



Department for  
Business, Energy  
& Industrial Strategy

# Impact evaluation of Sharing in Growth

Report to the Department for Business,  
Energy and Industrial Strategy (BEIS) by  
SQW

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# Executive Summary

## Introduction

1. The UK aerospace sector is a high performing sector that is associated with high value jobs in aerospace supply chain businesses, often in economically deprived areas. However, the UK's share of the global aerospace supply chain is in decline, driven by the failure of many UK suppliers to achieve globally competitive standards of costs and performance. In response, the Sharing in Growth (SiG) programme was established with £84m of Regional Growth Fund (RGF) money in 2013. SiG aims to help transform the competitiveness of firms in the UK's aerospace supply chain – targeting firms with turnover of £5m-£100m. The SiG model provides long-term (four year), intensive and holistic leadership and management support. It is delivered through a 100-strong team of business coaches (including SiG staff embedded within the beneficiary firms) and support from a network of 15 specialist partners. A typical beneficiary firm receives around £1m worth of training and development over the four-year period. There is no upfront funding commitment to beneficiaries for this support, rather they match the value of support in-kind. The programme is delivered over three phases: first, a whole firm diagnostics assessment; second a “develop” phase of high intensity training over two years; and third, a “sustain” phase over 2-3 years to ensure that support is embedded.

## The evaluation

2. SQW was commissioned by the Department for Business, Energy and Industrial Strategy (BEIS) to undertake an impact evaluation of SiG. The overall purpose of the study was to assess the extent to which the programme achieved its intended impacts for UK aerospace suppliers. Specifically, the evaluation sought to answer the following research questions.

### **Figure 1: Research questions**

#### Context and rationale

- What type of market failures, if any, is the programme addressing? Are these failures still relevant and valid?
- How, if at all, do SIG participants interact with other sector specific interventions, particularly with the Aerospace Technology Institute (ATI) and National Manufacturing Competitiveness Levels (NMCL) programme?

#### Outcomes and impacts

- To what extent, if at all, has participation in the SiG programme:
  - Led to improvements in operational competitiveness, leadership behaviours and business strategy for beneficiary businesses?

- Affected the value of contracts won and/or retained?
- Created/safeguarded additional jobs?
- Affected the competencies and skill level of staff in beneficiary companies?
- To what extent, if at all, has the SiG programme:
  - Led to an improvement in performance of the wider UK aerospace supply chain?
  - Achieved its initial aim of levelling regional unemployment levels?
  - Contributed to skills development and promoted innovation in the wider sector, and knowledge spillovers into other sectors?
  - Generated unintended consequences for companies or/and the wider sector?
- What long-term impacts, if any, could be achieved by the programme and how can they best be measured?

Source: SQW, informed by the Study Specification and scoping consultations with BEIS

3. The evaluation adopted a theory-based approach involving contribution analysis to test the extent to which outcomes and impacts have occurred as a result of the SiG programme, compared to the programme's logic model and theory of change, including other factors that might have influenced outcomes. Following an initial scoping exercise, the evaluation involved both qualitative and quantitative evidence gathering, including the tasks summarised below.

### **Figure 2: Methodology**

- Scoping consultations, and refinement of the SiG logic model and Theory of Change
- Collation and analysis of programme monitoring data, and international contextual review of comparator aerospace sector data and support programmes
- Interviews with 12 SiG management staff and delivery partners, and 11 wider external stakeholders (including sector representative organisations)
- Telephone interviews with 33 of the 76 business participants, which represented 44% of the beneficiaries still trading at the time of fieldwork
- Follow-up, in-depth case studies with eight beneficiary businesses
- Econometric analysis of net effects on key outcome measures, comparing the performance of SiG beneficiaries to six comparator groups using regression based Difference-in-Difference techniques

Source: SQW

4. The businesses surveyed were broadly similar to the wider beneficiary population in terms of size and the timing of when they engaged with the programme. Most of the beneficiaries were still in receipt of SiG support, reflecting the population.

## Key findings

### Assessment of rationale (Section 4)

5. **Overall, the evaluation found that the original rationale for intervention was – and broadly still is – relevant and valid.**
6. The evidence from stakeholders and delivery partners suggests that the uncompetitive position of the UK relative to other countries was due in part to the sub-optimal business processes, practices, and investment within UK supply chain firms, which in turn was linked to inadequate leadership/management knowledge, skills and capabilities. On the demand side, the evaluation evidence pointed to information failures, including the lack of knowledge on the scale and pace of change needed in supply chain firms, the potential benefits of investment in training and, in some cases, where to access relevant training support, leading to underinvestment in training. The programme was also predicated on the scope for positive externalities for the sector as a whole (through knowledge spillovers) and creating jobs in more deprived parts of the UK (in line with RGF objectives). Although support was available from private sources, this was deemed narrow in focus (i.e. they typically focussed on specific issues, rather than the entire business) and prohibitively expensive, particularly given the scale and breadth of support required to achieve transformative change, which added a “layer of risk” to investment decisions (particularly where firms lacked information on potential benefits). Supply-side failures were evident but less significant: issues were raised in relation to the relevance of existing private sector support to supply chain firms (both in terms of aerospace expertise and tailoring for smaller supply chain firms) and co-ordination failures (in terms of challenges in bringing together expertise from different providers to address firm challenges holistically).
7. **There is strong evidence to suggest SiG addressed information failures** particularly in understanding the value of investment in leadership, management and training. However, **issues around affordability of support required for transformational change remain**, especially in the current economic climate for the aerospace sector.

### Assessment of implementation/ interaction with wider support (Section 4)

8. **Between 2013 and the end of December 2020, SiG had met or exceeded all Key Performance Indicator (KPI) targets, including programme lifetime targets to the end of 2022, and levered a substantial amount of private sector investment.** Over the same period, SiG had spent c. £68m of public funding on programme delivery and levered c. £135m from the private sector. A total of 76 businesses had received support, with an average of 50,000 hours of training per business. Overall feedback on the support received was largely positive: most beneficiaries surveyed (29 out of 33) were satisfied or very satisfied with their engagement with SiG, and two-fifths of respondents said they would recommend SiG unreservedly.
9. **SiG’s offer is distinctive but the wider “ladder of support” for this sector could be working more effectively in practice.** SiG is intended to complement other business

support programmes aimed at the aerospace industry. According to the Aerospace Sector Deal and the Aerospace Growth Partnership, this includes the performance improvement ‘Ladder’ comprising of three Supply Chains for the 21st Century (SC21) programmes (managed by the ADS Group): SC21 Lite, SC21 Operational Excellence, and SC21 Competitiveness and Growth (the latter uses the National Manufacturing Competitiveness Level). Of these programmes, SiG is designed to provide the most intensive support and companies are (in theory) able to progress from lower to higher intensive programmes. Other relevant sector support outside of the ‘Improvement Ladder’ includes the Aerospace Technology Institute (ATI) and the National Aerospace Technology Exploitation Programme (NATEP).

