions

General Usage of the programme

Since 2008-09 when it was revised and re-introduced, the SBRI programme has been increasingly used by most departments during 2008-2014, in terms of various indicators including: the number of competitions launched, the number of applications received, the number of contracts awarded and the value of contracts awarded.

The number of competitions has risen steadily over the period from 2008-2014. Over £200m has been spent through the SBRI programme mechanism since 2008, a sum of money that excludes programme management costs. An increasing number of public sector bodies are using the programme. There are now 70 public sector bodies that have taken part in the programme in challenge development. Use of the programme is concentrated within a small number of departments: MOD, Department of Health and the NHS, and DECC are the main user departments in terms both of the number of challenges promoted and the value. Innovate UK is also an important contributor to the scheme financially, funding competitions where it is responsible for the challenges (£58m over the period 2008 to 2014 July), but also co-funding challenges that are led or which involve combinations of departments (£26m over the whole period 2008 to 2014 July). These four main bodies (Defence, Health, DECC and Innovate UK) account for at least 80% of all programme money spent, this percentage being possibly higher as the recently launched two-phase competitions enter the stage of awarding Phase 2 contracts.

MOD has been consistently benefitting from Innovate UK co-funding throughout the three periods, while co-funding for other departments has not been regular. In particular, DECC and DH, despite their large investment in SBRI, received a very low contribution from Innovate UK.

We note that over the whole period, half of the firms which applied had fewer than 10 employees. But the programme also had applications from large firms. Our estimate based on the sample of data provided to us is that 19% of firms that applied were larger than 250 employees.

While many user departments have previously featured active use of single-phase competitions, two-phase competitions have appeared as the more and more frequently used approach across departments, taking up 40% of all competitions in Period 1 (October 2008 – August 2010), 47% in Period 2 (September 2010 – September 2012) and as high as 73% in Period 3 (October 2012 – July 2014).

Applications, contracts and values

Number of applications varies across departments. In total all the major user departments had attracted 8422 applications (7188 Phase 1 applications and 1234 Phase 2 applications) from all types of firms/organizations. Innovate UK, MOD, NHS, DECC and DH have been the most active user departments in launching competitions and receiving applications. Although the number of awarded Phase 2 contracts has been much smaller than that of Phase 1 contracts, the average value of Phase 2 contracts has been much higher (around 6 times of Phase 1 contract value). In terms of spending on each single competition, it seems that competitions launched by departments such as DECC, NHS, and Innovate UK are of higher values than that of other departments such as DEFRA.

Table 47 Size of Applicant Firms to SBRI %

Size-band	Applicants 2011-12	Applicants 2013-14	Total
Fewer than 10 employees	45.8	54.3	50.1
10-50 employees	19.8	17.1	18.5
50-250 employees	8.4	5.3	6.8
250 plus employees	26.0	23.3	24.7

(Source: Evaluation Survey)

Success Rates

For Phase 1 only competitions, the success rate has been higher than that of Phase 2 only competitions. While for two-Phase competitions, the success rate of Phase 2 has been higher than that of Phase 1.

With respect to the demographic features of firms, we found that the success rates of differently sized firms have been rather in proportion to their sizes. For instance, bigger firms tended to have higher chance of winning a contract. The rates of success for large firms, medium firms, small firms and micro firms have been 39%, 38%, 23% and 15% respectively. This observation has been made based on the limited sample we have obtained from the programme.

The success rates of firms based in different regions varied as well. We observed that firms located in the South of the UK have been the most active applicants to the SBRI programme, while firms located in Scotland have been most likely to get a contract. Domestic firms located in the Midlands have been least successful in gaining contracts. Again, our only data on the location of firms is from the departmental data and is a very small subset (approx. £17m out of £226m) – so not perhaps very reliable.

Modes – policy versus operational

Among all the 195 competitions, 130 were operational competitions, and 65 were policy competitions. For departments such as healthcare (DH and NHS) and MOD, competitions are exclusively ‘operational’, i.e. for their own use. While for departments such as DECC, Defra, and those belonging to the BIS family (including BIS, NC3Rs and Innovate UK), competitions are exclusively in the ‘policy’ mode. For other departments, there have been both policy and operational competitions.

Among the policy competitions, 22 out of the 65 were single-phase competitions; while among the operational competitions, 60 out of the 130 were single-phase competitions. A small number of departments use the programme for both policy and operational challenges. It would appear that departments are being flexible in their use of the programme, this is encouraging.

In terms of success rates, we found that policy competitions tended to have higher success rates (29%); success rates of operational competitions were lower (18%).

Overall trends

The cumulative numbers of competitions launched over the years have been growing steadily, with slight peaks of newly launched competitions in April 2009, October 2009, September 2011, September 2013 and May 2014. The majority of the competitions have awarded Phase-1 contracts, either in the form of single-phase competitions or in the form of two-phase competitions. The trends for applications and contracts awarded followed similar patterns. The values of contracts grew rapidly in recent years, mostly owing to the awarding of new Phase-2 contracts.

The total number of competitions launched during this period was 195, and the total number of competitions qualified for financial analysis (i.e. having contracts awarded) was 186.

Target Setting

The SBRI target is regarded as having had two main effects: it has given what departments believe is a well-justified emphasis to a scheme which has potential to contribute in a number of ways the UK through its use by a range of public sector bodies; and it has caused a degree of frustration as the targets have been perceived by some in departments as simplistic and inflexible.

Data Collection and Management

The programme management has a limited view of key aspects of the programme, arising from the fact that there is no single record of SBRI applicants nor is there a single record of winners. Departments have non-standardized approaches to data collection and management. Communication between departments appears to be limited to the provision of information about applicants or winners to Innovate UK, and the provision of information for monitoring purposes is not occurring.

6.1.2 Recommendations

Any assessment of the success of the SBRI depends to a significant extent upon how much is known about the operation of the programme. Existing systems of information management in the programme do not provide a sufficient level of understanding of how impact is created within firms or how departments benefit from the programme. We recommend that information management and performance management of the programme should be supported by an information management scheme so that the Department for Business Innovation and Skills (BIS) knows in real time which firms have taken part in the programme, and what departmental benefits the programme creates. The participation of firms in the programme should be tracked centrally, for example using company registration number, allowing cross-referencing to other data sources for impact assessment purposes and policy development within Innovate UK and within individual user departments.

Evidence concerning the effect of the target is conflicting. The use of targets appears to have been associated with greater use of the programme, although it is difficult to say with confidence that increasing use had resulted directly and exclusively from the target. Increasing use of the programme predates the announcement of the target, yet departments that implement the target have increased their use of the programme more than those which do not have a target. The current rate of use is still well below target in the current year 14-15. We recommend that a target is kept in place but that the target should be made more flexible to take account of the capacity and level of usage within departments, budget cycles, rate of uptake, which can fluctuate (particularly in the case of small departments and bodies). Departments should be encouraged to participate actively in the new target setting process.

6.2 Process

6.2.1 Conclusions

Use of the Programme by Public Sector Bodies

Firms believe that the SBRI is sound in concept and effective in practice. Departments believe that the process is helpful to them and is effectively managed. The role of Innovate UK in developing challenges and supporting departments has been largely positive; there are high levels of satisfaction amongst departments with its role. Firms that participate at Phase 2 also appreciate the work which Innovate UK carries out in supporting competitions.

SBRI is not properly embedded in departmental decision making. It needs to be considered alongside all the other mechanisms that government can use in the operational and the policy contexts.

Signposting to other forms of support that are available could be improved. Firms vary in their abilities to secure further funding either at exit from the programme at Phase 1 or at Phase 2. Evidence from interview suggests that a substantial number of firms may not know how to access further funding.

The SBRI Healthcare is providing Phase 3 support. This appears to be a valid and effective way of extending the operation of the programme to cope with specific and complex innovation contexts. This extra layer of support does not exist in the rest of the programme and may not be justifiable there.

Regular challenge announcements on a six monthly cycle make firms more aware of the SBRI. Infrequent, ad hoc challenge publication can make the programme less visible. Regular challenge setting takes place in the health context but not elsewhere.

Communication between Innovate UK and departments and between Innovate UK and firms is mostly good. Some firms that are not successful at Phase 2 report lack of feedback on their applications, but this appears to be a limited phenomenon when all the evidence we have is considered.

Use of the programme by Firms

Firms appreciate the competitive aspect of the programme and the broad scope of the challenges which encourage thinking outside the box and innovation. Occasionally, Innovate UK appears not to have had all the resources that are needed to ensure that communication with firms works well, but it is generally meeting their needs for information, feedback and support.

It was reported that the SBRI process had been ‘catalytic’ in that it offered an opportunity to develop and trial a potential product that would normally have remained on the drawing board. SBRI often acted as a stimulus for firms to operationalise ideas. Thus, the scheme had a significant stimulus effect in getting nascent ideas further towards commercialisation and had acted as an important funnelling process. Major contributory factors to this were the indication that a market for such products existed (which is implicit as part of the challenge-led approach) and the opportunity to shape their development through close discussions with a range of interested stakeholders. The early-stage networking/workshop events were also generally seen as a positive feature.

The ability to retain IPR was regarded very positively by firms. Firms are however sensitive about IPR arrangements and any appearance of a threat to their rights to own the results of SBRI competitions are taken seriously.

Participation in the scheme led to examples where companies were able to explore and develop potential markets (at reduced risk), increase their internal skills capacities, expand the number of employees (full-time or contract staff) and develop links with companies in the same or related sectors (both suppliers and competitors). Many companies welcomed the additional opportunities provided by sponsoring departments to showcase their products through a range of activities or to gain access to the departments’ networks of stakeholders. Evidence of positive impacts on direct sales was also reported.

Overall, SBRI was seen to offer a unique, flexible mechanism by which these types of project could be supported allowing a high level of autonomy on how the firms ran the projects (a consequence of it being contract- rather than grant-based). The simple application process was generally well-regarded and very few payment issues were encountered.

Participation in SBRI was seen as a useful attribute when applying for additional government or other sources of support. However, there was evidence that several firms were ‘serial’ (often successful) SBRI applicants.

Access to venture capital funding at programme exit is limited. We believe a number of firms would not wish to take this route for expansion because of the risk of loss of control. But some firms would wish to obtain further funding, particularly to acquire manufacturing capacity, and even facilities, where the outsourcing route was not to be followed.

6.2.2 Recommendations

As yet, the SBRI is not yet recognized at senior levels in departments as a policy option that can and should be used as a matter of routine to achieve departmental objectives. The relatively low level of use of the programme is one reason why SBRI is not more widely recognized, but the other reason is that responsibility for using SBRI is not situated within the higher levels of departmental structures. We recommend that Innovate UK and its parent department BIS work with user departments to raise interest in SBRI at the highest levels in departments.

Innovate UK has generally discouraged the programme from being operated and perceived as a collaborative research programme, preferring to use and promote the competitive aspect and this is appreciated by firms. In certain cases though we recommend inter-firm networking and collaboration at the pre- or early project stage kick-off and workshop events in order to develop contacts between successful Phase 1 participants and the potential cross fertilisation of complementary ideas. Further support to firms at the pre-challenge phase on partnering and on how best to craft applications to the programme might be provided in order to assess the value in the long term of this kind of pre-competition briefing and preparation. Such activity is used in US government department implementations of their SBIR.

The ability to retain IPR was regarded very positively by firms, provided simple arrangements are in place to ensure this. However, in some competitions within the NC3Rs context, the larger organisations participating as partners alongside government have brought with them more complex legal frameworks, particularly regarding IPR, than firms participating in the competitions might have expected from the SBRI. Innovate UK should ensure that the involvement of third parties in this way does not discourage small firms from applying to the programme.

We recommend greater budgetary flexibility within departments in order to overcome the issues associated with annualised budget cycles. There are signs that in the area of Health, this problem can be overcome.

We recommend that post-project, firms are signposted to additional sources of support, for example, to support additional development activities, product trialling or market development.

If the scheme is to be expanded to other departments/agencies, either by extension of the targets or by showcasing of the benefits offered by SBRI, training will need to be provided to departmental staff since awareness of how to operate the scheme is variable.

6.3 Impact

6.3.1 Conclusions

Our survey evidence on the progress of firms through the SBRI competitions during 2011 and 2012 suggests three main conclusions. First, firms generally find the Phase 1 and Phase 2 application processes helpful and constructive. Second, where support is provided either through Phase 1 or Phase 2 funding, the vast majority of firms report achieving all or most of their objectives. Finally, relatively few SBRI funded projects (4.6 per cent in Phase 1) would have proceeded unchanged without SBRI support; a further 39 per cent proceeded but either reduced in scale or delayed. In operational terms the scheme therefore works well for participating firms with overwhelmingly positive company feedback and high levels of additionality in Phase 1 support. Conclusions in relation to Phase 2 support are tentative due to small respondent numbers but here too additionality seems high. For competitions run in 2013 and 2014 it is too early to judge impact as yet but the experience of firms applying to competitions over this period largely mirrors the positive experience of firms over the earlier 2011 to 2012 period.

Firms benefitting from SBRI are – perhaps unsurprisingly – rather different from the general population of UK firms, with the characteristics of firms applying during the 2011-12 period and 2013-14 period broadly similar. In particular, SBRI applicants are generally larger and younger than the general population of firms and appear concentrated in the Information and Communication (29.6 per cent), professional, scientific and technical activities (26.3 per cent) and administrative and support service activities (12.5 per cent). Each of these sectors is significantly over represented in comparison to the UK population of firms. The proportion of applicants in manufacturing (8.8 per cent) and healthcare (8.7 per cent) were broadly in line with the population proportions. SBRI applicants have a much better qualified workforce than non-applicants – nearly twice as many SBRI applicants have a 50 per cent graduate workforce as non-applicants.

Our assessment of the impact of SBRI through competitions during 2011 and 2012 is hampered somewhat by the difficulties encountered in developing a sampling frame for the evaluation survey and the lack of data on MOD applicants and winners to their SBRI competitions. Both reduced the scale of the evaluation survey and limited the depth of analysis which could be undertaken and the robustness of the final evaluation results. With these caveats our analysis suggests that in 2014, two years after the award of the SBRI contract Phase 1 winners' sales are higher on average by £32,300, Phase 2 winners by £224,300. Our econometric analysis – matching winners with similar firms in the non-applicant population – suggests a turnover effect of around 12.7 per cent on average across the Phase 1 and Phase 2 competitions.

The resulting benefit-cost ratios are 1.63 where they are based on firms' subjective estimates of impact and from 2.40 where econometric estimates of impact are used. Four important points need to be borne in mind when considering these estimates. First, due to a range of issues encountered during the process of the evaluation they are based on a relatively small number of SBRI winners. This inevitably reduces the robustness of the estimates. Second, SBRI is intended to benefit both the firms participating in the scheme and the sponsoring department. Our benefit-cost calculations do not take into account any benefits in terms of departmental cost savings or service improvements. Third, our estimates do not take into account a range of un-quantified strategic and operational benefits derived by firms. For example, there is the potential for SBRI to stimulate ideas for other innovation projects. This positive spillover was experienced by 83.5 per cent of recipients. Around a sixth (16.6 per cent) of SBRI winners also reported that receiving SBRI support had made it easier to access additional finance in the last two years, with another 38.8 per cent of firms indicating that SBRI had made it 'somewhat easier' to access external finance. Finally, it is worth noting that our evaluation survey was conducted around 2 years after firms' SBRI competition wins. Positive effects may occur in future which we are not capturing in the current

survey. Each of these limitations is likely to mean that our benefit-cost estimates are likely to underestimate the value of the scheme, an effect which is likely to be greater for SBRI than for other programmes given the emphasis on departmental service innovation.

The study team believe that any economic assessment of the programme (whether at departmental level or across the whole area of the programme's operation) should take account, in addition to the benefits to firms (and elsewhere in the economy when the main impact is a policy impact), the benefits of SBRI programme on departmental budgets which will mainly be in terms of efficiency savings and improved effectiveness. The extent of the savings indicated (but not demonstrated) in the review by the Office of Health Economics of the SBRI Healthcare programme suggests that the capacity of the programme to save money may be significant. But more work is needed in this area to assess the likely extent of savings. This will involve comparison of SBRI with alternatives in order to achieve a proper measure of the additionality of the programme.

6.3.2 Recommendations

SBRI generally works well for the firms which both apply unsuccessfully and win SBRI competitions. In operational terms the scheme therefore seems to be effective. Levels of additionality are also high and there therefore seems little need to change the current approach to delivering the scheme. Competition winners are also achieving most or all of their project objectives from their SBRI projects. Government too is benefiting from the programme but the overview of what the programme is achieving for Government is incomplete.

This raises questions about whether SBRI winners are currently deriving the maximum commercial benefit from their SBRI supported projects, and whether departments are realizing the wider benefits that flow on from their support of policy or operational challenges.

We recommend that: departments should seek to enhance their understanding of whether and how SBRI winners maximise the commercial value from their SBRI projects. This can be accomplished by a range of activities but it will be underpinned by a system of project monitoring of challenge outputs, outcomes and impacts that does not yet exist in any real formal sense.

Annexes

Annex 1 Public Sector Users of the SBRI by July 2014 (WP1)

Table 48 List of Public Sector Bodies involved in SBRI by July 2014

Count	Organisation	Count	Organisation
1	ABMHB	36	InvestNI
2	BCUHB	37	IPO
3	BIS	38	Kent Surrey and Sussex AHSN
4	Border force	39	Met Police
5	Cardiff City Council	40	MI5
6	CPDNI	41	MI6
7	CPNI	42	MOD
8	DARD	43	Natural Resources Wales
9	DCLG-HCA	44	NC3Rs
10	DE&S	45	NERC
11	DECC	46	NHS London
12	DECC Bioenergy	47	NHS Middle East
13	DEFRA sustainable consumption	48	NHSSPS
14	DEFRA Waste management	49	NIC
15	Design Council	50	NIEA
16	DETI	51	NTTB
17	DfT	52	NOC
18	DH-NIHR	53	North East and North Cumbria AHSN
19	DOENI	54	North West Coast AHSN
20	DRDNI	55	Northern Ireland Screen
21	DWP	56	Ordnance Survey
22	EA	57	Oxford AHSN
23	East Midlands AHSN	58	SC SHA
24	Eastern AHSN	59	SEC SHA
25	EEDA	60	South London AHSN
26	EESHA	61	South West Peninsula AHSN
27	EIT	62	Innovate UK
28	FSA	63	UCL Partners AHSN
29	GCHQ	64	UKSA
30	Greater Manchester AHSN	65	Wales
31	Highways Agency	66	Wessex AHSN
32	Home Off - INSTINCT	67	West Midlands AHSN
33	HOSDB	68	West of England ANSH
34	Imperial College Health Partners AHSN	69	WRAP
35	INSTINCT	70	Yorkshire and Humber AHSN

(Source: Innovate UK Dashboard data v236)

Annex 2 Competitions excluded from financial analysis

Table 49 Calculation methods for Innovate UK Management Data

No.	Indicator	Calculation method	Remarks
1	Average award (P1)/Average contract value by competition (P1)	Value of contracts (P1)/number of contracts (P1)	For 'P1 only' and 'P1+P2' competitions
2	Average award (P2)/Average contract value by competition (P2)	Value of contracts (P2)/number of contracts (P2)	For 'P2 only' and 'P1+P2' competitions
3	Average value per competition for each department	Total contract value/number of competitions	Treat 'P1 only', 'P2 only' and 'P1+P2' competitions separately
4	Number of applications (P1)	Number of P1 applications	For 'P1 only' and 'P1+P2' competitions
5	Number of applications (P2)	Number of P2 applications	For 'P2 only' and 'P1+P2' competitions
6	Number of competitions	Count competitions launched	
7	Number of contracts awarded (P1)	Number of P1 contracts	For 'P1 only' and 'P1+P2' competitions
8	Number of contracts awarded (P2)	Number of P2 contracts	For competitions which awarded P2 contracts
9	Total number of applications (P1+P2)	Number of P1 applications + Number of P1 contracts awarded	For P1+P2 competitions only
10	Total number of contracts awarded (P1+P2)	Number of contracts awarded (P1) + Number of contracts awarded (P2)	For P1+P2 competitions only
11	Total Innovate UK co-fund (%)	Innovate UK contribution (P1+P2)/value of contracts (P1+P2)	For competitions of non-Innovate UK departments only
12	Total Innovate UK contribution (P1+P2)	Innovate UK contribution (P1) + Innovate UK contribution (P2)	For P1+P2 competitions of non-Innovate UK departments only
13	Total value of contracts (P1+P2)	Value of contracts (P1) + Value of contracts (P2)	For P1+P2 competitions only
14	Innovate UK co-fund P1 (%)	Innovate UK contribution (P1)/value of contracts (P1)	For 'P1 only' and 'P1+P2' competitions of non-Innovate UK departments
15	Innovate UK co-fund P2 (%)	Innovate UK contribution (P2)/value of contracts (P2)	For 'P2 only' and 'P1+P2' competitions of non-Innovate UK departments
16	Innovate UK contribution (P1)	Innovate UK contribution (P1)	For 'P1 only' and 'P1+P2' competitions of non-Innovate UK departments
17	Innovate UK contribution (P2)	Innovate UK contribution (P2)	For 'P2 only' and 'P1+P2' competitions of non-Innovate UK departments
18	Value of contracts (P1)	Value of contracts (P1)	For 'P1 only' and 'P1+P2' competitions
19	Value of contracts (P2)	Value of contracts (P2)	For 'P2 only' and 'P1+P2' competitions

(Source: study team)

Note: We consider 1 contract corresponds to 1 application.

Annex 3 List of Organisations Responding to the Study

Table 50 Organisations Responding in WP2

Organisation	Number of Interviews
Association for Innovation Research and Technology Organisations	2
Department for Business Innovation and Skills	2
British Maritime Technology Group Ltd	1
BRE Ltd	1
Innovate UK	2
Intellectual Property Office	3
NC3Rs	1
NHS	2
PERA Technology	1
QinetiQ	1

Table 51 Organisations Responding in WP4

Department	Type (target/ non-target)
Department of Health (DH)	Target
National Health Service (NHS)	Target
Department for Environment, Food and Rural Affairs (Defra)	Target
Department for Transport (DfT)	Target
Department of Energy and Climate Change (DECC)	Target
Home Office (HO)	Target
Department for Business, Innovation and Skills (BIS)	Non-target
Innovate UK (Innovate UK)	Non-target
Welsh Government	Non-target
Northern Ireland	Non-target
NC3Rs	Non-target
Environment Agency (EA)	Under DEFRA target

Table 52 Organisations Responding in WP5 Departments

Departments/Agencies:
Innovate UK
Health Education England, NHS
Jisc TechDis (Department for Business, Innovation and Skills)
Department for Environment, Food and Rural Affairs
National Oceanography Centre (Natural Environment Research Council)
Department of Enterprise, Trade and Investment Northern Ireland
National Centre for the Replacement, Refinement and Reduction of Animals in Research

Table 53 Organisations Responding in WP5 Firms / Participants

<u>Firms/participants:</u>
Actual Analytics
AstraZeneca plc
Autonomous Surface Vehicles Ltd
Cardiff Metropolitan University, School of Design
Cardiocity Ltd
Clyne Energy Ltd
GamelabUK
Igeolise
Intrepid Minds Ltd
Message Dynamics
New Generation Biogas Ltd
Inquiring Minds
OLI (Outside Looking In)
uMotif Ltd
Zeta Group

Annex 4 Conducting the Company Surveys

A4.1 Introduction

In this annex we provide details on the aims, sampling frame and conduct of the two company surveys completed as part of the SBRI evaluation. In each case the design of the surveys builds on the logic model for SBRI provided earlier which illustrates the intent of the programme to impact on recipient firms, government departments and the wider economy. Both surveys also reflect the customer journey through the scheme which envisages that as part of a Phase 1 competition firms may benefit from the process of formalising their innovation proposition and identifying new partners. Phase 1 support offers firms an opportunity to evaluate their technology and begin a potential move towards commercialisation. The Phase 2 application and support process then continues this development. At the same time the department and wider society may benefit from the developments being made, especially where these are commercialised and widely adopted.

The scale of any benefits originating from SBRI – as with other public initiatives – may be larger than the impact on those firms benefitting from the scheme due to multiplier effects. Displacement effects – through which assisted firms displace economic activity in other UK businesses – or leakage effects – where technologies or benefits flow abroad – may reduce the scale of any benefits. Both are also reflected in the surveys.

We report here on the conduct of two surveys each relating to a specific period and each with a rather different intent:

- The first **evaluation survey** is intended to provide the basis for an estimate of the cost and benefit of the SBRI scheme. More specifically, our aim was to assess the impact of those SBRI competitions which were completed during the September 2010 to September 2012 period. We measure the impact on recipient firms over the subsequent two years (i.e. October 2012 to September 2014). Three groups of firms are surveyed in the evaluation survey: SBRI applicants, SBRI competition winners and a control group of non-applicants matched by size band and sector.
- The second **Baseline Survey** also covers SBRI applicants, winners and a control group to provide the basis for future follow-up. Here the specific objective was to gather information on those firms which were applicants and winners in competitions which were completed over the September 2012 to April 2014 period.

Conducting both surveys proved particularly challenging due to the dispersed nature of the SBRI scheme, the lack of any integrated application or data management system and the lack of information available on SBRI competitions run by the MOD. In the surveys it is also important to acknowledge that we cover SBRI winners and two control groups. These are described in more detail below but alongside winners we also survey a group of unsuccessful applicants and a matched group of non-applicant firms.

A4.2 The Evaluation Survey

A4.2.1 Survey aims and objectives

Estimating the impact of any innovation support measure ex post is difficult due to the inherent time lags and because the innovation process is not linear⁽³⁵⁾. These difficulties arise even if support was distributed randomly across the applicant group. Instead, in SBRI – as in the majority of other innovation

support measures – support is provided to firms on the basis of an expert evaluation of the project proposal, creating the potential for selection bias: it could be the better firms which are attracting support, firms which would have performed better anyway even if they did not receive support. In the research literature this is known as ‘un-confounded allocation’ – a situation where the allocation of support is related to recipient characteristics but un-related to outcomes⁵.

Estimating the effect of SBRI without accounting for this (potential) selection bias may provide biased estimates of the true impact of the scheme. Doing this requires information on both SBRI winners and comparable groups and relatively detailed information on the characteristics of firms to enable us to model separately the probability that a firm would receive SBRI support and its impacts (36). We therefore survey three groups of firms:

(a) **A winners group** of SBRI Phase 1 (and a small number of Phase 2) winners which won support from SBRI during the September 2010 to September 2012 period and will therefore have potentially benefitted from both completing the application procedure for SBRI Phase 1 support and subsequently receiving funding;

(b) **An applicant group** for SBRI support who applied during the September 2010 to September 2012 period and will have potentially benefitted from the application procedure and any support offered by Innovate UK and other sponsoring departments as part of the competition; and,

(c) **A non-applicant group** similar in characteristics (sector, size) to the combined applicant and winner group but who did not apply to or benefit from SBRI over the September 2010 to September 2012 period.

Comparison of the performance of the winners group with the non-applicant group will provide an estimate of the impact of the whole SBRI process. Comparison of the performance of the applicant group and the non-applicant group will provide an estimate of the impact of the application process itself and help to isolate any differences between the applicant and non-applicant groups.

Notions of ‘impact’ in evaluation of public support have typically resolved around scheme cost-benefits and notions of net present value. In the surveys conducted here we measure additionality at the project and scheme level, also reflecting notions of partial additionality, and measure broader impacts on firm performance. More recently, however, notions of behavioural additionality have also been introduced reflecting the potential for policy support to change firms’ attitudes to innovation, the way in which firms go about innovating and/or the partners they work with (37) ⁶. In the surveys we reflect these potential changes by measuring:

- The probability that firms will innovate in products(s), strategy and/or marketing over the next three years;
- The probability of cooperation with different types of innovation partners;

⁵ The alternative is random allocation where support is randomly allocated and is therefore unrelated to recipient characteristics. This is the basis for randomised control trials such as that being implemented for Growth Vouchers (www.greatbusiness.gov.uk/growthvouchers).

- Strategic benefits in terms of, for example, increased awareness of the public sector as a lead customer, expanded innovation networks or improved access to specialist skills, equipment or facilities;
- The impact of SBRI on attitudes to innovation within the firm and the support offered to innovation by senior management.

A4.2.2 Sampling frame

Our aim in the evaluation survey was to assess the impact of SBRI competitions which were completed (i.e. closed) during the September 2010 to September 2012 period. This period included seventy individual SBRI competitions. 38 run by various departments and Innovate UK and a further 32 competitions run by the MOD. Of the 38 competitions run outside the MOD, 25 were run by Innovate UK. We aimed to measure the impact on recipient firms over the subsequent two years (i.e. October 2012 to September 2014).

A number of informational and regulatory issues arose in constructing the sampling frames for both the evaluation survey described in this section and the Baseline Survey described later in this Annex.

First, no single database of SBRI applicants or winners exists which pulls together information from individual departments and Innovate UK. Instead, each department organising a competition holds applicant and winner data in its own database or CRM system with no standardised data requirements and no requirements to provide applicant and winner contact or contextual data to Innovate UK. Instead, returns are limited to summary information (e.g. number of applications, value of competition etc.) which forms part of Innovate UK's management data. It also became clear during the early stages of the evaluation that the degree of detail and accessibility of the information held by departments varies depending on individual departmental requirements and norms. In terms of the evaluation survey this meant that:

- (a) Data on the applicants and winners of each competition had to be requested from each department separately and then collated by the project team;
- (b) Data held by departments was not always available in full and, where it was available, did not accord to any standard format. For example, consistent indicators were not available for the size and or sector of individual SBRI applicants.

In terms of the departmental competitions, building the sampling frame of applicants/winners therefore involved the following steps:

- The research team developed a data pro-forma detailing the information required on each applicant/winner.
- Departmental contacts – those individuals running the competitions in each department – were approached by Innovate UK to provide information on their applicants/winners.

- Information on applicants/winners was provided by the majority of departments and integrated into a single applicant/winner sampling frame by the research team⁷.

Second, for those competitions run directly by Innovate UK there is also no co-ordinated database of SBRI applicants and/or competition winners. Instead, reflecting the application process for the scheme, individual applications are held as Word files (one for each application) and needed to be accessed individually by the research team to identify firm contact details for the survey. There is also no clear delineation in the records relating to those applications which were successful. This information is held separately. For those competitions operated by Innovate UK, compiling a list of applicants/winners therefore involved the following steps:

- Innovate UK staff created an accessible website containing all applicant data. Data for each competition was held in a separate directory with sub-directories containing individual applications in Word format.
- Individual files for each applicant were accessed manually by the research team and contact and contextual data extracted.
- Information on winners for each competition was provided separately and integrated into the list of applicants.

Applicant information was available for all of the competitions operated by Innovate UK.

Third, particular issues were encountered by the research team in accessing complete applicant and winner data for those competitions run by the MOD. Information was requested from MOD in a similar way to that from the other departments operating SBRI. MOD adopted a different approach to providing information, however, preferring an opt-in approach and approached around 200 main suppliers who had applied to SBRI to seek their engagement with the evaluation. 14 of these firms responded positively and a report on qualitative feedback from these firms is included in Annex 7.

Fourth, no provision is made in either the terms and conditions which firms agree to when they apply for SBRI support (either in the departmental competitions or those run by Innovate UK) to allow for follow-up by subsequent evaluations. Similarly, no such condition is included in contract offer letters to permit Innovate UK to provide contact data directly to any evaluation team. For both departmental competitions and those run by Innovate UK an initial approach had therefore to be made to all applicants and winners by either Innovate UK or the sponsoring department seeking their permission to be contacted by the research team or offering them an opt-out from such contacts. In terms of the departmental competitions this pre-contact involved the following steps:

- The research team provided Innovate UK with a draft email outlining the purpose of the evaluation and the potential for opting-out of the evaluation;
- Innovate UK forwarded this to departmental contacts with a request to send out emails to each applicant/winner to notify them of the evaluation and allow opt-out by a specific date. Firms not responding within a given date were deemed not to have opted out. Note also however, that where emails 'bounced-back' or were undeliverable it was assumed that no contact had been made and these too were treated as opt-outs.

⁷ Information on applicants proved unavailable for six departmental competitions (SB RI_FSA_45 ,SBRI_OS_66, SBRI_FSA_82 SBRI_SPACE_103, SBRI_DECC_104, SBRI_FSA_116).

- Departments then co-ordinated and forwarded responses to Innovate UK and these were then collated and provided to the research team.
- The research team then removed both opt-outs and bounce-backs from the sampling frame.

For the Innovate UK competitions the steps followed were similar without the link to the external department.

Once the final sampling frame had been completed, removing any opt-outs or bounce-backs, a process of de-duplication was undertaken in order to avoid individual firms being questioned about more than one application/win. The guiding principle adopted here was to preserve contacts which had won SBRI to maximise the potential number of responses from winners.

A4.2.3 Control group

The aim here was to match the control group as closely as possible to the size and sector of the combined applicants and winners group. Data on firm size was available for around 1,880 SBRI applicants in the target groups for the Evaluation and Baseline Surveys Table 54 Size Analysis of (non-MOD) SBRI Applicants. Of these around half had fewer than 10 employees. A quarter of applicant firms had more than 250 employees.