10. The evaluation found that SiG’s intensive, long-term, holistic, co-ordinated offer differentiated it from the wider support landscape identified above. SiG was designed to sit at the top of a “ladder of progression”. In practice, SiG did not duplicate other support available and appeared to complement other R&D support, but few beneficiaries had accessed other aerospace support programmes before, during or after taking part in SiG. There was concern from a minority of external stakeholders regarding the lack of a clear, joined up pathway for firms through the support on offer (both in terms of aerospace specific and generic support). There was also mixed feedback from stakeholders on the effectiveness of SiG’s engagement with external organisations and programmes.

### Assessment of direct outcomes (Sections 5 and 6)

11. There is strong and consistent evidence on the positive impact of SiG on leadership attitudes and behaviours, business culture and workforce skills, knowledge, and capabilities. The large majority of survey respondents had observed an increase in knowledge and skills, including management and leadership skills alongside a range of wider technical skills. The majority of beneficiaries have also improved their capabilities in business processes and practices as a result of SiG, progressing from ad hoc business practices, to formally defined steps, managed result metrics, and active optimisation of processes. SiG has also changed business culture, with improved leadership and management behaviours, combined with better workforce engagement and confidence: these shifts have taken time to achieve, but both have been important in enabling and sustaining change over the longer term. Looking forward, there is strong evidence to suggest SiG has changed attitudes and behaviours towards the value of investment in training, in line with the original rationale, and some beneficiaries are now more willing to pay for elements of private sector support.
12. **A key finding from the evaluation is that SiG has enabled firms to actually implement change** - not just identify what needs to change and/or improve skills for change. The large majority of beneficiaries surveyed have introduced new processes and practices as a result of SiG, which have reduced costs (e.g. through improved efficiency, cost avoidance, reduced wastage, and improved supply chain management), improved productivity (self-defined), and reduced variability/improved quality of outputs.
13. **Improved competitiveness had led to firms winning new and/or retaining existing contracts**, with SiG helping firms to diversify their client base into overseas and non-

aerospace markets. The monitoring data highlights substantial variation in the scale of contracts won/retained across firms, with some ‘big wins’ and a long tail of beneficiaries for whom the value of contracts won/retained is comparatively small (80% of the contract value attributed to SiG is accounted for by 32% of firms). Most businesses are on the programme for two years before they begin to realise contract benefits, highlighting the importance of long-term, sustained support in order to realise benefits.

14. **The benefits described above have translated into increased jobs and turnover, and both impacts are statistically significant.** Between 2013 and 2019, the econometric analysis estimates SiG created approximately 2,500 to 3,495 additional jobs and generated a net impact on turnover of £799m to £1,145m across all beneficiaries. In our view, the impacts of the programme are likely to be closer to the upper bounds of the above ranges for jobs and turnover estimates. The monitoring data suggests that the majority of jobs (89%) are based outside of London and the South East, reflecting the spatial distribution of aerospace firms and suppliers in the UK, including in some of the most deprived parts of the country. Outside of London and the South East, most jobs are located in the North West (20%), East Midlands (19%), Northern Ireland (17%), West Midlands (10%) and the South West (9%).
15. Moreover, there does not appear to be a trade-off between productivity improvements/cost reductions and jobs - most firms had achieved both. There was some evidence of increased salaries as staff become more skilled and capable as a result of SiG from the survey and case studies, but in the econometric analysis the impact on wages was not statistically significant. The survey results found a (self-reported) positive impact on firm-level productivity. However, productivity impacts were not found to be statistically significant in the econometric analysis, which may reflect the lag time before these impacts are observed in published datasets.
16. **SiG has led to unexpected consequences in a minority of cases:** on the downside, causing short term capacity issues and impacts on business performance; and on the upside, putting businesses in a stronger position to be agile and pivot in response to the challenges faced by Covid-19.

**Figure 3: Key outcomes as a result of SiG**

Key outcomes	Supporting evidence
Improved leadership and management behaviours	<ul style="list-style-type: none"> <li>• 79% of survey respondents had improved leadership and management behaviours</li> </ul>
Increased knowledge and skills	<ul style="list-style-type: none"> <li>• 82% of survey respondents had increased knowledge and skills</li> </ul>
Introduced new or improved processes / practices	<ul style="list-style-type: none"> <li>• 79% of survey respondents had introduced new or improved processes / practices, including management and operational practices</li> </ul>
New or retained contracts	<ul style="list-style-type: none"> <li>• £5.2 billion of contracts won or retained by end December 2020 (according to monitoring data)</li> <li>• 73% of survey respondent indicated an impact on contracts</li> </ul>



<p>New or safeguarded jobs</p>	<ul style="list-style-type: none"> <li>• Lifetime KPI target for ‘job years’ exceeded by end December 2020 (according to monitoring data)</li> <li>• 79% of survey respondents indicated employment benefits</li> <li>• The econometric analysis found a statistically significant impact on employment of beneficiaries, generating approximately 2,500 to 3,495 additional jobs across all beneficiaries between 2013 to 2019</li> </ul>
<p>Increased turnover</p>	<ul style="list-style-type: none"> <li>• 64% of survey respondents indicated an increase in turnover</li> <li>• The econometric analysis found that the impact of SiG on turnover is statistically significant, with a net impact estimated at £799m to £1,145m between 2013 and 2019</li> </ul>
<p>Increased productivity</p>	<ul style="list-style-type: none"> <li>• 73% of business surveyed reported an increase in productivity</li> <li>• However, the econometric analysis found that the productivity impacts were not statistically significant in data to 2019, which may reflect the lag time before these impacts are observed</li> </ul>

Source: SQW

17. Performance has been weaker in relation to R&D investment and innovation, and the development of new products/services. However, there were mixed views as to whether this was originally intended to be a goal of the programme.