Table 54 Size Analysis of (non-MOD) SBRI Applicants

	Applicants 2011-12	Applicants 2013-14	Total
A. No. of firms			
Fewer than 10 employees	427	513	940
10-50 employees	185	162	347
50-250 employees	78	50	128
250 plus employees	243	220	463
Total	933	945	1878
B. Percentage			
Fewer than 10 employees	45.8	54.3	50.1
10-50 employees	19.8	17.1	18.5
50-250 employees	8.4	5.3	6.8
250 plus employees	26.0	23.3	24.7
Total	100.0	100.0	100.0

(Source: Innovate UK and departmental administrative data)

Little consistent data was available from the data provided to the research team in terms of the sectoral classification of firms. As part of the process of identifying an appropriate control group, individual firms were therefore matched (by name) with the Experian database. It proved possible to match around 1600 SBRI applicants from both Survey A and B. Eliminating some sectors where small numbers of applicants (<1%) were located suggested the distribution in Table 55. The table shows that the largest main sector from which applications came as the information and communication sector. This was followed by the

professional, scientific and technical activities sector and then the administrative and support series activities sector. The area of which the least number of applications came was the real estate activities sector. No significant differences between the two periods in terms of the number of applications received from a sector were noted.

Table 55 Sectoral analysis of (non-MOD) SBRI applicants (SIC 2007)

	Applicants 2011-12	Applicants 2013-14	Total
A. No. of firms			
Manufacturing	71	63	134
Construction	10	9	19
Wholesale and retail trade; repair of motor vehicles and motor cycles	48	43	91
Information and communication	239	273	512
Real estate activities	13	2	15
Professional, scientific and technical activities	212	203	415
Administrative and support service activities	101	113	214
Education	21	10	31
Human health and social work activities	70	69	139
Other service activities	22	16	38
TOTAL	807	801	1608
B. Percentage			
Manufacturing	8.80	7.87	8.33
Construction	1.24	1.12	1.18
Wholesale and retail trade; repair of motor vehicles and motor cycles	5.95	5.37	5.66
Information and communication	29.62	34.08	31.84
Real estate activities	1.61	0.25	0.93
Professional, scientific and technical activities	26.27	25.34	25.81
Administrative and support service activities	12.52	14.11	13.31
Education	2.60	1.25	1.93
Human health and social work activities	8.67	8.61	8.64
Other service activities	2.73	2.00	2.36
TOTAL	100.00	100.00	100.00

(Source: Authors' name match of SBRI applicants with Experian database (see text for details))

A4.2.4 Survey instrument

The evaluation survey was undertaken using CATI. The survey instrument is included in full in Annex 4 and has three main sections:

- Section A seeks details of the respondents' profile including information on the date of establishment of the business, industry, size and indicators designed to enable the assessment of displacement and multipliers.
- Section B focuses on the journey of the business through the scheme, beginning with how the business first heard about the scheme through the Phase 1 (and potentially Phase 2) application procedures and any other support received.
- Section C focuses on measuring the impact of the initiative on the recipient firm using measures of both additionality and behavioural additionality.

A4.2.5 Piloting

The questionnaire was piloted with six SBRI applicants, three Phase 1 winners and one Phase 2 winner. Questions generally worked well but some questions had to be dropped due to the overall length of the original questionnaire.

A4.3 The Baseline Survey

A4.3.1 Survey aims and objectives

In parallel to the evaluation survey we also undertook a baseline survey of SBRI applicants, winners and a control group which is intended to provide the basis for future follow-up. Here the specific objective was to gather information on those firms which were applicants and winners in competitions which were completed over the September 2012 to April 2014 period. The evaluation survey focussed on the characteristics of the business and the journey of the businesses through the SBRI. No data on impact was sought in this survey.

Over the period covered by the Baseline Survey, 82 SBRI competitions were completed of which 57 were run by various government departments and Innovate UK. 25 competitions were operated by the MOD. Of the 57 competitions run outside the MOD 30 were run by Innovate UK who also provided information for the evaluation. As with the evaluation survey no information was available for the MOD competitions and so they are excluded from the Baseline Survey. Information was also unavailable for a number of the departmental competitions.

A4.3.2 Sampling frame, control group and survey instrument

Essentially similar issues arose in the development of a sampling frame for the Baseline Survey as for the evaluation survey. Again the key issues were the lack of any scheme-wide unified applicant and recipient database and any provision in the application process which allowed follow-up of applicants by evaluators.

The control group for the Baseline Survey was defined in a similar way to that for the evaluation survey. The survey instrument for the Baseline Survey comprised Sections A and B of the evaluation survey questionnaire (Annex 4).

A4.4 Survey conduct and response

The various difficulties encountered in developing the sampling frame for the Evaluation and Baseline survey inevitably restricted the sample available for both surveys. The impact of the different issues faced is illustrated in Table 56. From an original sample of 2,832, around a third of the potential sampling frame was lost due to removing opt-outs (-11.0 per cent) and duplicates (26.6 per cent). The impact of

removing duplicates was particularly significant in the case of SBRI as many firms had made applications in multiple competitions. In schemes where fewer calls for proposals are made this impact might have been smaller.

A number of operational factors related to the general cleaning of the sample removed a further 10 per cent from the available sample. Some opt-outs were notified late in the process and these and the removal of one completion from the sampling frame, as it proved impossible to contact applicants prior to the survey start date, resulted in a final available sample which included around half of all SBRI applicants and winners.

Table 56 Sample losses among SBRI applicants (Evaluation and Baseline surveys combined)

	Sample numbers	Sample percentage
Total records provided	2832	100.0
Duplicate company/contact name removed	-754	-26.6
Opt outs/bounce backs removed	-312	-11.0
Total after de-duplicating/opt-outs	1766	62.4
Cleaning of database		
Overseas number	-63	-2.2
Company dissolved (looked up in pilot)	-15	-0.5
Attempted lookup for pilot and no number found	-24	-0.8
No telephone number	-128	-4.5
Total after cleaning	1536	54.2
Further late removals		
Further opt-outs/bounce backs	-29	-1.0
Competition NHS 71 removed	-93	-3.3
FINAL SAMPLE AVAILABLE	1414	49.9

(Source: Evaluation and Baseline surveys)

These 1414 firms therefore represented the sampling frame carried forward into the company surveys. Table 57 reports the outcomes. For example, among the 482 unsuccessful applicants in the evaluation survey included in the final sampling frame 155 were unusable as contact details were either incorrect or the telephone number provided was unobtainable after several tries. This left a usable sample of 325 of which 174 completed interviews were achieved, a response rate of 54 per cent. Similar or higher response rates were achieved for the other sample groups.

Table 57 Response rates among applicants for the Evaluation and Baseline Surveys

	evaluation survey		Baseline Survey	
	Non-winners	Winners	Non-winners	Winners
	482	88	666	178
Further duplicates/opt outs/unusable identified in CATI load	2	4	4	0
	evaluation survey		Baseline Survey	
	Non-winners	Winners	Non-winners	Winners
Total sample loaded onto CATI	480	84	662	178
Unusable	155	12	87	19
- Telephone number unobtainable, contact details incorrect	134	8	70	17
- Did not recall/apply for SBRI support	19	3	9	1
Useable	325	72	575	159
- Completes	174	48	299	110
Response rate	54%	67%	52%	69%
Refusal rate	16%	11%	7%	4%

(Source: Evaluation and Baseline surveys)

A4.5 Derivation of sampling weights

In this section we describe the derivation of sampling weights for both the evaluation survey and the Benchmark Survey. In both cases the aim is to derive a set of weights which allow representative results to be produced for the applicant and winners groups. Weighting is necessary primarily because of differential survey response between firms in the different size bands and sectors covered by the SBRI. Using survey responses in an un-weighted form would provide un-representative results, over-representing those groups of firms where sample response was greatest.

The derivation of weights follows the standard procedure. First, we specify the structure of the target population for the survey for each target group (control, applicants and winners). This is followed by a comparison between the achieved response and the target population which gives the achieved sampling fractions in each sector/sizeband cell. The weights are derived as the reciprocal of the achieved sampling fractions.

A4.5.1 Deriving sampling weights

Combining the proportion of applicants in each size band (Table 54) and sector (Table 55) suggests the overall profile in (Table 58). This provides the target population for weighting. One issue which arises here is the relatively small proportion of firms in some sizeband/sectoral cells and the potential for zero cell sizes in the relatively small samples or extreme weights where cells contain a small number of observations. We therefore aggregate the profile in Table 58 into three broad sectors to create cells across which weights are likely to be more even (Table 58, part B). We then derive weights across these three sectoral groupings and four sizeband categories. Table 59 summarises the distribution of the achieved sample across these twelve sector/sizeband cells, and Table 60 reports the related sampling weights for the evaluation survey. An essentially similar procedure was followed for the Baseline Survey: Table 61 summarises the target population for the Baseline Survey; Table 62 gives the respondent profile for this survey; and, Table 63 gives the relevant weights.

Table 58 Composition of the target population of applicants: Evaluation Survey, % firms

		Employment Size band				
		<10	10-49	50-249	250+	Total
A. Detailed breakdown						
C	Manufacturing	4.0	1.7	0.7	2.3	8.8
D	Construction	0.6	0.2	0.1	0.3	1.2
G	Wholesale and retail trade; repair of motor vehicles and motor cycles	2.7	1.2	0.5	1.5	6.0
J	Information and communication	13.6	5.9	2.5	7.7	29.6
L	Real estate activities	0.7	0.3	0.1	0.4	1.6
M	Professional, scientific and technical activities	12.0	5.2	2.2	6.8	26.3
N	Administrative and support service activities	5.7	2.5	1.1	3.3	12.5
P	Education	1.2	0.5	0.2	0.7	2.6
Q	Human health and social work activities	4.0	1.7	0.7	2.3	8.7
S	Other service activities	1.3	0.5	0.2	0.7	2.7
TOTAL		45.8	19.8	8.4	26.0	100.0
B. Summary breakdown						
C,D,F	Manufacturing etc.	4.6	2.0	0.8	2.6	10.0
J,M	Business services	25.6	11.1	4.7	14.5	55.9
G,H,I, N-S	Other services	15.6	6.7	2.9	8.9	34.1
Total		45.8	19.8	8.4	26.0	100.0

(Source: study team)

Table 59 Composition of respondents to Evaluation Survey: By summary sector and size band

	Employment Size band				TOTAL
	<10	10-49	50-249	250+	
A: SBRI Non-winners (N=174)					
C,D,F - Manufacturing etc.	4.0	2.3	0.6	0.6	7.5
J,M - Business services	28.7	14.9	4.6	9.2	57.5
G,H,I, N-S - Other services	10.3	7.5	6.9	10.3	35.1
Total	43.1	24.7	12.1	20.1	100.0
B: SBRI winners (N=48)					
C,D,F - Manufacturing etc.	4.2	2.1	2.1	4.2	12.5
J,M - Business services	29.2	16.7	2.1	4.2	52.1
G,H,I, N-S - Other services	12.5	6.3	4.2	12.5	35.4
Total	45.8	25.0	8.3	20.8	100.0
C: Control group (N=359)					
C,D,F - Manufacturing etc.	7.5	1.9	0.6	0.8	10.9
J,M - Business services	41.2	14.8	2.5	3.3	61.8
G,H,I, N-S - Other services	13.6	6.7	4.7	2.2	27.3
Total	62.4	23.4	7.8	6.4	100.0

(Source: Company survey data.)

Table 60 Weights by Size band and broad sector: Evaluation Survey

	Employment Size band				TOTAL
	<10	10-49	50-249	250+	
A: SBRI Non-winners (N=174)					
C,D,F - Manufacturing etc.	1.1	0.9	1.5	4.5	1.3
J,M - Business services	0.9	0.7	1.0	1.6	1.0
G,H,I, N-S - Other services	1.5	0.9	0.4	0.9	1.0
Total	1.1	0.8	0.7	1.3	1.0
B: SBRI winners (N=48)					
C,D,F - Manufacturing etc.	1.1	1.0	0.4	0.6	0.8
J,M - Business services	0.9	0.7	2.3	3.5	1.1
G,H,I, N-S - Other services	1.2	1.1	0.7	0.7	1.0
Total	1.0	0.8	1.0	1.2	1.0
C: Control group (N=359)					
C,D,F - Manufacturing etc.	0.6	1.0	1.5	3.1	0.9
J,M - Business services	0.6	0.7	1.9	4.3	0.9
G,H,I, N-S - Other services	1.1	1.0	0.6	4.0	1.2
Total	0.7	0.8	1.1	4.1	1.0

(Source: study team)

Table 61 Composition of the target population of applicants: Baseline Survey, % firms

		Employment Size band				
		<10	10-49	50-249	250+	Total
A. Detailed breakdown						
C	Manufacturing	4.3	1.3	0.4	1.8	7.9
D	Construction	0.6	0.2	0.1	0.3	1.1
G	Wholesale and retail trade; repair of motor vehicles and motor cycles	2.9	0.9	0.3	1.3	5.4
J	Information and communication	18.5	5.8	1.8	7.9	34.1
L	Real estate activities	0.1	0.0	0.0	0.1	0.3
M	Professional, scientific and technical activities	13.8	4.3	1.3	5.9	25.3
N	Administrative and support service activities	7.7	2.4	0.7	3.3	14.1
P	Education	0.7	0.2	0.1	0.3	1.3
Q	Human health and social work activities	4.7	1.5	0.5	2.0	8.6
S	Other service activities	1.1	0.3	0.1	0.5	2.0
TOTAL		54.3	17.1	5.3	23.3	100.0
B. Summary breakdown						
C,D,F	Manufacturing etc.	4.9	1.5	0.5	2.1	9.0
J,M	Business services	32.3	10.2	3.1	13.8	59.4
G,H,I, N-S	Other services	17.2	5.4	1.7	7.4	31.6
Total		54.3	17.1	5.3	23.3	100.0

(Source: study team)

Table 62 Composition of respondents to Baseline Survey: By summary sector and size band

	Employment Size band				TOTAL
	<10	10-49	50-249	250+	
A: SBRI Non-winners (N=299)					
C,D,F - Manufacturing etc.	2.2	0.0	0.0	3.2	5.4
J,M - Business services	37.6	12.9	6.5	6.5	63.4
G,H,I, N-S - Other services	5.4	5.4	2.2	18.3	31.2
Total	45.2	18.3	8.6	28.0	100.0
B: SBRI winners (N=110)					
C,D,F - Manufacturing etc.	1.8	0.0	0.9	2.7	5.5
J,M - Business services	34.5	11.8	6.4	7.3	60.0
G,H,I, N-S - Other services	4.5	4.5	2.7	22.7	34.5
Total	40.9	16.4	10.0	32.7	100.0
C: Control group (N=236)					
C,D,F - Manufacturing etc.	5.9	1.7	0.0	1.3	8.9
J,M - Business services	44.5	14.0	2.1	3.8	64.4
G,H,I, N-S - Other services	16.1	7.2	1.3	2.1	26.7
Total	66.5	22.9	3.4	7.2	100.0

(Source: Company survey data.)

Table 63 Weights by Size band and broad sector: Baseline Survey

	Employment Size band				TOTAL
	<10	10-49	50-249	250+	
A: SBRI Non-winners (N=299)					
C,D,F - Manufacturing etc.	1.04	0.92	0.36	6.26	1.12
J,M - Business services	0.90	1.05	1.57	5.17	1.18
G,H,I, N-S - Other services	0.75	0.90	1.67	0.61	0.76
Total	0.86	0.98	1.22	1.55	1.00
B: SBRI winners (N=110)					
C,D,F - Manufacturing etc.	2.68	1.00	0.52	0.77	1.65
J,M - Business services	0.93	0.86	0.49	1.90	0.99
G,H,I, N-S - Other services	3.77	1.19	0.61	0.32	0.91
Total	1.33	1.05	0.53	0.71	1.00
C: Control group (N=236)					
C,D,F - Manufacturing etc.	0.82	0.91	1.00	1.65	1.01
J,M - Business services	0.73	0.73	1.49	3.63	0.92
G,H,I, N-S - Other services	1.07	0.75	1.32	3.47	1.18
Total	0.8	0.7	1.6	3.2	1.0

(Source: study team)

SBRI EVALUATION QUESTIONNAIRE

June 2014

Manchester Institute of Innovation Research, Warwick Business School and OMB Research for the Technology Strategy Board

SAMPLE GROUPS:

X1 – 2011-12 applicants, unsuccessful

X2 – 2011-12 Phase 1 winners only

X3 – 2011-12 Phase 1 and Phase 2 winners

X2/X3 – 2011-12 unsure if just Phase 1 or Phase 1 & Phase 2 winners

Y – 2011-12 Control group

IF SAMPLE GROUP X1, X2 OR X3

Ask for named respondent

Good morning/afternoon, my name is ... and I'm calling from OMB Research, an independent market research agency, working alongside Manchester Institute of Innovation Research. We have recently been commissioned by the Technology Strategy Board to conduct an evaluation of the Small Business Research Initiative or SBRI.

IF SAMPLE GROUP X1

We believe you applied to the SBRI for support to conduct some proof of concept work...

IF SAMPLE GROUP X2 OR X2/X3

We believe you received support through the SBRI to conduct some proof of concept work...