### Assessment of wider impacts (Section 7)

18. **The evaluation found limited evidence of knock-on effects on skills or innovation across the wider aerospace sector, and mixed evidence of perceived knowledge spillover benefits.**
19. Beneficiaries and delivery partners believed that SiG had led to a more competitive and diverse aerospace engineering sector and had anchored future production and manufacturing in the UK, but this was primarily through directly supporting firms, rather than influencing the wider sector.
20. The most common examples of spillovers occurred within the programme between beneficiary businesses, with knowledge sharing facilitated by SiG (e.g. via STAR days), creating “a trusted network” of firms. Beneficiaries also argued that benefits had been achieved for their customers and suppliers, and to a lesser extent competitors and collaborators, as a result of SiG. Spillovers were mostly in the aerospace, manufacturing, and materials sectors. However, this evidence on spillovers should be treated with caution, as it is based on the perceptions of those consulted and not verified from groups reportedly experiencing the spillover benefits.
21. Overall, there was a lack of clarity across those consulted about SiG’s remit in terms of spillovers – given SiG’s intensive focus on a relatively small number of firms, a greater emphasis on ensuring mechanisms are in place to facilitate spillover benefits might be expected. Also, there was mixed feedback on the effectiveness of engagement and

partnership working with external stakeholders, which is an important route through which to influence the performance of the wider sector.

## Assessment of additionality and contribution (Section 8)

22. **There is strong evidence to suggest SiG brought about outcomes more quickly and at a larger scale than would otherwise have been achieved – and was the ‘critical’ contributory factor or an ‘important contributory factor alongside others’ – for the majority of businesses involved.**
23. The beneficiary survey found that outcomes would not have occurred at all or would have happened outside the UK for just over one-quarter of respondents, indicating full additionality. Outcomes would have occurred at a slower rate for half of the survey respondents without SiG (for many, five years or more) and for one-quarter outcomes would have occurred at a smaller scale. Deadweight is very low. These findings are positive given business survey respondents were still in receipt of SiG support, and the long timescales associated with outcomes being realised as a result of implementing firm level changes to processes and practices in the aerospace sector.
24. The business survey and case studies identified a range of other factors internal and external to business beneficiaries contributing to the outcomes described, but the majority of the respondents (67%) considered SiG to be the ‘critical’ contributory factor and as an ‘important contributory factor alongside others’. This positive finding was generally reinforced by stakeholders and delivery partners. As one delivery partner noted “SiG has been the mortar between the bricks and the spark that lit the fuse”.
25. **Overall, the evaluation found that the SiG programme has implemented activities as planned and translated these into key outputs, and short- and medium-longer term outcomes – as set out in the logic model and theory of change.**

## Key lessons and reflections (Section 9)

26. The two lessons considered most critical to future programme design and delivery relate to: **(i) SiG’s initial diagnostics process, which involves a ‘whole firm’/ holistic approach to assessing business transformation, and (ii) the embedded and long-term on-site presence of SiG staff to ensure that momentum is maintained, and changes are actually implemented and sustained in practice.**
27. On the areas that worked less well, a minority of businesses and stakeholders identified that in cases where businesses lack the capacity to engage in an intensive programme the “one intensive size fits all” approach may not be necessary or appropriate.
28. Finally, the evaluation found that greater consideration could be given to encouraging and evidencing wider impacts and spillovers, including the mechanisms that enable these to occur. This will help to maximise the potential impact from a programme that focuses significant resources on a relatively small number of firms.

# 1. Introduction

- 1.1 SQW was commissioned by the Department for Business, Energy and Industrial Strategy (BEIS) to undertake an impact evaluation of the Sharing in Growth (SiG) programme. The overall purpose of the study was to assess the extent to which the programme achieved its intended impacts for the UK's aerospace suppliers<sup>1</sup>. The evidence from the evaluation will be used to inform future policy decisions in relation to SiG.

## About Sharing in Growth

- 1.2 Established in 2013, SiG provides funding for tailored training and development to the management and leadership<sup>2</sup> of UK aerospace supply chain businesses. The programme is funded through £84m of Regional Growth Fund (RGF) money claimed by the end of December 2020 and nearly £135m in industry contributions<sup>3</sup> (time in-kind) by this point. The primary aims of SiG are to help improve workforce capabilities and transform the overall competitiveness of participating businesses. It also aims to address barriers to investment in innovation, improve firm-level productivity, and secure high value jobs in economically deprived areas<sup>4</sup>.
- 1.3 The training is provided by SiG's 100-strong team of business coaches, with additional support available from a network of 15 specialist partners (public and private). A typical beneficiary business receives c. £1 million worth of training and development over a four year period. There is no upfront funding commitment to beneficiaries for this support, rather they must match the value of support in-kind.
- 1.4 The support covers a range of relevant disciplines, for example: lean operations, manufacturing processes, strategy development, and leadership. This is across different business sizes and stages of development – targeting those with turnover of £5m-£100m. This encompasses a wide range of supply chain firms operating across multiple sectors including aerospace and other manufacturing such as machining and fabrication of metal products. By December 2020, the programme had supported 76 companies. On average, these companies had around 200 employees (with a wide range from 42 to 705) and a turnover of £22 million (ranging from £4 million to £92 million).
- 1.5 Out of 75 companies which have or are being supported by SiG (and were still trading at the time of this evaluation), only nine companies formally operate within the aerospace sector according to Companies house data and the National Statistics framework of

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<sup>1</sup> Based on a logic model developed during the scoping phase of the evaluation, in consultation with BEIS and based on a review of programme documentation (e.g. the original business case for SiG, and RGF application forms). Note, objectives have evolved over time.

<sup>2</sup> Note, SiG covers management and leadership in the widest sense, with some businesses receiving support and training across the wider workforce to support changes to business practice.

<sup>3</sup> SiG forecast c.£170 over the programme period.

<sup>4</sup> The latter reflects the programme's funding from the RGF which was set up to support jobs in high unemployment areas of the UK after the Global Financial Crises of 2007-08.

classifying companies – the majority operate in other related manufacturing sectors. Throughout this report references to the ‘aerospace sector’ refers to this wider scope of aerospace and non-aerospace supply chain companies which are already supplying or aim to supply aerospace goods and services, usually to the aerospace manufacturing sector covering both civil and defence applications. This has an implication on interpreting ‘impacts’ – for example, the majority of the jobs created by SiG support will be in the non-aerospace sector in terms of the ‘official classification’ but are part of its supply chain since they manufacture aerospace products<sup>5</sup>.