IF SAMPLE GROUP X3

We believe you received support through the SBRI to conduct some proof of concept work and then subsequent support for prototype development.

ASK IF COMPETITION TITLE ON SAMPLE

The competition title was <"COMPETITION TITLE">.

IF PROJECT TITLE ON SAMPLE

The project title was <"PROJECT TITLE">.

IF DEPARTMENT ON SAMPLE

And this was an open competition for <INSERT DEPARTMENT NAME>.

IF SAMPLE GROUP X1, X2 OR X3 OR X2/X3

This research will cover your use of SBRI. It will take around <IF X1 15/IF X2 OR X3 OR X2/X3 20> minutes, depending on your answers. Is it convenient to speak to you now or would you prefer to make an appointment for another time?

IF SAMPLE GROUP Y

Could I speak to the owner/managing director or the person responsible for product or service development within your business?

Good morning/afternoon, my name is ... and I'm calling from OMB Research, an independent market research agency, working alongside Manchester Institute of Innovation Research. We have been commissioned by the Technology Strategy Board to conduct some research to look at the types of support used by businesses when they develop new products or services.

This research will cover areas such as your use of any business support services, the impact they have had on your firm, and your general business performance. It should take around 15 minutes, depending on your answers. Is it convenient to speak to you now or would you prefer to make an appointment for another time?

ADD AS NECESSARY: It doesn't matter if you haven't used any support services as part of your development of new products or services we are still very much interested in your views

FOR ALL SAMPLE GROUPS ADD IF NECESSARY

- i. The research is being conducted under the Code of Practice of the Market Research Society, which means that all of the answers you give are strictly confidential and anonymous. Participation in this survey is voluntary.**
- 2. The responses of all organisations taking part will be combined into a statistical report**

- **Your business was selected at random** <IF X1-X3: from a list supplied by the Technology Strategy Board / IF Y: from a list of all UK businesses >
- **IF Y: If you would like to find out more about TSB support for innovation you can visit** <https://www.innovateuk.org/>

OFFER FAX/EMAIL REASSURANCE IF NECESSARY

If you wish to check that OMB Research is a bona fide market research agency, you can contact the Market Research Society on 0500 396999, or call Michael Farrer at OMB Research on 01732 220582 or Stephen Browning at the Technology Strategy Board on 01793 442700 or stephen.browning@tsb.gov.uk

SECTION S: SCREENING

IF SAMPLE GROUP X1

S1 First of all, can I confirm that your firm applied for support from SBRI to help you develop a new product/service during the period 2009-2012?

AS NECESSARY: This would have been part of an open competition around a particular technology challenge.

AS NECESSARY: I'm aware that the project was unsuccessful in terms of achieving SBRI support but we are still keen to understand your views on the application process and whether the project continued without the SBRI support.

ASK IF COMPETITION TITLE ON SAMPLE

AS NECESSARY: The competition title was <"COMPETITION TITLE">.

IF PROJECT TITLE ON SAMPLE

AS NECESSARY: The project title was <"PROJECT TITLE">.

Yes 1

No 2 CLOSE

(Don't know) 3 ASK FOR REFERAL

IF SAMPLE GROUP X2 OR X2/X3

S2 We understand from our records that between 2009 and 2012 your firm received support from SBRI for proof of concept < IF X2/X3 or prototype> development.

AS NECESSARY This would have been part of an open competition around a particular technology challenge and might have been described as 'Phase 1' < IF X2/X3 and/or 'Phase 2'> support.

ASK IF COMPETITION TITLE ON SAMPLE

AS NECESSARY: The competition title was <"COMPETITION TITLE">.

IF PROJECT TITLE ON SAMPLE

AS NECESSARY: The project title was <"PROJECT TITLE">.

Yes 1

No 2 CLOSE

(Don't know) 3 ASK FOR REFERRAL

IF SAMPLE GROUP X3

S3 We understand from our records that between 2009 and 2012 your firm received support from SBRI for proof of concept development and went on to get subsequent support for prototype development.

AS NECESSARY This would have been part of an open competition around a particular technology challenge and might have been described as 'Phase 1' and 'Phase 2' support.

ASK IF COMPETITION TITLE ON SAMPLE

AS NECESSARY: The competition title was <"COMPETITION TITLE">.

IF PROJECT TITLE ON SAMPLE

AS NECESSARY: The project title was <"PROJECT TITLE">.

Yes 1

No 2 CLOSE

(Don't know) 3 ASK FOR REFERRAL

ASK IF Y

S4 – And can I just confirm that you are the owner, managing director or one of the people best qualified to talk about your company’s product or service development activity?

- Yes1
- No – take referral and being transferred.....2
- No – take referral and arrange call back.....3
- No – refused referral.....4 - CLOSE

ASK Y

S5a First of all can I ask what year your business was first established?

AS NECESSARY: **This means when the business started trading**

AS NECESSARY: **If the business is a subsidiary this refers to the subsidiary in which you work**

Type in year (e.g. 1995) - CLOSE IF GROUP Y AND AFTER 2012

(Don’t know)

(Refused)

ASK Y IF DON’T KNOW/REFUSED AT S5A

S5b If you had to say when your business was first established would you say it was?

- Within the last year 1 - CLOSE
- Over 1, up to 2 years ago2 - CLOSE
- Over 2, up to 3 years ago3
- Over 3, up to 4 years ago4
- Over 4, up to 5 years ago5
- Over 5, up to 10 years ago 6

Over 10, up to 20 years ago 7

Over 20 years ago 8

(Not yet trading)⁹ - CLOSE

(Don't know) 10

(Refused) 11

IF YEAR AT S5A >2012 OR S5B = 1-2 – SHOW CLOSE SCREEN

Thank you for your time but unfortunately on this occasion we are only interested in speaking to businesses established in 2012 or earlier.

SECTION A: RESPONDENT PROFILE

ASK ALL

I'd now like to start by asking you some questions about the background to your business.

ASK X1, X2 & X3 OR X2/X3

A1a In what year was your business first established?

AS NECESSARY: This means when the business started trading

AS NECESSARY: If the business is a subsidiary this refers to the subsidiary in which you work

Type in year (e.g. 1995)

(Don't know)

(Refused)

ASK X1, X2 & X3 OR X2/X3 IF DON'T KNOW/REFUSED AT A1A

A1b If you had to say when your business was first established would you say it was?

Within the last year 1

Over 1, up to 2 years ago 2

Over 2, up to 3 years ago 3

Over 3, up to 4 years ago 4

Over 4, up to 5 years ago 5

Over 5, up to 10 years ago 6

Over 10, up to 20 years ago 7

Over 20 years ago 8

(Not yet trading) 9

(Don't know) 10

(Refused) 11

ASK X1, X2 & X3 OR X2/X3

A6 What is the main activity of your business...? RECORD VERBATIM. PROBE FOR INDUSTRY TYPE – IF MANUFACTURING, WHAT TYPE OF MANUFACTURING?

RESPONSES TO BE CODED TO 1 LEVEL SIC AS FOLLOWS:

- A – Agriculture, forestry & fishing 1
- B – Mining & quarrying 2
- C – Manufacturing 3
- D – Electricity, gas, steam & air conditioning supply 4
- E – Water supply, sewerage, waste management & remediation activities 5
- F – Construction 6
- G – Wholesale & retail trade; Repair of motor vehicles & motorcycles 7
- H – Transport & storage 8
- I – Accommodation & food service activities 9
- J – Information & communication 10
- K – Financial & insurance activities 11
- L – Real estate activities 12
- M – Professional, scientific & technical activities 13
- N – Administrative & support service activities 14
- O – Public administration & defence; Compulsory social security 15
- P – Education 16
- Q – Human health & social work activities 17
- R – Arts, entertainment & recreation 18

- S – Other service activities 19
- T – Activities of households as employers 20
- U – Activities of extraterritorial organisations and bodies 21

ASK ALL

A2 Is your business...?

READ OUT. SINGLE CODE

- An independent business with no subsidiaries 1
- A business with subsidiaries 2
- Or, a subsidiary of another business 3
- (Other (SPECIFY)) 4
- (Don't know) 5
- (Refused) 6

ASK ALL

A3 How many people are currently employed by your business?

Write in number of employees

(Don't know)

(Refused)

IF DON'T KNOW AT A3

A3a If you had to estimate, approximately how many people are employed by your business...?

READ OUT

- No employees 1

1-4	2
5-9	3
10-19	4
20-49	5
50-99	6
100-199	7
200-249	8
250-499	9
500 or more	10
(Don't know)	11
(Refused)	12

ASK ALL

A4a Over the last 2 years, has the number of people employed by your business...?

READ OUT. SINGLE CODE

- Increased 1
- Decreased 2
- Or, stayed exactly the same 3
- (Don't know) 4
- (Refused) 5

IF INCREASED OR DECREASED (CODES 1-2 AT A4a)

A4b How many people were employed by your business two years ago?

AS NECESSARY: **Please just give me your best estimate**

Write in number (ALLOW ZERO)

- (Refused)
- (Don't know)

IF DON'T KNOW AT A4b

A4c If you had to estimate, approximately how many people were employed by your business two years ago...?

READ OUT

- No employees 1
- 1-4 2
- 5-9 3
- 10-19 4
- 20-49 5

50-99	6
100-199	7
200-249	8
250-499	9
500 or more	10
(Don't know)	11
(Refused)	12

ASK ALL

A4d **What percentage of your employees have a degree level qualification or higher? Would it be...?** READ OUT AS NECESSARY:

0-4 per cent	1
5-9 per cent	2
10-19 per cent	3
20-49 per cent	4
50 per cent or more	5
(Don't know)	6
(Refused)	7

ASK ALL

A4a Can I ask, what was the annual turnover of your business for the last full financial year?

AS NECESSARY: **By this I mean your annual sales, income or receipts.**

SHOW IF A SUBSIDIARY (CODE 4 AT A2)

AS NECESSARY: **Please just give me the turnover of the subsidiary in which you work**

Write in amount in (£0+)

(Don't know amount)

(Refused)

CATI TO VALIDATE AMOUNT ENTERED USING RANGES IN A4a1

IF DON'T KNOW OR REFUSED AT A4A

A4a1 If you had to estimate your turnover, into which of the following bands would you put it?

READ OUT AS NECESSARY

More than £0 but less than £50,000	1
£50,000 but less than £100,000	2
£100,000 but less than £200,000	3
£200,000 but less than £500,000	4
£500,000 but less than £1m	5
£1m but less than £2m	6
£2m but less than £10m	7
£10m but less than £25m	8
£25m but less than £50m	9
£50m but less than £250m	10
£250m but less than £500m	11

£500m or more 12

(Don't know) 13

(Refused) 14

ASK ALL

A4a2 And over the last 2 years, has your annual turnover...?

READ OUT. SINGLE CODE

Increased 1

Decreased 2

Or, stayed exactly the same 3

(Do not have any sales/turnover) 4

(Don't know) 8

(Refused) 9

IF INCREASED OR DECREASED (CODES 1-2 AT A4a)

A4b And what was the annual turnover of your business two years ago?

AS NECESSARY: Please just give me your best estimate

Write in amount in (£0+)

(Don't know amount)

(Refused)

IF DON'T KNOW OR REFUSED AT A4B

A4c If you had to estimate your turnover from two years ago, into which of the following bands would you put it?

READ OUT AS NECESSARY

- More than £0 but less than £50,000 1
- £50,000 but less than £100,000 2
- £100,000 but less than £200,000 3
- £200,000 but less than £500,000 4
- £500,000 but less than £1m 5
- £1m but less than £2m 6
- £2m but less than £10m 7
- £10m but less than £25m 8
- £25m but less than £50m 9
- £50m but less than £250m 10
- £250m but less than £500m 11
- £500m or more 12
- (Don't know) 13
- (Refused) 14

ASK ALL

A4b I'd now like you to think about the competition that your business encounters. What percentage of your competitors are based in the UK? READ OUT AS NECESSARY

- 1-9 per cent 1
- 10 -19 per cent 2
- 20-39 per cent 3
- 40-59 per cent 4
- 60-79 per cent 5

80 per cent or more 6

(None of them (0%) – no UK based competitors) 9

(Don't know) 7

(Refused) 8

ASK ALL EXCEPT NO TURNOVER (EXCLUDE IF A4A=0 OR A4A1=13)

A7a Does your firm currently sell any of your products or services overseas?

Yes 1

No 2

(Don't know) 3

(Refused) 4

IF CODE 1 AT A7A

A7b What percentage of your current sales are made in each of the following markets?

WRITE IN % FOR EACH MARKET; CHECK ADDS UP TO 100%

	<i>Percentage of Sales</i>
UK	%
EU	%
Other Non-EU	%
Total	100%

ASK ALL

A7c Now thinking about the goods and services your business purchases. What proportion of these are sourced from within the UK?

1-9 per cent 1

10 -19 per cent 2

20-39 per cent 3

40-59 per cent 4

60-79 per cent 5

80 per cent or more 6

(None of them (0%) – no UK based purchased inputs) 9

(Don't know) 7

(Refused) 8

ASK ALL

A15 Over the last two years, have you introduced any new or significantly improved products or services?

AS NECESSARY: **e.g. Improvements in quality or distinct user benefits.**

AS NECESSARY: **Although new to the business, it does not need to be new to the market.**

Yes 1

No 2

(Don't know) 3

(Refused) 4

ASK IF A15 = 1

A15a And are these new products or services...?

READ OUT IN FULL

- New products or services introduced to the market for the first time in the last 2 years 1
- New products or services introduced by you over the last 2 years but previously sold elsewhere 2
- Products or services that were being sold by your organisation 2 years ago but that have been technically improved (in the last 2 years) 3
- Products or services that were being sold by your organisation 2 years ago but that have been aesthetically improved (in the last 2 years) 4

AS NECESSARY: *By aesthetically improved I mean products that are fundamentally the same product **BUT** there have been changes to things such as packaging or presentation*

- (Don't know) 5

ASK ALL

A16 Over the last two years have you introduced any new or significantly improved processes for producing or supplying products or services?

AS NECESSARY: Process innovations are new or significantly improved methods for the production or supply of goods or services. The innovation, although new to the business, does not need to be new to your industry. Please include all process innovations, regardless of their origin.

- Yes 1
- No 2
- (Don't know) 3
- (Refused) 4

ASK ALL

A16a Still thinking about your product, service and process changes over the last two years. Can you give me an indication of what proportion of your overall turnover you allocate to R&D and innovation activities? Would it be.... PROMPT AS NECESSARY

- Less than 2% 1
- 3-5% 2
- 6-10% 3
- 11-20% 4
- 21-50% 5
- More than 50% 6
- (Don't know) 8
- (Refused) 9

ASK IF CODE 1 AT A15 OR CODE 1 AT A16

A17. Thinking about your innovation activity over the last two years, have you co-operated on any innovation activities with any of the following?

RANDOMISE ORDER OF STATEMENTS – except leave ‘No – not co-operated with anyone’, ‘Don’t know’ & ‘Refused’ at end

1. Suppliers of equipment, materials, services or software
2. Suppliers of design or other creative services
3. Clients or customers
4. Competitors or other businesses in your industry
5. Consultants, commercial labs or private R&D institutes
6. Universities or other higher education institutions
7. Government departments or public research institutes
8. No – not co-operated with anyone (none)
9. (Don’t know)
10. (Refused)

ASK ALL

A17a Can I ask whether you are aware of the following government support schemes for R&D and innovation?

CATI TO RANDOMISE – except ‘Don’t know’ & ‘Refused’ to remain at end of list

1. Collaborative R&D grants
2. Catapult Centres
3. Innovation Vouchers
4. R&D tax credits
5. EU Framework programmes
6. Horizon 2020
7. <ASK IF Y ONLY> Small Business Research Initiative or SBRI
8. Not aware of any above - none
9. (Don’t know)
10. (Refused)

ASK ALL

C2. <IF X2 OR X3 Other than the support received from SBRI for this project,> Has your company received any support for technological development over the last five years either from the UK government or European schemes?

Yes 1

No 2

(Don’t know) 3

(Refused) 4

ASK IF YES AT C2

C2a. Which UK government or European schemes have you received funding from? DO NOT PROMPT BUT CODE AS PER PRECODES

1. Collaborative R&D grants 1
 2. Catapult Centres 2
 3. Innovation vouchers 3
 4. R&D tax credits 4
 5. EU Framework programmes 5
 6. Horizon 2020 6
 7. SBRI (for a different project/competition) 7
 8. Other – SPECIFY 8
- (Don't know) 9
- (Refused) 10

ASK FOR EACH CODES 1-8 MENTIONED AT C2a

C2b. And can you give me an indication of the amount of support you received from <INSERT SCHEME NAME FROM C2a>? Was it..?

- More than £0 but less than £5,000 1
- £5,000 but less than £20,000 2
- £20,000 but less than £50,000 3
- £50,000 but less than £250,000 4
- More than £250,000 5
- (Don't know) 8
- (Refused) 9

ASK ALL

A18 Now, thinking about the next three years. How likely are you to...?

- a. Develop new or significantly improved goods or services?
- b. Implement new or significantly changed corporate strategy?
- c. Implement changes to marketing concepts or strategies such as packaging or presentational changes to a product or service?

Very likely 1
Quite likely 2
Quite unlikely 3
Very unlikely 4
(Don't know) 5
(Refused) 6

ASK ALL

A19. Still thinking about the next three years. How likely are you to co-operate with the following innovation partners?

RANDOMISE ORDER OF STATEMENTS

- a. Suppliers of equipment, materials, services or software
- b. Clients or customers
- c. Competitors or other businesses in your industry
- d. Consultants, commercial labs or private R&D institutes
- e. Universities or other higher education institutions
- f. Government departments or public research institutes

Very likely 1
Quite likely 2
Quite unlikely 3

Very unlikely	4
(Don't know)	5
(Refused)	6

SECTION B: FIRM JOURNEY AND PROJECT OUTCOMES

I'd now like to move on and talk about your involvement with the SBRI programme <IF PROJECT TITLE ON SAMPLE and your project titled <"PROJECT TITLE">> <IF COMPETITION TITLE ON SAMPLE for the <COMPETITION TITLE> competition>.

ASK X1, X2 X3 OR X2/X3

B1 Prior to your initial application for SBRI had you previously been a supplier to the public sector?

Yes 1

No 2

(Don't know) 3

(Refused) 4

ASK X1, X2 X3 OR X2/X3

B2 How did you first hear about SBRI?

PROBE AS PER PRECODES. SINGLE CODE. DO NOT RANDOMISE ORDER

Being contacted directly by the Technology Strategy Board 1

Leaflets (including email) about the SBRI scheme 2

Through a Knowledge Transfer Network or other technology network 3

The Technology Strategy Board website 4

An event or workshop which was held by, or run in conjunction with the Technology Strategy Board or other government department 5

Brokerage or Referral from a third party 6

Other (SPECIFY) 7

(Don't know) 8

(Refused) 9

IF CODE 7 AT B2

Please code the 'other' source to the following

Bank 1

Consultant 2

Chamber of Commerce 3

Department of Business Innovation and Skills (BIS) 4

Enterprise Agency 5

Higher Education Institution (e.g. university) 6

Local Authority 7

Enterprise Europe Network 8

Another business 9

Other 10

ASK X1, X2, X3 OR X2/X3

B3. Which of the following was your main reason for seeking assistance from the SBRI?
READ OUT ALL CODES BEFORE ACCEPTING ANSWER. SINGLE CODE. RANDOMISE ORDER:

- To help your business grow 1
- To grow your sales to the public sector 2
- To get help in developing a new technology 3
- To get access to specific technical expertise 4
- To get access to new market opportunities 5
- (Other – SPECIFY) 8
- (Don't know/can't remember) 9

ASK X1, X2, X3 OR X2/X3

B4. Now thinking about the process of applying for Phase 1 SBRI support can you please tell me whether you agree or disagree with each of the following statements?

READ OUT - DO NOT RANDOMISE

- a. The pre-application consultation and information process was helpful
- b. The application process helped me to formalise the technical objectives of the project
- c. The application process seemed appropriate for the competition
- d. The application process was overly complex and time consuming

- Agree 1
- Disagree 2
- (Neither agree nor disagree) 3
- (Don't know) 4

ASK X1

B6 After your application for SBRI was unsuccessful, can you tell me whether...

READ OUT. SINGLE CODE

The project stopped completely 1

The project continued in exactly the same way as it would have done with SBRI support 2

The project continued but was modified or limited in some way 3

(Don't know) 4

(Refused) 5

ASK IF CODE 3 AT B6

B6a And did the project...?

READ OUT. MULTICODE

Proceed, but with a delayed start 1

Proceed, but more slowly than it would have done with SBRI support 2

Proceed, but with less of your time or resources invested 3

(Don't know) 4

(Refused) 5

ASK X2 AND X3 AND X2/X3

B7 Thinking about your Phase 1 SBRI project, the proof of concept stage, would you say that...?

ASK IF COMPETITION TITLE ON SAMPLE

AS NECESSARY: The competition title was <"COMPETITION TITLE">.

IF PROJECT TITLE ON SAMPLE

AS NECESSARY: The project title was <"PROJECT TITLE">.

- Phase 1 achieved all of its key objectives 1
- Phase 1 met the majority of its objectives 2
- Phase 1 met some of its objectives 3
- Phase 1 met none of its objectives 4
- (Don't know) 5
- (Refused) 6

ASK IF CODES 2,3,4 AT B7

B8 How significant were the following barriers in preventing your Phase 1 SBRI project from achieving all of its objectives? For each one, please could you give me a score of 1 to 5, where 1 means it had 'no impact at all' and 5 means it has had a 'very significant impact'. So firstly...?

READ OUT. CATI TO ROTATE – ALWAYS ASK A & B TOGETHER AND H & I TOGETHER.

REMIND AS NECESSARY

To what extent was this a barrier in preventing you from achieving all of the project objectives?

- a. The level of financial support available from the SBRI scheme
- b. Lack of finance from other sources
- c. Legislative or regulatory requirements
- d. Unanticipated difficulties with the technology involved
- e. Short time scale of the project
- f. Lack of partners
- g. Lack of technical expertise in your business
- h. Lack of managerial expertise in your business
- i. Lack of clarity in the project specification
- j. Lack of interaction with <INSERT DEPARTMENT FROM SAMPLE>

1 – No impact at all 1

2 2

3 3

4 4

5 – Very significant impact 5

(Don't know) 8

(Not applicable) 9

ASK X2 AND X3 AND X2/X3

Now I would like to ask some questions about your experience with Phase 2 of the SBRI project – the prototyping phase.

B10 AND B10C – MOVED FORWARD TO HERE

ASK X2 ONLY

B10 According to our records, your application for Phase 2 support from SBRI was turned down. Is this correct?

Yes 1

No 2

(Did not actually apply for second phase) 5

(Don't know) 3

(Refused) 4

ASK X2/X3 ONLY

B10d Did you apply for Phase 2 support from SBRI?

AS NECESSARY: By 'Phase 2' I mean prototype development support

Yes 1

No 2

(Don't know) 3

(Refused) 4

ASK IF CODE 2 AT B10 OR CODE 1, 3 OR 4 AT B10D

B10c <IF CODE 2 AT B10 So just to clarify,/IF CODE 1,3 OR 4 AT B10D And> have you received any Phase 2 support from SBRI for this project?

ASK IF COMPETITION TITLE ON SAMPLE

AS NECESSARY: The competition title was <"COMPETITION TITLE">.

IF PROJECT TITLE ON SAMPLE

AS NECESSARY: The project title was <"PROJECT TITLE">.

Yes 1 – FOLLOW X3 ROUTING

No 2

(Don't know) 3

(Refused) 4

ASK X2 (EXCEPT IF B10=5) AND X3 AND X2/X3 (EXCEPT IF B10D=2)

B9 Thinking about the process of applying for Phase 2 SBRI support can you please tell me whether you agree or disagree with each of the following statements?

READ OUT. DO NOT RANDOMISE.

- a. The Phase 2 application process helped me formalise the technical objectives of the project?
- b. The application process challenged my idea and made me give it more detailed consideration?
- c. The application process was overly complex and time consuming?

Agree 1

Disagree 2

(Neither agree nor disagree) 3

(Don't know) 4

(Refused) 5

ASK IF CODES 1, 3, 4 OR 5 AT B10 OR CODES 2,3 OR 4 AT B10C OR CODE 2 AT B10D

B10a <IF CODE 1 AT B10 **After your application for Phase 2 support was turned down,> can you tell me whether...**

READ OUT. SINGLE CODE

The project stopped completely 1

The project continued but was modified/limited in some way 3

The project continued in exactly the same way as it would have done with SBRI support 2

(Don't know) 4

(Refused) 5

ASK IF CODE 3 AT B10A

B10b And did the project...?

(MULTI CODE) READ OUT. YES/NO

Proceed, but with a delayed start 1

Proceed, but more slowly than it would have done with SBRI support 2

Proceed, but with less of your time or resources invested 3

(Other) 6

(Don't know) 4

(Refused) 5

ASK X3 AND (X2 OR X3/X4 IF CODE 1 B10C)

B11 Thinking about your Phase 2 SBRI project – the prototyping stage – would you say that...

READ OUT – SINGLE CODE

Phase 2 achieved all of its key objectives 1

Phase 2 met the majority of its objectives 2

Phase 2 met some of its objectives 3

Phase 2 met none of its objectives 4

(Don't know) 5

(Refused) 6

ASK IF CODES 2,3,4 AT B11

B11a And, how significant were the following barriers in preventing your Phase 2 SBRI project from achieving all of its objectives. For each one, please could you give me a score of 1 to 5, where 1 means it had 'no impact at all' and 5 means it had a 'very significant impact'. So firstly...?

READ OUT. CATI TO ROTATE – ALWAYS ASK A & B TOGETHER AND H & I TOGETHER.

- a. **The level of financial support available from the SBRI scheme**
- b. **Lack of finance from other sources**
- c. **Legislative or regulatory requirements**
- d. **Unanticipated difficulties with the technology involved**
- e. **Short time scale of the project**
- f. **Lack of partners**
- g. **Lack of technical expertise in your business**
- h. **Lack of managerial expertise in your business**
- i. **Lack of clarity in the project specification**
- j. **Lack of interaction with <INSERT DEPARTMENT FROM SAMPLE>**

1 – No impact at all 1

2 2

3 3

4 4

5 – Very significant impact 5

(Don't know) 6

(Not applicable) 7

PART C: IMPACT MEASUREMENT PHASE 1 & 2 RECIPIENTS

I would now like to ask some questions about the impact of SBRI on your business.

ASK X2 & X3 & X2/X3

C3 If your business had not received any support from SBRI what would have happened?

READ OUT

Would the project not have taken place at all? 1

Or, would the project have taken place anyway? 2

(Don't know) 3

(Refused) 4

ASK IF CODE 2 AT C3

C3a. Without SBRI support would the project have been...?

READ OUT – MULTICODE ALLOWED

1. Exactly the same as it was with SBRI support
2. Completed more quickly
3. Completed more slowly
4. Started much later
5. Completed but with less of your time or resources invested
6. Completed but it was less ambitious e.g. lower risk or less innovative
7. (Don't know)
8. (Refused)

ASK IF CODE 2 AT C3

C3b Without SBRI support how would the project have been funded?

READ OUT – MULTICODE ALLOWED

1. **Internal funding**
2. **Bank loan or other bank finance**
3. **Business angel or other equity funding**
4. **Another public R&D support scheme**
5. **R&D tax credit**
6. **(Other)**
7. **(Don't know)**
8. **(Refused)**

ASK X2 & X3 & X2/X3

C4 Can you indicate whether your business has experienced any of the following benefits as a direct result of your engagement with SBRI?

READ OUT – RANDOMISE – BUT KEEP 8 AND 9 TOGETHER

1. Increased your awareness of the public sector as a lead customer and its potential contribution to your business
2. Expanded your innovation networks
3. Increased access to specialist skills or talents
4. Increased access to specialist equipment or facilities
5. Gained access to information about new developments or market opportunities
6. Benefitted from knowledge transfer
7. SBRI stimulated other ideas for new innovation projects
8. Improved or modernised your manufacturing facilities
9. Improved your manufacturing capabilities
10. (None of these)
11. (Don't know)
12. (Refused)

ASK X2 & X3 & X2/X3

C4a How has your engagement with SBRI influenced your firms' ability to obtain external finance?

- | | |
|-------------------------|---|
| Made it much easier | 1 |
| Made it a little easier | 2 |
| Made no difference | 3 |
| Made it more difficult | 4 |
| (Not relevant) | 5 |
| (Don't know) | 6 |
| (Refused) | 7 |

ASK X2 & X3 & X2/X3

C5. I'd now like you to think about how the SBRI scheme has changed your business' attitude to innovation? Would you say that...?

READ OUT.

1. **SBRI made us aware of our innovative potential**
2. **We are more likely to engage in innovation in the future because of our participation in the SBRI scheme**
3. **The business' attitude to innovation has become more positive**
4. **Senior management are more receptive and committed to innovation**
5. **(Don't know)**
6. **(Refused)**

ASK X2 & X3 & X2/X3

C5A. And, did your involvement with SBRI lead to any of the following...

READ OUT.- CATI TO ROTATE

INTERVIEWER NOTE: PLEASE DONT SELECT A CODE IF IT'S SOMETHING THE RESPONDENT SAYS WILL HAPPEN – WE ONLY WANT TO CAPTURE WHAT THEY'VE DONE SO FAR.

1. A new line of products / functionalities for your company
2. A modification of existing products/services for your company
3. One or more new patents or patent applications
4. One or more new registered designs or applications
5. Intellectual property protected by trademarks or copyright
6. A first contact with <INSERT DEPARTMENT FROM SAMPLE>
7. (None of these)
8. (Don't know)
9. (Refused)

ASK X2 & X3 & X2/X3

C7 And thinking about the financial impact of SBRI, <IF X3 OR (X2/X3 & CODE 1 AT B10C) and by that I mean the combined effect of both Phase 1 and Phase 2 support,> if you had not received support from *SBRI* would your current turnover be...? READ OUT

- | | |
|---|---|
| Lower (than it is now) i.e. SBRI had a positive effect | 1 |
| About the same | 2 |
| Higher (than it is now) i.e. SBRI had a negative effect | 3 |
| (Don't know) | 4 |
| (Refused) | 5 |

ASK IF CODE 1 AT C7

C7a Approximately how much lower would your current turnover be if you had not received any support from SBRI? PROMPT AS NECESSARY

- Up to 10% lower 1
- 11-20% 2
- 21-40% 3
- 41-60% 4
- 61-80% 5
- 81-100% 6
- (Don't know) 7
- (Refused) 8

ASK IF CODE 3 AT C7

C7b Approximately how much higher would your current turnover be if you had not received any support from SBRI? PROMPT AS NECESSARY

- Up to 10% higher 1
- 11-20% 2
- 21-40% 3
- 41-60% 4
- 61-80% 5
- 81-100% 6
- More than 100% higher 7
- (Don't know) 8
- (Refused) 9

ASK IF CODE 1 OR 3 AT C7

C8 Would you say that this <IF C7=1 positive / IF C7=3 negative> effect of SBRI on your turnover...? READ OUT – SINGLE CODE

- Will only affect your firm this year 1
- Will continue for more years at the same level 2
- Will continue but steadily diminish 3
- Will increase in the future 4
- (Don't know) 5
- (Refused) 6

ASK IF (CODES 2, 3 OR 4 AT C8)

C8a How many years do you think this effect on turnover will last? PROBE AS PER PRECODES

- 1-2 years 1
- 3-4 years 2
- 4-6 years 3
- 6-10 years 4
- More than 10 years 5
- (Don't know) 6
- (Refused) 7

ASK IF (X3 AND CODE 1 AT C7) OR ((X2 OR X2/X3) AND CODE 1 AT B10C AND CODE 1 AT C7)

C9a And still thinking again about the increase to your turnover as a result of your involvement with SBRI, what proportion of this increase would you attribute to the Phase 1 Stage i.e. the establishing proof of concept stage...?

WRITE IN % – CHECK BETWEEN 0-100%

	<i>Percentage of Sales</i>
Phase 1 Stage – Proof of concept stage	%

IF DON'T KNOW AT C9A

C9b If you had to estimate, what proportion of the increase to your turnover would you attribute to the Phase 1 Stage i.e. the establishing proof of concept stage...?

Up to 20% higher 1

21-40% 2

41-60% 3

61-80% 4

81-100% 5

(Don't know) 6

(Refused) 7

IF FIGURE (BETWEEN 0-100%) GIVEN AT C9A

C9b2 So just to confirm, you would estimate <INSERT FROM C9A>% of the increase to your turnover could be attributed to the Phase 1 stage and the remaining <CATI TO COMPUTE 100-C9A>% to phase 2? Is that correct?

Yes 1

No 2 – GO BACK TO C9A

(Don't know) 3

(Refused) 4

ASK IF X3 AND CODE 3 AT C7 OR ((X2 OR X2/X3) AND CODE 1 B10C AND CODE 3 AT C7)

C9c And thinking again about the decrease to your turnover as a result of your involvement with SBRI, what proportion of this decrease would you attribute to the Phase 1 Stage i.e. the establishing proof of concept stage...?

WRITE IN – CHECK BETWEEN 0 - 100%

	<i>Percentage of Sales</i>
Phase 1 Stage – Proof of concept stage	%

IF DONT KNOW AT C9C

C9d If you had to estimate, what proportion of the decrease to your turnover would you attribute to the Phase 1 Stage i.e. the establishing proof of concept stage...?