- 1.6 The programme is bespoke, intensive and operates over several years to assist businesses to embed management practices and business processes. It is endorsed by the large aerospace corporates including Rolls-Royce, Airbus, BAE Systems, Bombardier, General Electric (GE), GKN, Leonardo, Lockheed Martin, MBDA, Safran and Thales.

## Evaluation questions and scope

- 1.7 Following the scoping phase of the study, it was agreed with BEIS that the evaluation was to address the eleven evaluation questions identified below, and cover the duration of SiG since it was established in 2013.

**Table 1-1: Research questions**

Context and rationale	
1	What type of market failures, if any, is the programme addressing? Are these failures still relevant and valid?
2	How, if at all, do SiG participants interact with other sector specific interventions, particularly with the Aerospace Technology Institute (ATI) and National Manufacturing Competitiveness Levels (NMCL) programme?
Outcomes and impacts	
3	To what extent, if at all, has participation in the SiG programme led to improvements in operational competitiveness, leadership behaviours and business strategy for beneficiary businesses?
4	To what extent, if at all, has participation in the programme affected the value of contracts won and/or retained?
5	How many additional jobs have been created/safeguarded as a direct result of the programme?
6	How, if at all, has participation in the programme affected the competencies and skill level of staff both in beneficiary companies and in the wider sector?

<sup>5</sup> Note, none of the SiG companies were in the auto or marine sectors but there could be spillovers into these sectors as discussed in Section 7.

7	To what extent, if at all, has participation in the SiG programme led to an improvement in performance of the wider UK aerospace supply chain?
8	To what extent, if at all, has the programme achieved its initial aim of levelling regional unemployment levels?
9	How, if at all, has SiG contributed to promoting innovation in the wider sector, and knowledge spillovers into other sectors?
10	What unintended consequences, if any, has the programme generated for companies or/and the wider sector?
11	What long-term impacts, if any, could be achieved by the programme and how can they best be measured?

Source: BEIS; SQW

1.8 It is important to highlight that the focus of the study was to assess the market failures addressed by the programme, and the outcomes and impacts it generated<sup>6</sup>. The original remit did not include a process evaluation assessing programme delivery. Although this is important when providing a more holistic assessment of any programme (and the benefits it generates), it was not an explicit part of the scope of our evaluation. However, during the evaluation, BEIS expressed interest in capturing any key lessons relating to SiG delivery. We have tried to accommodate this request where possible and appropriate – based on the available evidence. The findings on delivery aspects should therefore be interpreted with caution as we have not undertaken a formal assessment of SiG’s processes. Nevertheless, the findings offer some key insights for further consideration by BEIS and the SiG team<sup>7</sup>.

## Approach and methods

1.9 Our approach involved a theory-based assessment to test the extent to which outcomes and impacts have occurred as a result of the SiG programme – in line with the programme’s logic model and theory of change. It compares the evidence on what was expected to happen as a result of the intervention against what has actually happened.

1.10 Specifically, the assessment involved using contribution analysis to test the evidence on outcomes and impacts, whilst considering other factors (internal and external to the business) which may have contributed to these benefits. Our approach, therefore, draws on both qualitative and quantitative data. The main methods included: collation and analysis of programme monitoring data, international comparator review, business beneficiary interviews, stakeholder interviews, delivery partner interviews, case study

<sup>6</sup> To note, the programme is also subject to KPMG/PWC annual programme audits and was covered by the NAO audit of BEIS’ programmes in January 2020.

<sup>7</sup> It is also worth highlighting that a value for money assessment was not within the scope of the evaluation.

work, econometric analysis, and testing the findings against the programme logic and theory.

1.11 Consistent with the overall approach outlined above, the evaluation work was undertaken in three phases of activity outlined below. It is worth highlighting there was some overlap of tasks between the three phases rather than being three separate sequential activities of work.

- **Phase 1 – Set-up, scoping and secondary data analysis**
- **Phase 2 – Interviews with stakeholders, businesses and case studies**
- **Phase 3 – Analysis and triangulation of evidence and reporting.**

1.12 The first phase of the study involved an inception meeting with the client group, review of programme documentation and monitoring data (including progress against KPIs), scoping discussions with representatives from BEIS, SiG delivery team and external stakeholders; refining the logic model and theory of change; international contextual review of comparator aerospace sector data and support programmes in France, Germany, Spain and the USA; finalising the methodology including a scoping paper. This was discussed with the client and updated following feedback from independent peer reviewers.

1.13 Phase 2 involved primary fieldwork, summarised in Figure 1-1 below. This included telephone interviews with stakeholders, business beneficiaries, and case studies.

- Interviews with 33 of the 76 business participants were completed<sup>8</sup>. This represents 44% of the beneficiaries still trading at the time of fieldwork (75 in total). The survey population was broadly similar to the wider beneficiary population in terms of size (measured by FTE staff and turnover) and the spread of dates over which they started the programme.<sup>9</sup> Most of the beneficiaries were still in receipt of SiG support, reflecting the population. Five had finished the SiG programme early.
- The purpose of the stakeholder interviews with SiG delivery partners and other external stakeholders was to obtain views on the rationale for programme, benefits of the programme to participating businesses, the influence it has had on the wider aerospace sector, and in the case of SiG delivery partners to explore the design and delivery of the programme. Consultations with delivery partners was added to the approach in direct response to peer review of the scoping paper.
- Case studies were undertaken with SiG participants to understand the experience of eight beneficiary companies in more detail<sup>10</sup>. The main purpose was to understand how SiG brought about outcomes and impacts reported. The cases were selected based on a range of factors: types and intensities of support; timing of support; where SiG worked

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<sup>8</sup> The remaining nine businesses did not provide SiG with consent for their details to be shared with SQW.

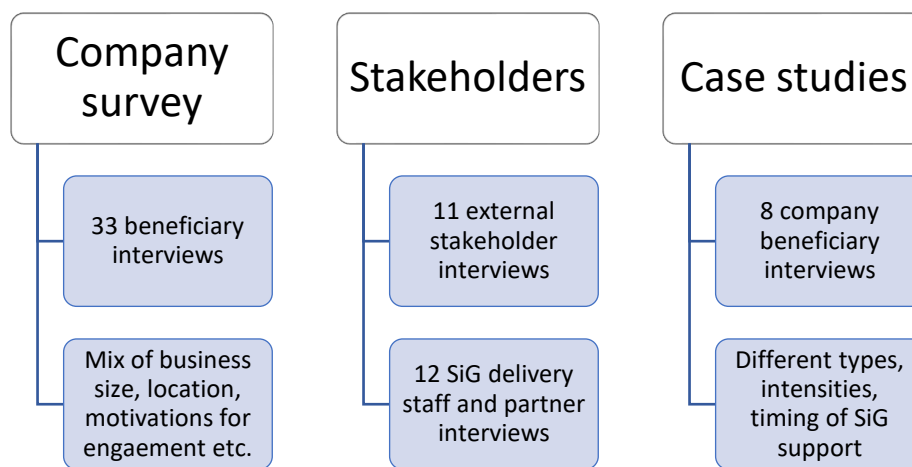
<sup>9</sup> Given the 44% response rate to the business survey, we estimate that the margin of error in the survey results is 13 percentage points (at the 95% confidence level). For example, if 50% of respondents indicated a specific result, we can be confident that the true result in the population is between 37% and 63%.

<sup>10</sup> The case study firms were recruited from the survey respondents who stated they would be willing to participate in a follow-up discussion.

well and less well; different combinations of outcomes experienced by businesses, levels of additionality; and any supply chain/ spillover impacts.

- 1.14 The original methodology also included a telephone survey of unsuccessful applicants. However, in order to ensure GDPR compliance, it was necessary for SiG to issue opt in emails to beneficiaries and unsuccessful applicants to gain consent to share contact details with SQW for the purposes of the evaluation. Very few unsuccessful applicants opted into the evaluation. Consequently, a comparison between beneficiaries and unsuccessful applicants was not possible. We received contact details for two unsuccessful applicants from SiG and one participated in an interview.

**Figure 1-1: Primary research**



Source: SQW

- 1.15 In the second phase, we also undertook preliminary econometric analysis to provide interim results on key outcome measures: employment, turnover and turnover per employee (proxy for productivity). Emerging findings from the desk review of documentation and monitoring data, stakeholder interviews, and initial econometric analysis were presented in an interim report to BEIS.
- 1.16 The final phase involved further analysis of the programme’s impact (including econometric work), and triangulation of all the evaluation evidence from the different research strands. An assessment was made against the theory-based framework described earlier in this Section - testing the underlying logic and theory of change as to whether the SiG programme delivered the intended outcomes and impacts.

## Report structure

- 1.17 The remainder of this report is structured as follows:
- **Section 2** provides an overview of SiG, the context in which it operates and how it compares internationally
  - **Section 3** assesses the rationale for SiG



- **Section 4** examines the activities and outputs delivered by the programme
  - **Section 5** assesses the outcomes for beneficiaries
  - **Section 6** presents results of the econometric analysis of impacts
  - **Section 7** discusses wider impacts on the aerospace sector
  - **Section 8** presents evidence on the additionality and contribution of SiG
  - **Section 9** summarises key lessons learned
  - **Section 10** presents the conclusions from the evaluation.
- 1.18 Five supporting annexes are provided: consultee list; detailed methodology for the econometric analysis; summaries of eight case studies; business survey results; and findings from the international context review.



## 2. Overview of Sharing in Growth

### Key messages

The UK aerospace sector is a high performing sector that is associated with high value jobs in aerospace supply chain businesses, often in economically deprived areas (thus contributing to the national levelling up agenda). However, the UK's share of the global aerospace supply chain is in decline driven by the failure of many UK suppliers to achieve globally competitive standards of costs and performance. This is partly due to the challenges relating to poor management and leadership practices, operational performance, supply chain management, and lack of investment in R&D.

In response to these challenges, the SiG programme was launched in 2013 seeking to increase productivity and competitiveness of UK aerospace suppliers, and thereby grow the UK aerospace sector. **The original rationale for SiG is underpinned by a number of market failures and barriers, including relating to information and co-ordination, risk and under-investment, and potential positive externalities for the sector, particularly in terms of skills and supply chain integration.**

**The SiG model is long-term (four year), intensive and holistic leadership and management training and development support. This is delivered over three phases: first, a whole firm diagnostics assessment; second a “develop” phase of high intensity training over two years; and third, a “sustain” phase over two/three years to ensure that support is embedded and leads to improvements in beneficiary firms.**

**Whilst SiG is intended to work alongside and complement other business support programmes aimed at the aerospace industry (e.g. SC21, NMCL and support from ATI), its offering is distinctive due to the level of intensity, tailoring and long-term approach.**

- 2.1 In this Section, we provide an overview of the strategic and sector context in which SiG operates. We also introduce the SiG programme, including commentary on its rationale, delivery model and fit within the wider support landscape.

### Strategic and sector context

#### The Regional Growth Fund

- 2.2 The Regional Growth Fund (RGF) was created in 2010 against the backdrop of the 2008 financial crisis and the recognition that subsequent reductions in public spending would negatively impact some already relatively deprived areas to a greater extent than areas with a thriving private sector. Intervention was therefore justified on the basis of reducing regional disparities in economic performance, and tackling locally specific

market failures which were limiting private sector growth. The RGF programme has two key objectives, as follows:<sup>11</sup>

- to stimulate enterprise by providing support for projects/programmes with significant potential for economic growth, and **create additional sustainable private sector employment**
- to support in particular those areas and communities that are currently dependent on the public sector to **make the transition to sustainable private sector-led growth and prosperity**

2.3 RGF is formally targeted at the English regions, but organisations based elsewhere in the UK may be eligible for support if they “strongly satisfy other criteria to take part in the programme.”<sup>12</sup> In the case of SiG, these criteria include commitment, demand side factors (e.g. customer endorsement) and capability to deliver globally competitive performance.

2.4 RGF was therefore designed to support private sector growth and, in many areas of the UK, the aerospace sector is a good example of this. In the sub-section that follows, we have provided an overview of the opportunities and challenges for this sector.

## The UK aerospace industry

### The industry at a glance

2.5 The aerospace sector can be divided into commercial and defence aerospace sub-sectors, although companies often work across both. The sector makes a considerable contribution to the UK’s economy. ADS Group – the UK Aerospace, Defence, Sector and Space trade association – has estimated that in 2019 aerospace generated a **turnover of £33.9 billion, exported £31.8 billion and directly employed 114,000 staff** in the UK.<sup>13</sup> These jobs are also well paid, with annual earnings 42% higher than the UK average.