Up to 20% higher 1

21-40% 2

41-60% 3

61-80% 4

81-100% 5

(Don't know) 6

(Refused) 7

ASK X2 & X3 & X2/X3

C9e And thinking about your expectations for the next three years, do you expect any increase in sales to any of the following as a direct result of this SBRI project....?

1. Increased sales to the <INSERT DEPARTMENT FROM SAMPLE>
2. Increased sales to other public sector organisations in the UK
3. Increased sales to other UK firms or consumers
4. Increased sales outside the UK
5. (No – do not expect any increase in sales to any of the above as a direct result of SBRI)
6. (Don't know)
7. (Refused)

ASK X2 & X3 & X2/X3

C14 As a result of the support or funding you have received from SBRI have you done any of the following...? READ OUT – CODE ALL THAT APPLY

ADD AS NECESSARY **By spin-out company I mean when part of a company/organisation breaks off to form a new separate company**

ADD AS NECESSARY **By spin-out innovation or technology I mean where the innovation/technology you developed has an unintended use in a different field**

Set-up a spin-out company 1

Sold a spin-out company 2

Developed any spin-out innovations or technologies? 3

(None of these) 5

(Don't know) 6

(Refused) 7

SECTION E: WRAP-UP

ASK ALL

E1 That is the end of the interview, thank you very much for taking part. I just need to check a few things, so firstly would you be willing to take part in any future research on this topic conducted on behalf of the Technology Strategy Board?

Yes 1

No 2

(Don't know) 3

(Refused) 4

ASK ALL

E2 We are working with academic researchers who would like to be able to analyse the answers you have provided us with alongside data you may provide to central Government, such as through Companies House. We can assure you that your answers will still remain confidential and will only be presented to the TSB in the form of statistical summaries. Would this be OK?

INTERVIEWER NOTE: READ OUT EXACTLY AS SCRIPTED

AS NECESSARY: This will allow the researchers to 'look up' other data held on your business by central Government, which will in turn allow them to conduct a fuller and more meaningful analysis of this survey data.

Yes 1

No 2

(Don't know) 3

(Refused) 4

ASK ALL

E3 Finally, can I just confirm that your business postcode is...?

CATI TO DISPLAY POSTCODE IF AVAILABLE – AMEND IF MISSING OR
INCORRECT

ASK ALL

E4 And may I take a note of your name?

WRITE IN

STANDARD THANK & CLOSE

Annex 5 Firms Applying During 2013-14

A5.1 Introduction

In this section we provide a profile of the group of firms which applied for SBRI support during the 2013-14 period based on the second of the company surveys. (Details of the second company survey are described in

Annex 4 . The objective of the second survey was to provide a baseline against which future evaluations of SBRI could be undertaken either using follow-up surveys or through data matching. The focus here is therefore on a descriptive account of the characteristics of SBRI applicants and winners during the 2013-14 period and a comparison between 2013-14 applicants and those in the earlier 2011-12 period. As with the analysis in the main text it is important to acknowledge that the analysis reported here excludes SBRI competitions run by the MOD.

Comparison of the company surveys covering the 2011-12 and 2013-14 periods suggest a number of contrasts between the characteristics of applicants between the two periods. The key differences are:

- SBRI applicants in the 2013-14 period tended to be younger than those during the 2011-12 period with a larger proportion less than 2 years old. This is a welcome trend as the programme aims to support newer firms rather than established ones.
- The proportion of SBRI winners during the 2013-14 period which were independent firms (rather than group subsidiaries) was nearly twice as high as during the 2011-12 period. This suggests the programme is increasingly attracting firms of the right kind.
- Little difference was evident in the exporting or sourcing patterns of applicants in the 2011-12 and 2013-14 period.
- Compared with 2011-12, however, the proportion of SBRI winners that engaged in product and service innovation was 16 per cent lower during the 2013-14 period. The profile of product and service innovation – in terms of whether it was new to the market or new to the firm – remained relatively similar between periods.
- SBRI applicants during the 2013-14 period were more R&D intensive than those in the previous period. Compared with the 2011-12 period, the proportion of successful and unsuccessful applicants that allocated more than 50 per cent of current turnover to R&D and innovation activities during the last 2 years increased by 17 per cent for the unsuccessful group and 20 per cent for the successful group of applicants.
- The proportion of non-applicants aware of SBRI was slightly lower (18.6 per cent) during 2013-14 than during the earlier 2011-12 period (22.6 per cent).
- SBRI applicants during the 2013-14 period had a stronger emphasis on developing new technologies than new market opportunities compared with the earlier period.
- Where a Phase 1 application was not awarded in 45.1 per cent of cases (51.7 per cent, 2011-12) the project stopped completely. In 8.4 per cent of cases where Phase 1 funding was not awarded during 2013-14 the project continued anyway, i.e. the project would have continued with or without the funding. This represents an increase on the 4.6 per cent in 2011-12. Where projects were modified there was also a greater tendency in 2013-14 than in 2011-12 to delay and/or decelerate development projects.

A5.2 Applicant Profiles

The age profile of SBRI applicants (divided into winners and non-winners) and the matched control group of non-applicants is given in Table 64. The proportion of very young firms within the total sample i.e. those established 2 years ago, was 10.1 per cent (Table 64). This proportion was higher for applicants (15.3 per cent for unsuccessful applicants and 12.5 per cent for successful applicants), and lower for non-applicant firms (3.4 per cent). Around a third of all applicants were established during the last 4 years

compared to a tenth of non-applicant firms. 64.2 per cent non-applicants were established more than 10 years ago compared to 45.1 per cent of unsuccessful applicants and 35.5 per cent of Phase 1 and Phase 2 winners.

As was the case with Survey A, the applicant groups included a higher proportion of younger firms (2 to 10 years) and a lower proportion of older firms (over 10 years) than the non-applicant control group. Firms applying for SBRI are typically towards the younger end of the age spectrum of firms. It is also notable that – on average – applicants during the 2013-14 period were more likely to be less than 2 years old than in the previous 2011-12 period.

Table 64 Year business was first established (% of firms)

	% Non-applicants (N=234)	SBRI applicants 2013-14		% Total (N=580)
		% Non-winners (N=252)	% Winners (N=94)	
2 years ago	3.4	15.3	12.5	10.1
3 to 4 years ago	6.9	14.2	21.7	12.5
5 to 6 years ago	6.0	8.3	18.8	9.1
7 to 8 years ago	11.5	10.5	8.7	10.6
9 to 10 years ago	8.0	6.6	2.8	6.5
11 to 15 years ago	17.1	11.2	5.7	12.7
16 to 20 years ago	14.5	5.3	3.6	8.7
Over 20 years ago	32.6	28.6	26.2	29.8
Total	100	100	100	100

(Source: Company survey data, observations are weighted.)

The broad sectoral distribution of SBRI applicants over the 2013-14 period was very similar to that over the earlier 2011-12 period: over half of all applicants (59.4 per cent) belonged to the business services sector. The manufacturing (plus) sector had the smallest representation with 8.6 per cent of respondents belonging to this group. The remaining 32.0 per cent of respondents came from the ‘other’ services sector.

Firms were asked if they are an independent business with no subsidiaries, a business with subsidiaries or a subsidiary of another business. A small proportion of the total sample (6.0 per cent) represented ‘other’ business types Table 65. This group includes other answers that were given by respondents such as university departments, charities and NHS foundation trusts. These ‘Other’ business types had a slightly smaller representation among non-applicant firms (3.9 per cent) than within the other groups. Independent businesses with no subsidiaries represented 75.3 per cent of the survey sample. The proportion of businesses with subsidiaries was 8.3 per cent of the total sample and a similar proportion of the individual groups. The successful applicant firms had the highest proportion of firms that were subsidiaries of another business (14.7 per cent), although this proportion was nearly half that in Survey A.

Table 65 Business type

	% Non-applicants (N=236)	SBRI applicants 2013-14		% Total (N=636)
		% Non-winners (N=295)	% Winners (N=105)	
Independent business with no subsidiaries	78.2	75.1	69.4	75.3
A business with subsidiaries	7.7	8.8	8.6	8.3
A subsidiary of another business	10.2	9.1	14.7	10.4
Other	3.9	7.0	7.3	6.0
Total	100	100	100	100

(Source: Company survey data, observations are weighted.)

Across the total sample, 12.6 per cent of firms had 0 to 4 per cent of their employees holding a degree level qualification Table 66. This proportion was highest for non-applicant firms (28.5 per cent) and much lower for both unsuccessful and successful applicants (4.7 and 0.6 per cent respectively). 90.6 per cent of successful SBRI applicants had 50 per cent or more of their employees qualified to at least degree level. The proportion was slightly lower for unsuccessful applicants (83.3 per cent) and much lower for non-applicants (40.6 per cent). 96.4 per cent of Phase 1 and Phase 2 successful applicants had at least 20 per cent of their employees qualified to degree level. This can be compared to 92.6 per cent of unsuccessful applicants and 54.8 per cent of non-applicants. The contrast between the applicant and non-applicant groups in terms of graduate level qualifications observed during the 2013-14 period was also evident during the 2011-12 period.

Table 66 Percentage of employees with a degree level qualification or higher

	% Non-applicants (N=218)	SBRI applicants 2013-14		% Total (N=598)
		% Non-winners (N=278)	% Winners (N=102)	
0 to 4 per cent	28.5	4.7	0.6	12.6
5 to 9 per cent	8.4	1.0	0.5	3.6
10 to 19 per cent	8.3	1.7	2.5	4.3
20-49 per cent	14.2	9.3	5.8	10.5
50 per cent or more	40.6	83.3	90.6	69.0
Total	100	100	100	100

(Source: Company survey data, observations are weighted.)

A5.3 International Trade and Innovation

We asked firms if they sold products and services overseas. Across the total survey sample, 40.8 per cent of firms said that they exported during 2013-14. The proportion of Phase 1 and Phase 2 successful applicants exporting was slightly less (38.6 per cent) and that for unsuccessful applicants was more (53.7 per cent). Fewer non-applicants engaged in exporting with 28.9 per cent saying that they sold products and services abroad. Compared with 2011-12, the proportion of firms exporting during 2013-14 was slightly lower for applicants and more than 8 per cent lower for non-applicants.

73.2 per cent of the total sample sourced 80 per cent or more of their goods and services inputs from within the UK (Table 67). The proportions are similar across groups; although that for unsuccessful applicants is slightly lower (68.9 per cent). The proportion of the total sample sourcing no goods and service inputs from within the UK is 3.8 per cent. This proportion is similar across individual groups. 88.6 per cent of all respondents sourced 40 per cent or more of their goods and service inputs from within the UK. These proportions were broadly similar in the 2011-12 period.

Table 67 Proportion of goods and service inputs that are sourced from within the UK

	% Non-applicants (N=224)	SBRI applicants 2013-14		% Total (N=582)
		% Non-winners (N=262)	% Winners (N=96)	
0 per cent	3.7	4.0	3.6	3.8
1 to 9 per cent	0.7	1.3	1.0	1.0
10 to 19 per cent	3.5	2.5	2.0	2.8
20 to 39 per cent	3.7	4.9	1.5	3.8
40 to 59 per cent	5.9	9.3	11.7	8.5
60 to 79 per cent	4.6	9.1	6.3	6.9
80 per cent or more	77.9	68.9	73.9	73.2
Total	100	100	100	100

(Source: Company survey data, observations are weighted.)

In terms of innovation during the 2013-14 period, 65.3 per cent of respondents introduced a new or significantly improved product or service in the last 2 years. The proportion was higher for applicants, with that for Phase 1 and Phase 2 winners being higher than that for unsuccessful firms (78.6 per cent compared to 71.3 per cent). The proportion was lowest in the non-applicant group (51.7 per cent). Compared with Survey A, the proportion of Phase 1 and Phase 2 winners that engaged in product and service innovation was 16 per cent lower.

The proportion of respondents that introduced products or services to the market for the first time was 63.3 per cent (Table 68). It was highest for Phase 1 and Phase 2 winners (72.5 per cent) and lowest for non-applicant firms (47.3 per cent). Firms that introduced products and services that were new to the business but had previously been sold elsewhere were 21.8 per cent of the total survey sample. The proportion was slightly lower for successful and unsuccessful applicants and higher for non-applicants (30.7 per cent).

Table 68 Further details: new or significantly improved products / services introduced (last 2 years)

	% Non-applicants (N=119)	SBRI applicants 2013-14		% Total (N=408)
		% Non-winners (N=208)	% Winners (N=81)	
Introduced to the market for the first time	47.3	68.8	72.5	63.3
Introduced to the business for the first time but previously sold elsewhere	30.7	18.1	18.0	21.8
Previously sold by the business but have been technically improved	58.2	38.9	47.2	46.2
Previously sold by the business but have been aesthetically improved	27.3	21.4	27.6	24.3

(Source: Company survey data, observations are weighted.)

Approximately half of the total sample introduced a new or significantly improved process during the last 2 years. Two thirds of successful applicants engaged in process innovation as did 59.0 per cent of unsuccessful applicants. The non-applicant group had the lowest proportion of firms introducing a new or significantly improved process (37.0 per cent). These proportions were very similar in 2011-12 and 2012-13.

Around half of non-applicants (50.1 per cent) allocated less than 2 per cent of overall turnover to R&D and innovation activities during the last 2 years (Table 69). The proportion of successful and unsuccessful applicants allocating the same amount was 4.2 and 8.4 per cent respectively. 56.3 per cent of successful applicants allocated more than 50 per cent of overall turnover to R&D and innovation activities, whereas only 3.2 per cent of the non-applicant group allocated the same proportion. Compared with the 2011-12 period, the proportion of successful and unsuccessful applicants that allocated more than 50 per cent of current turnover to R&D and innovation activities during the last 2 years increased by 17 per cent for the unsuccessful group and 20 per cent for the successful group of applicants. The non-applicant proportion fell slightly (5.2 per cent compared to 3.2 per cent).

Table 69 Proportion of overall turnover allocated to R&D and innovation (last 2 years)

	% Non-applicants (N=203)	SBRI applicants 2013-14		% Total (N=542)
		% Non-winners (N=246)	% Winners (N=93)	
Less than 2 per cent	50.1	8.4	4.2	23.3
3 to 5 per cent	13.3	9.0	0.5	9.2
6 to 10 per cent	13.8	12.4	8.7	12.3
11 to 20 per cent	8.2	14.2	5.0	10.3
21 to 50 per cent	11.4	15.7	25.3	15.7
More than 50 per cent	3.2	40.3	56.3	29.2
Total	100	100	100	100

(Source: Company survey data, observations are weighted.)

The proportion of innovating firms that cooperated on any innovation activity was high across all groups. Proportions were similar for the successful and unsuccessful applicant groups (98.7 and 98.2 per cent respectively) and smaller for the non-applicant firms (86.9 per cent). These proportions remained very similar between the 2011-12 and 2013-14 periods.

A small proportion of unsuccessful applicants (3.5 per cent) were unaware of any of the support schemes for R&D and innovation (excluding SBRI) (Table 70). Within the non-applicant group, the proportion was much larger (43.6 per cent). The proportion of successful applicants aware of each scheme was greater than that of the unsuccessful applicants. Awareness of individual support schemes in the non-applicant group was much lower than that in the unsuccessful group. 18.6 per cent of firms in the non-applicant group were aware of the SBRI programme. Compared with the 2011-12 period, the total sample proportions indicating awareness of the schemes, were higher (for all schemes), and the proportion of the total sample that was unaware of any of the schemes was lower. Specifically, the proportion of non-applicants aware of SBRI was slightly lower (18.6 per cent compared to 22.6 per cent).

Table 70 Awareness of government support schemes for R&D and innovation

	% Non-applicants (N=203)	SBRI applicants 2013-14		% Total (N=542)
		% Non-winners (N=246)	% Winners (N=93)	
Collaborative R&D Grants	11.2	48.8	56.0	36.2
Catapult Centres	4.9	57.7	71.6	40.7
Innovation Vouchers	13.8	57.8	68.8	43.5
R&D Tax Credits	36.8	67.4	85.7	59.2
EU Framework programmes	17.5	64.3	70.8	48.2
Horizon 2020	12.5	71.2	83.6	51.8
SBRI (Non-applicants only)	18.6	-	-	-
Not aware of any of the above	43.6	3.5	0.6	17.7

(Source: Company survey data, observations are weighted.)

A5.4 Applying for SBRI

In this section we compare the profiles of applicants and the early stages of the customer journeys of applicants to the SBRI programme during 2011-2012 and 2013-14. During the 2013-14 period 51.5 per cent of the applicants to the SBRI programme had previously been suppliers to the public sector, a lower proportion (60.2 per cent) than during the earlier 2011 to 2012 period. Firms' information sources about SBRI appear to have changed relatively little between the 2011-12 and 2013-14 period (Table 71). In both periods brokerage or referral from a third party was the main source of information about SBRI followed by the Innovate UK website.

Table 71 How do firms hear about SBRI?