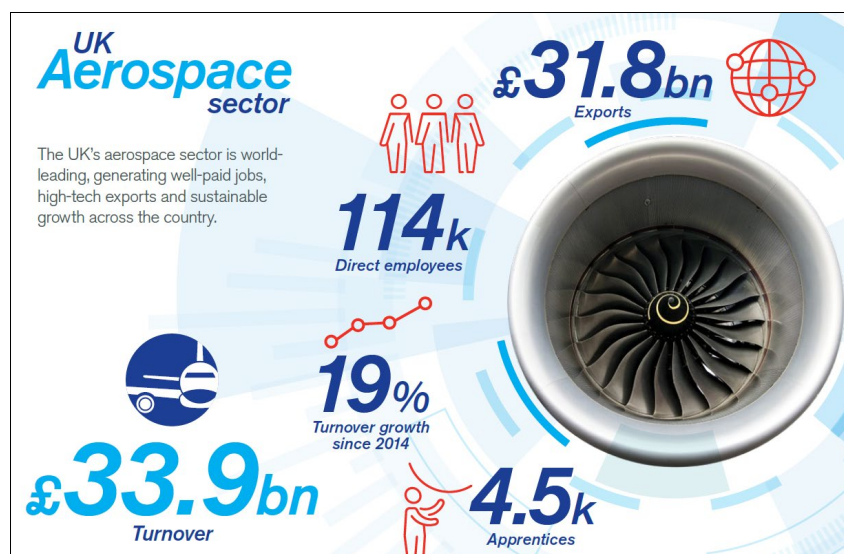
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<sup>11</sup> HM Government (2015) [Regional Growth Fund Annual Monitoring Report 2014-15](#)

<sup>12</sup> See SiG [Expression of Interest form](#)

<sup>13</sup> Whilst the aerospace sector is noted for its high productivity performance and economic importance, there are concerns about how well it is captured in official statistics. For example, although BRES data on employment by sector includes an SIC code for ‘Manufacture of air and spacecraft and related machinery’, this does not necessarily capture supply chain activity. Instead, cluster and sector bodies produce their own estimates.

**Table 2-1: Headlines on the scale of aerospace sector in the UK (2019)\***



Source: ADS Facts & Figures 2020; \* Aerospace is assumed to be 75% civil and 25% defence. All 2019 data is based on ADS estimates that were compiled before COVID-19.

- 2.6 However, **the sector has been significantly affected by the Covid-19 pandemic**, which has led to a dramatic reduction in passenger traffic globally, in turn affecting aircraft demand. Further, manufacturing activities in the sector have been restricted by the measures introduced to curb the spread of the virus. Whilst the sector is expected to start recovering in 2021, progress for commercial aerospace is likely to be slow if travel demand remains below the pre-pandemic levels.<sup>14</sup>
- 2.7 The aerospace sector is not concentrated in the more economically productive and prosperous areas, with 87% of aerospace jobs located outside of London and the South East.<sup>15</sup> Employment in major aerospace firms and their suppliers is distributed across the country, and often occurs in lower productivity areas such as the North West (including BAE Systems, Rolls-Royce and Safran in Lancashire), East Midlands (Rolls-Royce in Derby), West Midlands (Meggitt, Moog and UTC/Collins Aerospace) and South West (Airbus, MBDA and GKN in Bristol, GE Aviation in Cheltenham).

## Global competition

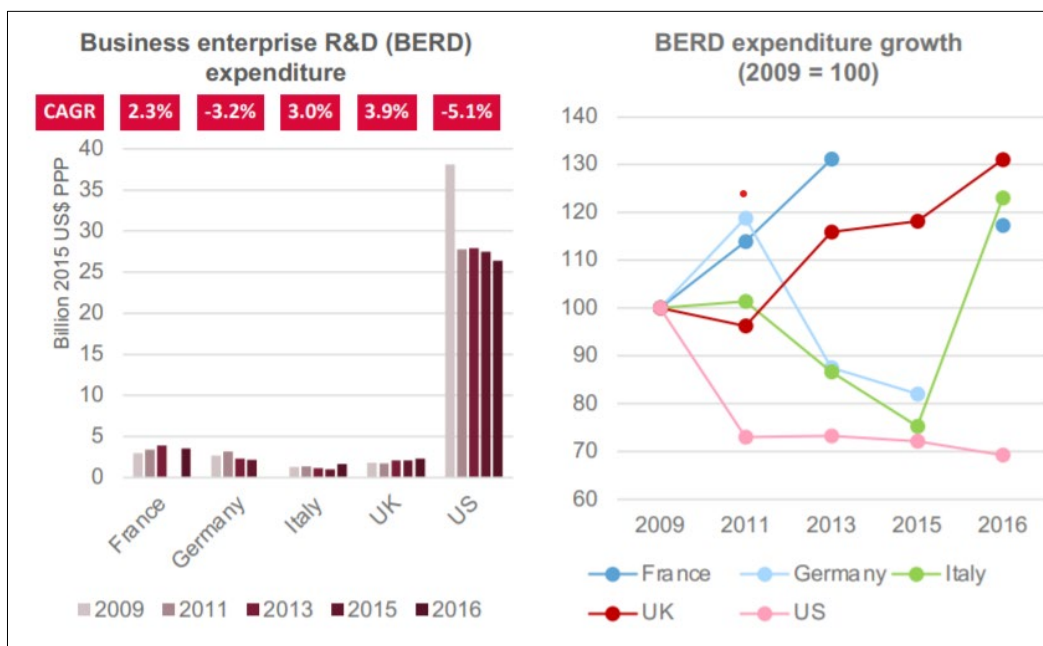
- 2.8 **Globally, the aerospace sector is defined by high levels of innovation and competition.** Countries such as Germany, France and the USA invest heavily to support their respective aerospace sectors in recognition of the economic benefits this brings. Part of the strategic basis for supporting the UK aerospace sector through interventions such as SiG is therefore to maintain a 'level playing field' against international competitors.
- 2.9 The rapid international comparator review conducted as part of this evaluation (see Annex E) summarised the performance of the aerospace sector in key competitor countries – Germany, France, Spain and the U.S – and identified publicly supported

<sup>14</sup> Deloitte (2021) [2021 Aerospace and Defense Industry Outlook](#)

<sup>15</sup> ADS (2020) [Facts & Figures 2020](#)

aerospace programmes, initiatives, institutions and organisations in these countries. The sector performance data indicates that the aerospace industry is a highly competitive international market, with the R&D investment for all comparators demonstrating strong support for their respective aerospace industries (Figure 2-1). This was emphasised through the range of policies, programmes, institutions and organisations relating to R&D and innovation and skills identified during the rapid review. This further highlights the strategic case for supporting UK-based aerospace suppliers to maintain competitiveness against international countries, particularly given the UK's current declining share in the global aerospace supply chain.