Source of information about SBRI	% SBRI Applicants	
	2011-12 (N=222)	2013-14 (N=406)
Brokerage or Referral from a third party	27.6	29.2
The Technology Strategy Board website	14.0	16.8
Leaflets (including email) about the SBRI scheme	10.4	11.3
Another business	9.3	1.3
Being contacted directly by the Technology Strategy Board	6.7	8.7
Higher Education Institution (e.g. university)	3.1	2.9
An event or workshop which was held by, or run in conjunction with the Technology Strategy Board or other government department	3.0	3.1
Enterprise Agency	1.8	0.5
Through a Knowledge Transfer Network or other technology network	1.4	3.4
Other	22.8	22.5
Total	100.0	100.0

(Source: Company survey data, observations are weighted.)

As part of the surveys SBRI applicants were also asked to identify the main reason why they sought support from the scheme. Here, we see something of a change in profile with applicants during the 2013-14 period having a stronger emphasis on developing new technologies rather than new market opportunities (Table 72).

Table 72 Main reason for seeking SBRI support: winners and non-winners

	% SBRI Applicants	
	2011-12 (N=187)	2013-14 (N=368)
To help your business grow	19.3	18.2
To grow your sales to the public sector	8.0	5.9
To get help in developing a new technology	45.5	60.6
To get access to specific technical expertise	5.3	4.1
To get access to new market opportunities	21.9	11.1
Total	100.0	100.0

(Source: Company survey data, observations are weighted.)

We also asked firms about their views of the pre-application information provided about SBRI and the application process during 2013-14. Responses here were very similar to those for the earlier 2011-12 period with a general sense that the application process and information provided were helpful and that the application process helped formalise the technical objectives of the project and seemed appropriate. Around 30.4 per cent of firms of firms (40.0 per cent, 2011-12) felt that the application process was overly complex, although this figure fell to only 15.6 per cent among winners.

Table 73 Views of the application process: winners and non-winners, % agreeing, 2013-14

	% Non-winners (N=278)	% Winners (N=101)	% Total (379)
The pre-application consultation and information process was helpful	82.0	96.0	85.9
The application process helped me to formalise the technical objectives of the project	70.1	84.3	74.0
The application process seemed appropriate for the competition	77.4	96.8	82.7
The application process was overly complex and time consuming	35.8	15.6	30.4
Total	100.0	100.0	100.0

(Source: Company survey data, observations are weighted.)

Where a Phase 1 application was not awarded funding what happened to the project during 2013-14? This is important as it provides an indication of the additionality of Phase 1 support. In 45.1 per cent of cases (51.7 per cent, 2011-12) the project stopped completely when funding was not awarded (Table 74). In 8.4 per cent of cases where Phase 1 funding was not awarded during 2013-14 the project continued anyway, i.e. the project would have continued with or without the funding. This represents an increase on the 4.6 per cent in 2011-12. Where projects were modified there was also a greater tendency in 2013-14 than in 2011-12 to delay and/or decelerate development projects.

Table 74 Outcomes where Phase 1 project applications were rejected

	2011-12	2013-14
	%Non-winners (N=174)	%Non-winners (N=299)
A. Project outcomes		
The project stopped completely	51.2	45.1
The project continued in exactly the same way	4.6	8.4
The project continued but was modified	39.1	44.2
(Don't know/Refused)	5.2	2.3
Total	100.0	100.0
B. Project changes where continued but was modified		
Proceed, but with a delayed start	8.8	40.5
Proceed, but more slowly than it would have done with SBRI support	48.5	69.7
Proceed, but with less of your time or resources invested	57.4	69.1

(Notes and Sources: Company survey data, non-winners only. In section B more than one option was allowed so figures total to more than 100 per cent.)

Annex 6 Qualitative feedback on MOD Competitions

A6.1 Introduction

MOD adopted an opt-in approach to the SBRI evaluation. Firms that had submitted a proposal for one of the Centre for Defence Enterprise (CDE) themed competitions were emailed and asked if they wanted to take part in the research. Only those responding to this email request were included in the sample data provided to the research team. A total of 14 firms responded across both the Evaluation and Baseline survey periods, around 2 per cent of the successful applicants (616) to the MOD SBRI Phase 1 competitions over the period we reviewed. Only 7 of the 14 firms provided a telephone contact number and no details of the competition, the application or the outcome of the firm's proposal were provided.

Because of the low number of potential respondents no quantitative analysis of these cases was undertaken. Instead we conducted in depth qualitative interviews wherever possible. It proved possible to conduct 6 executive depth interviews within the timescale of the survey. Limited weight should be attached to any results here given the small number of interviews and the self-selecting nature of the sample.

In fact 3 out of the 6 had been unsuccessful at the application stage (for more than one competition/proposal), 1 out of the 6 were successful in Phase 1 but were unsuccessful at Phase 2, 1 out of the 6 had both successful and unsuccessful applications, and 1 out of the 6 had been successful in one or more of their proposals. Respondents were typically from micro/small, consultancy firms focussed on R&D and innovation activity with skilled staff. Some respondents had previously done defence work (including providing services to larger firms that were contracted by MOD) but none had supplied MOD directly.

A6.2 Coming to SBRI

Firms' reasons for seeking finance/applying were often the lack of internal funding and the potential for developing innovative ideas. Not all firms were 'seeking' finance, however. Some have existing technology/capabilities they have developed and are seeking opportunities to exploit or commercialise their technologies but may not necessarily have had the funds to invest in further development. One firm commented: 'I don't think it was the money, I think it was that they identified a problem that we could address'. One respondent mentioned that for them they thought it would be a first step to becoming a supplier to the MOD.

Firms noted the change in the application process from a 'white paper' type proposal submission to a standardised online submission. Some perceived the current online form to be restrictive, overly complex and not useful for the project at all. Typical comments were:

"They use unfamiliar terminology that needs looking up. The instruction manual is about 60 pages long".

"The application process is more intensive than for other funding sources in the commercial world".

The issue of the language used in the application was also felt to be alien to those without prior knowledge. One firm commented: 'In the pro-forma some of the language is very militaristic in its thinking which is totally alien to anyone outside of a military background. It acts as an effective barrier of entry to anyone that isn't in that club'. And another: "The submission process had lots of unexplained military jargon in it – even though we've got lots of military background we didn't understand it".

Balancing these comments, some firms felt that the process of applying helpfully guided you through questions that are well worth considering and help to clarify the requirements of the competition.

The unsuccessful firms that we have spoken to criticised the feedback on proposals. Firms felt that feedback on unsuccessful proposals is received online with little or no scope to discuss the decision further, and would like to be able to discuss both the proposal and the feedback in person. Unsuccessful firms were in some instances a little irate and criticised the assessment board regarding issues and feedback as vague, funding limited and decisions being based on prior relationships rather than scientific quality. The lack of 'rational' feedback has led to some organisations deciding not to apply for future funding.

A6.3 Project Outcomes

Amongst the 3 successful firms, one respondent felt that the project had reached all of its objectives. Barriers to project development mentioned by successful firms were limited, although issues mentioned include: when input required from MOD this can sometimes be 'clunky' and typically takes considerable time; there can be a distinct lack of contact from monitoring officers such that successful firms feel somewhat abandoned. Impacts reported included: expanding networks, increased opportunities for firm, stimulating ideas, increasing capability. Some firms also felt that their credibility increased considerably as a result of receiving MOD funding

Some respondents felt that without the CDE funding the project simply would not have gone ahead – the competition was a prompt to explore a new market they hadn't previously considered or thought about targeting. One firm said that having an actual contract for a project is beneficial to them from an accounts perspective as opposed to being granted funding

Annex 7 The Terms of Reference for the Study

Theme 1 - The Target

1. Set out a baseline of activity including, but not limited to, departmental engagement, number of competitions, number of firms engaged, and applications received, and project outcomes. The report should establish the baseline as was before the Spending Review announcement and assess any changes in these measures since.
2. Establish what types of firms currently use SBRI. This should consider characteristics including age, size, location and industry. Differences between firm types across lead-departments should be considered, as well as any differences in outcomes.
3. Set out a baseline around current behaviour and attitudes amongst public sector bodies, including those without a target, and establish whether the target has affected these.

Theme 2 – The Process

1. What changes could be implemented to improve SBRI in the short-term?
2. What is the ability of departments to identify their strategic challenges and internal processes which enable the identification of challenges which can use the SBRI mechanism?
3. Is there any difference between competitions run by different parties? What factors affect these differences?
4. How effectively does Innovate UK engage with government departments on SBRI?
5. How effectively does SBRI engage with firms?
6. Does SBRI meet the requirements of the firms it seeks to support?
7. Do the two stages of SBRI awards lead to sufficient support through the technology development process?
8. Where the commissioning department is the lead customer for the output of a project, is there a joined up process to connect the output of the SBRI work to adoption?
9. Is there a difference in the results between “operational” and “policy supporting” SBRI competitions?
10. Are firms and government departments satisfied with their experience of SBRI?

Theme 3 – The Impact

1. The extent to which winning an SBRI contract assisted business participants in bringing to market new products or services, or in using new processes which contribute to improved business performance.
2. The extent to which the projects have led to other additional beneficial changes in participating businesses, including;
 - a. Leveraging additional investment.
 - b. Leading to further engagement with the sponsoring body or other government support.
 - c. Carrying out further R&D projects, either with or without government support.
 - d. Increased employment, sales, profitability or productivity.
 - e. Increase understanding or skills relevant to innovation or government procurement.
 - f. Accelerating the commercialisation of innovative products and services
 - g. A widening of operations into other markets as a result of SBRI engagement.
3. The extent to which running a competition through SBRI leads to beneficial impacts for government departments, including;
 - a. Improving departments’ understanding of their challenges and where industry could help provide solutions.
 - b. Help departments understand the role of innovation and where it can be applied to their benefit.
 - c. Providing effective, innovative solutions to policy challenges.
 - d. Increasing the quality of public services.
 - e. Decreasing the delivery cost of public services.
 - f. Increasing engagement with innovative SMEs.

- g. Increasing understanding of the role of innovation in solving challenges and how this could benefit the department
 - h. Increased understanding of the departments' challenges and where industry could help resolve them?
 - i. Increased departments' ability to access new suppliers?
- 4. The extent to which SBRI leads to spill over impacts, to suppliers, customers, competitors, or any other groups?

The Base-lining – Data Collection and Management Issues

- 5. What data is currently collected by Innovate UK?
- 6. What data is available in the public domain?
- 7. What data collection needs to be implemented?

Annex 8 Technology Readiness Levels

Box 2 TRL Levels as Defined by EU Commission

Commission Decision C(2014)4995 G. Technology readiness levels (TRL) Where a topic description refers to a TRL, the following definitions apply, unless otherwise specified:

TRL 1 – basic principles observed

TRL 2 – technology concept formulated

TRL 3 – experimental proof of concept

TRL 4 – technology validated in lab

TRL 5 – technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)

TRL 6 – technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)

TRL 7 – system prototype demonstration in operational environment

TRL 8 – system complete and qualified

TRL 9 – actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

(Source: Horizon 2020 Workplan)

Annex 9 References

1. P3ITS Consortium. Pre-commercial Public Procurement for ITS Innovation and Deployment, WP2 Analysis of public pre-commercial procurement models and mechanisms, Version 1.8 May 2011. 2011.
2. HM Treasury. Spending Round 2013. 2013.
3. OECD. Demand Side Innovation Policies: OECD Publishing; 2011.
4. Bound K, Puttick R. Buying Power? Is the Small Business Research Initiative for procuring R&D driving innovation in the UK? . NESTA, 2010.
5. European Commission. Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions COM(2007) 799 final Pre-commercial Procurement: Driving innovation to ensure sustainable high quality public services in Europe, {SEC(2007) 1668},. Brussels2007.
6. Rigby J. Review of Pre - commercial Procurement Approaches and Effects on Innovation Compendium of Evidence on the Effectiveness of Innovation Policy Intervention. London: National Endowment for Science Technology and the Arts, 2013.
7. Commission E. Proposal for a Directive Of The European Parliament And Of The Council on public procurement (Text with EEA relevance) {SEC(2011) 1585 final} {SEC(2011) 1586 final} 2011 896.
8. Semple A. Public Procurement of Innovation Guidance for Public Authorities. Procurement of Innovation Platform ICLEI – Local Governments for Sustainability (Project coordinator) Wolfgang Teubner (responsible), 2014.
9. Bos L. Guidance about the use of the innovation partnership procedure versus two separate procedures for purchasing R&D and final end-products. In: Connect D, editor. 2014.
10. Office C. Government Response to the Consultation on UK Transposition of new EU Procurement Directives, Public Contracts Regulations 2015. 2015.
11. Connell D. Creating Markets For Things That Don't Exist The Truth About UK Government R&D and How the Success of SBRI Points the Way to a New Innovation Policy to Help Bridge the Valley of Death and Rebalance the UK Economy. Cambridge: Centre for Business Research, University of Cambridge, Top Floor, Judge Business School, Trumpington Street, Cambridge CB2 1AG, 2014.
12. Gordon S. Public sector urged to back innovators as funding falls. The Financial Times. 2014 24 November.
13. Amann M, Essig M. Public procurement of innovation: empirical evidence from EU public authorities on barriers for the promotion of innovation. Innovation: The European Journal of Social Science Research. 2015:1-11.
14. Technology readiness levels (TRL), HORIZON 2020 – WORK PROGRAMME 2014-2015 General Annexes, Extract from Part 19, (2014).
15. European Space Agency. Technology Readiness Levels Handbook For Space Applications. 2008.
16. Portnoy M. Personal communication on the design of the US SBRI Program. In: Manchester SRT-, editor. 2015.
17. Bound K, & Puttick, R. Buying Power? Is the Small Business Research Initiative for procuring R&D driving innovation in the UK? . NESTA, 2010.
18. Qian H, Haynes K. Beyond innovation: the Small Business Innovation Research program as entrepreneurship policy. J Technol Transf. 2014 2014/08/01;39(4):524-43. English.
19. TSB. SBRI Top Level Process - Release v 1.5 06.02.11. 2013.
20. UK I. SBRI Top Level Process. 2011.
21. IPO. Patent your invention 2014 [cited 2014 22 November 2014]. Available from: <https://www.gov.uk/patent-your-invention/overview>.
22. Government Accountability Office. SMALL BUSINESS RESEARCH PROGRAMS - Actions Needed to Improve Compliance with Spending and Reporting Requirements. (GAO), 2013.
23. BIS. First Findings from the UK Innovation Survey 2013, Table 1 Available at: <https://www.gov.uk/government/statistics/uk-innovation-survey-2013-statistical-annex>. 2013.

24. Science and Technology Committee. Third Special Report: Bridging the valley of death: improving the commercialisation of research: Government Response to the Committee's Eighth Report of Session 2012-13. London: HMSO; 2013.
25. Committee for Capitalizing on Science Technology and Innovation. An Asssment of the SBIR Program. Washington D.C.: The National Academies Press; 2008.
26. Abadie A, Imbens G. Simple and bias-corrected matching estimators. Technical report. University of California, Berkeley: Department of Economics, University of California, Berkeley, 2002.
27. Abadie A, and G. W. Imbens. . Large sample properties of matching estimators for average treatment effects. *Econometrica*. 2006;74:235–67.
28. Abadie A, Imbens GW. Bias-corrected matching estimators for average treatment effects. *Journal of Business and Economic Statistics*. 2011;29:1–11.
29. Abadie A, Drukker D, Leber Herr J, Imbens GW. Implementing matching estimators for average treatment effects in Stata *The Stata Journal*. 2004 4(3):290-311.
30. Department for Business Innovation and Skills. Research to improve the assessment of additionality. 2009 Contract No.: 1 October 2009.
31. Department for Business Innovation and Skills. Research to improve the assessment of additionality. 2009 Contract No.: 1 October 2009.
32. Meuleman M, De Maeseire W. . Do R&D Subsidies Affect Smes' Access to External Financing? . *Research Policy* 2012;41(3):580-91.
33. Office of Health Economics. Evaluation of the SBRI Healthcare Programme (2008-2013) - Draft for comments. London: Office of Health Economics, UK (Authors: Michele Pistollato, Jorge Mestre-Ferrandiz, Fraser Lewis and Jon Sussex), 2014.
34. OHE Consulting. Evaluation of the SBRI Healthcare Programme (2008-2013) - draft for comments. 2014.
35. Kline SJ, Rosenberg N. An overview of innovation. In: Landau R, Rosenberg N, editors. *The Positive Sum Strategy: Harnessing Technology for Economic Growth*. Washington, D.C: National Academy Press, ; 1986. p. 275–305.
36. Imbens GW, Wooldridge JM. Recent Developments in the Econometrics of Program Evaluation. *Journal of Economic Literature*. 2009;47(1):5-86.
37. Gök A, Edler J. The use of behavioural additionality evaluation in innovation policy making *Research Evaluation* 2012;21(4):306-18.