**Figure 2-1: Business enterprise R&D (BERD) expenditure in air and spacecraft and related machinery**



Source: University of Cambridge Institute for Manufacturing (2021) [UK Innovation Report](#)

Note: CAGR for countries are based on data for the first and last available years within the 2009-2016 range.

## Challenges

2.10 Whilst the aerospace industry is an important contributor to the UK's economy, there are challenges to capturing the full growth potential. Key challenges are noteworthy in this respect:

- **Global competition:** Aerospace is a globally competitive industry and technology is evolving rapidly. In recognition of this, the UK government provides support to aerospace companies undertaking innovation activities via the Aerospace Technology Institute (ATI) programme (formerly known as the Aerospace Research and Technology or ART) and assets such as the Catapult network, particularly the High Value Manufacturing Catapult (HVMC).
- **Supply chains:** Innovation from Original Equipment Manufacturers (OEMs) must be matched with improvements in supply chain capabilities so that all can share in the growth potential of the sector. However, previous research for BEIS (2016) found that

“one of the biggest issues facing OEMs in order to deliver this growth...is the management of their supply chain.” Specific issues highlighted include “a shortage of skilled manufacturing and advanced technology skills” and that “lower-tier companies may lack the management structure and processes required to achieve growth.”<sup>16</sup> Whilst OEM revenues were growing the same was not true for supply chain companies, indicating that perhaps supply chain work was not “sticking” in the UK.<sup>17</sup>

- 2.11 In addition, the original business case for SiG highlighted how the UK supply chain was **losing market share** to other countries due to a **lack of competitiveness**, and that this fall was expected to continue. For example, analysis by Deloitte<sup>18</sup> found that, between 2011 and 2013, the global aerospace market had grown by 20% whilst firms in the aerospace supply chain targeted by SiG<sup>19</sup> had grown by only 7%. According to research by SiG, the UK has an average cost gap of c. 20% across c.12 products compared to global benchmark standards.<sup>20</sup> The analysis showed that the existing performance gaps could be closed by providing suppliers with comprehensive business improvement training.<sup>21</sup>
- 2.12 There are several market failures and barriers which prevent aerospace suppliers from maintaining and improving the UK’s competitive position (set out in the box below).

### Market failures in aerospace

Key market failures include the following:

- Information failures: Lack of awareness of need to improve, where to find support and/or lack of information on future supply chain requirements from primes.
- Risk: Cost competitiveness/reduction challenge, and the high level of risk faced by businesses to change processes, bring about transformative change etc. Firms have to commit to price reductions in order to win contracts, which rely on future undefined improvements.
- Underinvestment: Firms underestimate the potential benefits of investment in training (and therefore are unable to build internal business case for investment). Benefits of management and leadership training that require commitment of high level staff are often intangible with the true value apparent afterwards. This, along with the fear of poaching of staff by competitors (free rider), results in high upfront costs and underinvestment in training.
- Co-ordination failure: Aerospace supply chain is fragmented and complex. It is difficult to locate suppliers, and so customers prefer to consolidate existing links.

<sup>16</sup> Department for Business Innovation and Skills (2016) [UK Aerospace Supply Chain Study](#)

<sup>17</sup> The Manufacturer (2018) [How does Sharing in Growth help UK aerospace benefit from rising OEM revenues?](#)

<sup>18</sup> Sharing in Growth 2 Case for Support.

<sup>19</sup> i.e. supply chain companies whose turnover is in the range of £5m - £100m pa.

<sup>20</sup> SiG (accessed March 2020) SiG Tranche 2 Due Diligence Presentation: Existing Scheme Performance.

<sup>21</sup> No data available on the level of under-investment in training.

There are also externalities associated with the following:

- Highly skilled labour pool: Positive knowledge spillovers resulting from labour mobility across firms
- Supply chain interactions: Underinvestment by suppliers to improve operational efficiency/ competitiveness, due to vertically integrated supply chains (firms can free ride off other businesses that have invested, become more competitive and therefore winning more orders), and a culture of complacency and lack of incentive to undertake costly improvement (when the business is still winning orders).

2.13 The Sharing in Growth (SiG) programme addresses these challenges by supporting supply chain companies to help improve their capabilities and, in turn, global competitiveness. The following sub-section introduces the programme.

## The Sharing in Growth programme

2.14 The SiG programme was launched in 2013 with funding from RGF (£84m disbursed to Q4 2020<sup>22</sup>) and industry contributions (£135m in kind by Q4 2020<sup>23</sup>). SiG originated from Rolls Royce Plc, who submitted the original RGF application through a newly established, not for profit company called “Sharing in Growth UK Ltd”. This is a subsidiary of Rolls Royce but has an independent board. Prior to SiG, Rolls Royce and other large aerospace primes were providing some development support directly to their own supply chains in the aerospace sector, but this was quite different to the scale, longevity, intensity, independence and holistic nature of support provided through SiG.

The overarching objective of SiG is to raise the capability of UK aerospace suppliers and their workforce in order to increase productivity and competitiveness, and thereby grow the UK aerospace sector.

2.15 SiG was created in response to the perceived lack of competitiveness within the UK’s aerospace supply chain which was recognised to be partly due to the challenges relating to poor management and leadership (M&L) practices, operational performance, supply chain management, and lack of investment in innovation. Specifically, SiG was designed to address the “root causes” of suppliers’ lack of competitiveness, set out in the business case as productivity, supply management, financial acumen and leadership capability<sup>24</sup>. The rationale for SiG is underpinned by the core market failures covered in the previous Section, suggesting that a longer term, intensive and holistic

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<sup>22</sup> Including two RGF contracts in 2013 (referred to in this report as ‘SiG1’) and 2015 (‘SiG2’; including a £6m extension in 2019).

<sup>23</sup> Including contributions from Rolls Royce (e.g. staff costs and access to facilities, intellectual property and networks) and beneficiaries (“in-kind” contribution, i.e. the value of the time of individuals participating in development or training).