Annex 10 The Study Team

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Annex 11 Department Based Analysis Breakdown Across the Three Periods

Period 1: October 2008 – August 2010

Table 75 Number and phase of competitions run by various departments October 2008 – August 2010

Department	P1 only	P2 only	Two-phase	Total
MOD	13	0	3	16
NHS	4	0	5	9
HO	1	1	1	3
DH	0	0	2	2
DECC	0	0	1	1
DEFRA	0	0	1	1
DfT	0	1	0	1
Innovate UK	0	0	1	1
Other	1	0	0	1
Total	<u>19</u>	<u>2</u>	<u>14</u>	<u>35</u>

(Source: Innovate UK Management Data)

Note:

This table includes all competitions that were launched during this period, the number of which is 35. Departments are sorted according to size of use.

Table 76 Numbers of applications, competitions, contracts and contract value (Breakdown according to departments) October 2008 – August 2010

Department	Number of Applications (P1)	Number of applications (P2)	Number of Contracts awarded (P1)	Number of Contracts awarded (P2)	Value of Contracts P1 (£k)	Value of Contracts P2 (£k)	Total value of contracts (£k)
Innovate UK	345	192	192	87	£3,446	£12,439	£15,885
MOD	698	28	137	4	£7,869	£1,102	£8,971
DH	53	13	13	6	£1,228	£3,885	£5,113
NHS	283	23	28	9	£1,884	£2,393	£4,277
DECC	120	21	21	9	£331	£1,500	£1,831
HO	84	56	9	4	£1,042	£576	£1,618
DEFRA	42	6	6	2	£209	£990	£1,199
DfT	NA	19	NA	3	NA	£300	£300
Other	22	0	2	0	£230	£0	£230
Total	<u>1647</u>	<u>358</u>	<u>408</u>	<u>124</u>	<u>£16,239</u>	<u>£23,185</u>	<u>£39,424</u>

(Source: Innovate UK Management Data)

Note:

This table includes all competitions that were launched during this period, the number of which is 35. Departments are sorted according to value of contracts.

Table 77 Innovate UK co-fund (Breakdown according to departments) October 2008 – August 2010

Department	Innovate UK contribution P1 (£k)	Innovate UK contribution P2 (£k)	Total Innovate UK contribution (£k)	Innovate UK co-fund P1 (%)	Innovate UK co-fund P2 (%)	Overall Innovate UK co-fund (%)
NHS	£684	£951	£1,636	36%	40%	38%
DEC C	£166	£750	£916	50%	50%	50%
MOD	£432	£220	£652	5%	20%	7%
DEF RA	£105	£495	£600	50%	50%	50%
HO	£100	£87	£187	10%	15%	12%
DfT	NA	£100	£100	NA	33%	33%
DH	£0	£0	£0	0%	0%	0%
Other	£0	NA	£0	0%	NA	0%
Total	£1,486	£2,604	£4,090	12%	24%	17%

(Source: Innovate UK Management Data)

Note:

This table includes all non-Innovate UK competitions that were launched during this period, the number of which is 34. Departments are sorted according to size of co-funding.

Period 2: September 2010 – September 2012

Table 78 Number and phase of competitions run by various departments September 2010 – September 2012

Department	P1 only	P2 only	Two-phase	Total
MOD	20	0	10	30
NC3Rs	0	6	4	10
DEFRA	4	0	3	7
Other	1	2	2	5
Innovate UK	0	1	3	4
BIS	0	0	3	3
DECC	1	0	2	3
DH	0	0	3	3
DAs	0	2	0	2
NHS	0	0	2	2
HO	0	0	1	1
Total	26	11	33	70

(Source: Innovate UK Management Data)

Note:

This table includes all competitions that were launched during this period, the number of which is 70. Departments are sorted according to size of use.

Table 79 Numbers of applications, competitions, contracts and contract value (Breakdown according to departments) September 2010 – September 2012

Department	Number of Applications (P1)	Number of applications (P2)	Number of Contracts awarded (P1)	Number of Contracts awarded (P2)	Value of Contracts P1 (£k)	Value of Contracts P2 (£k)	Total value of contracts (£k)
Innovate UK	105	139	29	72	£1,652	£26,474	£28,126
MOD	1537	115	309	30	£18,942	£3,786	£22,728
Other	60	145	18	19	£1,806	£6,255	£8,061
NC3Rs	24	52	10	8	£1,176	£5,496	£6,672
DECC	107	28	32	13	£741	£4,984	£5,725
BIS	126	33	33	9	£1,669	£2,596	£4,265
DH	152	13	13	8	£1,123	£2,625	£3,748
NHS	100	14	14	6	£1,096	£1,754	£2,850
DEFRA	121	23	40	11	£1,154	£990	£2,144
HO	50	6	6	1	£609	£554	£1,163
DAs	NA	123	NA	9	NA	£207	£207
Total	2382	691	504	186	£29,966	£55,722	£85,689

(Source: Innovate UK Management Data)

Note:

This table includes all competitions that were launched during this period, the number of which is 70. Departments are sorted according to value of contracts.

Table 80 Innovate UK co-fund (Breakdown according to departments) September 2010 – September 2012

Department	Innovate UK contribution P1 (£k)	Innovate UK contribution P2 (£k)	Total Innovate UK contribution (£k)	Innovate UK co-fund P1 (%)	Innovate UK co-fund P2 (%)	Overall Innovate UK co-fund (%)
MOD	£4,735	£757	£5,493	25%	20%	24%
Other	£500	£1,900	£2,400	28%	30%	30%
NC3Rs	£513	£1,493	£2,006	44%	27%	30%
BIS	£634	£1,347	£1,981	38%	52%	46%
NHS	£548	£877	£1,425	50%	50%	50%
HO	£304	£277	£581	50%	50%	50%
DEFRA	£212	£122	£334	18%	12%	16%
DAs	NA	£50	£50	NA	24%	24%
DECC	£30	£0	£30	4%	0%	1%
DH	£0	£0	£0	0%	0%	0%
Total	£7,477	£6,824	£14,301	26%	23%	25%

(Source: Innovate UK Management Data)

Note:

This table includes all non-Innovate UK competitions that were launched during this period, the number of which is 66. Departments are sorted according to size of co-funding.

Period 3: October 2012 – July 2014

Table 81 Number and phase of competitions run by various departments October 2012 – July 2014

Department	P1 only	P2 only	Two-phase	Total
BIS	0	0	2	2
DAs	1	0	6	7
DECC	0	0	3	3
DEFRA	0	0	3	3
DfT	0	0	3	3
DH	0	0	4	4
HO	0	0	8	8
Innovate UK	0	1	9	10
MOD	20	1	11	32
NC3Rs	0	0	5	5
NHS	0	0	12	12
Other	1	0	0	1
Total	22	2	66	90

(Source: Innovate UK Management Data)

Note:

This table includes all competitions that were launched during this period, the number of which is 90.

Departments are sorted according to size of use.

Table 82 Numbers of applications, competitions, contracts and contract value (Breakdown according to departments) October 2012 – July 2014

Department	Number of Applications (P1)	Number of applications (P2)	Number of Contracts awarded (P1)	Number of Contracts awarded (P2)	Value of Contracts P1 (£k)	Value of Contracts P2 (£k)	Total value of contracts (£k)
NHS	462	35	61	20	£5,884	£18,515	£24,399
DECC	105	33	35	12	£1,143	£23,190	£24,333
Innovate UK	644	40	95	10	£8,964	£5,473	£14,437
MOD	1060	9	193	5	£11,824	£1,235	£13,059
DH	248	8	31	5	£3,725	£2,969	£6,694
NC3Rs	31	14	17	5	£1,562	£4,895	£6,457
HO	134	14	37	7	£2,274	£2,766	£5,040
DAs	193	21	43	10	£1,802	£1,647	£3,449
DfT	192	0	29	0	£1,351	£0	£1,351
BIS	46	7	8	5	£407	£624	£1,031
DEFRA	25	4	13	1	£549	£197	£745
Other	19	NA	2	NA	£200	NA	£200
Total	3159	185	564	80	£39,684	£61,511	£101,195

(Source: Innovate UK Management Data)

Note:

This table includes all competitions that were launched during this period, the number of which is 90.

Departments are sorted according to value of contracts.

Table 83 Innovate UK co-fund (Breakdown according to departments) October 2012 – July 2014

Department	Innovate UK contribution P1 (£k)	Innovate UK contribution P2 (£k)	Total Innovate UK contribution (£k)	Innovate UK co-fund P1 (%)	Innovate UK co-fund P2 (%)	Overall Innovate UK co-fund (%)
MOD	£2,831	£518	£3,349	24%	42%	26%
NC3Rs	£484	£1,517	£2,002	31%	31%	31%
DAs	£339	£779	£1,117	19%	47%	32%
BIS	£203	£312	£516	50%	50%	50%
DH	£500	£0	£500	13%	0%	7%
HO	£500	£0	£500	22%	0%	10%
DECC	£0	£0	£0	0%	0%	0%
DEFRA	£0	£0	£0	0%	0%	0%
DFT	£0	£0	£0	0%	0%	0%
NHS	£0	£0	£0	0%	0%	0%
Other	£0	NA	£0	0%	NA	0%
Total	£4,857	£3,126	£7,984	16%	6%	9%

(Source: Innovate UK Management Data)

Note:

This table includes all non-Innovate UK competitions that were launched during this period, the number of which is 80.

Departments are sorted according to size of co-funding.

Annex 12 Table of Tables

Table 1 The UK SBRI and other Programme Types.....	24
Table 2 SBRI General Timeline.....	28
Table 3 Overview of competitions launched by user departments.....	33
Table 4 Count and phase of competitions run by various departments October 2008 – July 2014	34
Table 5 Phase 1 analysis – breakdown according to departments (October 2008 – July 2014).....	35
Table 6 Phase 2 analysis – breakdown according to departments (October 2008 – July 2014).....	36
Table 7 Phase 1 only Competitions (by Department) October 2008 – July 2014.....	37
Table 8 P2 only Competitions (by Department) October 2008 – July 2014.....	38
Table 9 Two-phase competitions’ contracts awarded (by Dept.) October 2008 – July 2014 part 1	39
Table 10 Two-phase competitions’ contracts awarded (by Dept.) October 2008 – July 2014 – part 2.....	40
Table 11 Innovate UK co-fund (by Department) October 2008 – July 2014.....	41
Table 12 Count of operational and Policy Competitions (by Department)	44
Table 13 Phases of operational versus policy competitions October 2008 – July 2014.....	45
Table 14 Operational and policy competitions: applications and contracts October 2008 – July 2014	46
Table 15 Count of applications, contracts and contract value (by Firm Size) October 2008 – July 2014...47	47
Table 16 Count of applications, contracts and contract value (by Region)	48
Table 17 Size and sectoral analysis of SBRI Applicants	53
Table 18 Time since the business was first established.....	54
Table 19 Business type.....	55
Table 20 Percentage of employees with a degree level qualification or higher	55
Table 21 Proportion of goods and service inputs that are sourced from within the UK	56
Table 22 Awareness of government support schemes for R&D and innovation	57
Table 23 How do firms hear about SBRI?.....	58
Table 24 Main reason for seeking SBRI support: winners and non-winners	59
Table 25 Views of the application process: winners and non-winners, % agreeing.....	59
Table 26 Outcomes where Phase 1 project applications were rejected.....	60
Table 27 Achievement of Phase 1 objectives: Phase 1 and Phase 2 winners	60
Table 28 Outcomes where Phase 2 project applications were rejected.....	61
Table 29 Achievement of Phase 1 objectives: Phase 1 and Phase 2 winners	62
Table 30 Departmental SBRI Use, Gross Procurement and SBRI Share.....	65
Table 31 Information Management in the SBRI Process.....	72
Table 32 Average treatment effects for innovation activity: 2013 and 2014.....	85
Table 33 Average treatment effects for business growth: 2013 and 2014	85
Table 34 Average treatment effects on the treated for business growth: 2013 and 2014	86
Table 35 Average treatment effects for future innovation activity: 2013 and 2014	86
Table 36 Estimating average turnover effects of SBRI by 2014	87
Table 37 Estimated gross turnover effects of SBRI support.....	88
Table 38 Estimated discounted turnover effects of SBRI support.....	88
Table 39 Estimating GVA to turnover ratio for SBRI applicants	89
Table 40 Estimated discounted gross value added of SBRI support.....	90
Table 41 Discounted GVA after displacement and multiplier effects	90
Table 42 Organisational and strategic benefits of SBRI: Phase 1 and Phase 2 winners	92
Table 43 SBRI influence on sourcing other external funding: Phase 1 and Phase 2 winners	92
Table 44 Organisational and strategic benefits of SBRI: Phase 1 and Phase 2 winners	93
Table 45 SBRI effects on product/services and IP: Phase 1 and Phase 2 winners.....	93
Table 46 SBRI effects on spin-outs business and technology: Phase 1 and Phase 2 winners	93
Table 47 Size of Applicant Firms to SBRI %.....	100

Table 48 List of Public Sector Bodies involved in SBRI by July 2014.....	107
Table 49 Calculation methods for Innovate UK Management Data.....	108
Table 50 Organisations Responding in WP2.....	109
Table 51 Organisations Responding in WP4.....	109
Table 52 Organisations Responding in WP5 Departments	109
Table 53 Organisations Responding in WP5 Firms / Participants.....	110
Table 54 Size Analysis of (non-MOD) SBRI Applicants	115
Table 55 Sectoral analysis of (non-MOD) SBRI applicants (SIC 2007).....	116
Table 56 Sample losses among SBRI applicants (Evaluation and Baseline surveys combined).....	118
Table 57 Response rates among applicants for the Evaluation and Baseline Surveys.....	119
Table 58 Composition of the target population of applicants: Evaluation Survey, % firms	120
Table 59 Composition of respondents to Evaluation Survey: By summary sector and size band.....	121
Table 60 Weights by Size band and broad sector: Evaluation Survey.....	122
Table 61 Composition of the target population of applicants: Baseline Survey, % firms.....	123
Table 62 Composition of respondents to Baseline Survey: By summary sector and size band	124
Table 63 Weights by Size band and broad sector: Baseline Survey	125
Table 64 Year business was first established (% of firms)	178
Table 65 Business type	179
Table 66 Percentage of employees with a degree level qualification or higher	179
Table 67 Proportion of goods and service inputs that are sourced from within the UK	180
Table 68 Further details: new or significantly improved products / services introduced (last 2 years)	181
Table 69 Proportion of overall turnover allocated to R&D and innovation (last 2 years).....	182
Table 70 Awareness of government support schemes for R&D and innovation	182
Table 71 How do firms hear about SBRI?.....	183
Table 72 Main reason for seeking SBRI support: winners and non-winners.....	184
Table 73 Views of the application process: winners and non-winners, % agreeing, 2013-14	184
Table 74 Outcomes where Phase 1 project applications were rejected.....	185
Table 75 Number and phase of competitions run by various departments October 2008 – August 2010	194
Table 76 Numbers of applications, competitions, contracts and contract value (Breakdown according to departments) October 2008 – August 2010.....	194
Table 77 Innovate UK co-fund (Breakdown according to departments) October 2008 – August 2010 .	195
Table 78 Number and phase of competitions run by various departments September 2010 – September 2012.....	195
Table 79 Numbers of applications, competitions, contracts and contract value (Breakdown according to departments) September 2010 – September 2012	196
Table 80 Innovate UK co-fund (Breakdown according to departments) September 2010 – September 2012.....	196
Table 81 Number and phase of competitions run by various departments October 2012 – July 2014 ...	197
Table 82 Numbers of applications, competitions, contracts and contract value (Breakdown according to departments) October 2012 – July 2014	197
Table 83 Innovate UK co-fund (Breakdown according to departments) October 2012 – July 2014.....	198

Annex 13 Table of Figures

Figure 1 Choice of Procurement Procedure under New Procurement Directive.....	18
Figure 2 Phases of Procurement, EU Reference Document.....	19
Figure 3 UK Approaches to PCP compared with the EU and the US.....	20
Figure 4 SBRI in Context	22
Figure 5 Mapping Programme Logic and Programme Steps.....	23
Figure 6 Cumulative Public-sector bodies (PSBs) engaged December 2008 – July 2014	32
Figure 7 Count of Operational and Policy Competitions by Form of Competition (P1, P2, P1+P2).....	45
Figure 8 Count of competitions by Year: December 2008 – July 2014	49
Figure 9 Count of contracts awarded by Year: December 2008 – July 2014	50
Figure 10 Value of contracts awarded by Year: December 2008 – July 2014	51
Figure 11 Total Expenditure on SBRI – All Target Departments by Year	66
Figure 12 Target and non-Target Department Comparison.....	67
Figure 13 SBRI Cumulative Contractual Value.....	68
Figure 14 Cusum Total Contract Value Awarded (Innovate UK Data set)	69
Figure 15 Cumulative Count of Public Sector Bodies Using the SBRI Programme.....	70
Figure 16 SBRI Programme Impact	81

END OF DOCUMENT