<sup>24</sup> SiG 2 Business Case.



training and development is required for UK suppliers to maintain and improve the UK's competitive position and grow market share.

2.16 Specifically for aerospace suppliers<sup>25</sup>, the programme seeks to:

- improve workforce **capabilities**
- secure new/retain existing **contracts**
- create/safeguard **high value jobs** in deprived areas
- remove barriers to investing in **R&D and innovation**
- increase productivity
- increase competitiveness.

2.17 SiG offers beneficiaries an intensive, tailored programme of training and development typically focussed on leadership, culture, lean operations, manufacturing capability and sales. The training is provided by SiG's team of around 100 business coaches, with additional support available from a network of 15 specialist partners<sup>26</sup> including the High Value Manufacturing Catapult, the National Physical Laboratory and the University of Cambridge's Institute for Manufacturing. SiG is endorsed by large aerospace corporates, whereby each firm needs a prime customer as their 'sponsor' to participate in SiG.

2.18 **A typical beneficiary firm receives £1.2m worth of training and development over the four-year period.** There is no upfront funding commitment to beneficiaries for this support, but they must match the value of support in kind, e.g. through the value of the time of the staff participating in development training.

2.19 After the appraisal of applications, SiG support is divided into the following three stages:

- **Engage (10-12 weeks):** SiG staff will spend time with the companies to undergo an initial diagnostic assessment of all key aspects of the business in order to agree the most important areas to be addressed. This phase identifies the most relevant training and supports the business case for the beneficiary's participation in SiG.
- **Develop (c. 2 years):** A high intensity training programme delivered and managed by members of SiG staff who are based at the beneficiary business (full-time) and drawing on experts as and when needed (on a contract basis).
- **Sustain (2-3 years):** Ongoing support provided to businesses in order to ensure that the training is embedded and leads to improvements to the beneficiary company.

2.20 In addition to support for firms, the central SiG team also engages in a range of wider activities, including hosting events designed to encourage beneficiary networking and

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<sup>25</sup> In September 2020, SiG expanded its offering to the offshore wind sector, which is not covered in this evaluation.

<sup>26</sup> Alexander Mann Solutions; Deloitte LLP; Global Integration; Inspire TS Ltd; Institute for Manufacturing; Project 7 Consultancy; the Advisory, Conciliation and Arbitration Service (Acas); The University of Sheffield Advanced Manufacturing Research Centre (AMRC); National Physical Laboratory; Shipley UK; Toyota; Rolls Royce; Ubique Risk Management; High Value Manufacturing Catapult.

showcasing (e.g. All Star and STAR days) and more outward facing engagement and thought leadership activities in the wider policy landscape.

2.21 On the following two pages, we have set out the logic model for the programme, i.e. how the programme is expected to operate and intended outcomes and impacts.



**Figure 2-2: The logic model for SiG**

Strategy	
Context & rationale	Objectives
<p>The UK aerospace sector is a high performing sector that is associated with high value jobs in aerospace supply chain firms (incl. in economically deprived areas). However, the UK's share of the global aerospace supply chain is in decline. This is driven by the failure of many UK suppliers to achieve globally competitive standards of costs and performance e.g. UK has an average cost gap of c. 20% across c.12 products compared to global benchmark standards (SiG, 2020). This is partly due to the challenges relating to poor management and leadership practices, operational performance, supply chain management, and lack of investment in innovation.</p> <p>Thus, longer term, intensive and holistic training and development provided via SiG is required for UK suppliers to maintain and improve the UK's competitive position and grow market share. However, market failures and barriers prevent this from occurring. These include the following:</p> <ul style="list-style-type: none"> <li>• <b>Information failures:</b> lack of awareness of need to improve / where to find support / lack of information on future supply chain requirements from primes.</li> <li>• <b>Risk:</b> cost competitiveness/reduction challenge, and the high level of risk faced by businesses to change processes, bring about transformative change etc. (have to commit to price reductions in order to win contracts, which rely on future <i>undefined</i> improvements).</li> <li>• <b>Underinvestment:</b> lack of awareness of potential benefits of investment in training (and therefore inability to build internal business case for investment). Benefits of management and leadership training that require commitment of high level staff are often intangible with the true value apparent afterwards. This, along with the fear of poaching of staff by competitors (free rider), results in high upfront costs and underinvestment in training.</li> <li>• <b>Co-ordination failure:</b> aerospace supply chain fragmented and complex, difficult to locate suppliers, and customers prefer to consolidate than find and approve new suppliers.</li> </ul> <p>There are also <b>externalities associated with:</b></p> <ul style="list-style-type: none"> <li>• <b>Highly skilled labour pool:</b> via SiG support, and positive knowledge spillovers resulting from labour mobility across firms.</li> <li>• <b>Supply chain interactions:</b> underinvestment amongst suppliers to improve operational efficiency/ competitiveness, due to vertically integrated supply chains (firms have the ability to free ride off other businesses that have invested, become more competitive and therefore winning more orders), and a culture of complacency and lack of incentive to undertake costly improvement (when the business is still winning orders).</li> </ul> <p><i>Note: Other relevant issues that are not explicit in the documentation:</i></p> <ul style="list-style-type: none"> <li>• <i>Demand vs supply side rationale: The documentation indicates the predominant rationale is a demand-side issue i.e. the above market failures and barriers impede demand for longer term, intensive and holistic training. Little is referenced on supply side issues.</i></li> <li>• <i>The major cost differentials vs overseas competitors in this sector, and so UK supply chains developed solutions such as tech-based competitive edges to trump lower production costs. Is reducing costs and raising performance standards sufficient to solve the underlying competitive challenge faced in the UK?</i></li> <li>• <i>The role of Apex corporations in determining which firms supply, and the importance of perceived capability / maturity</i></li> <li>• <i>Organisational failure related to advanced digitisation in SMEs. SiG improves digital capabilities (e.g. accounting/supply chain integration), enabling firm to take advantage of more sophisticated digitisation opportunities</i></li> </ul>	<p><b>Overarching aim:</b></p> <p>Raise the capability of UK aerospace suppliers and their workforce in order to increase productivity and competitiveness of UK aerospace suppliers, and thereby grow the UK aerospace sector.</p> <p><b>Specifically for aerospace suppliers*:</b></p> <ul style="list-style-type: none"> <li>• Improve workforce capabilities</li> <li>• Secure new/retain contracts</li> <li>• Create/safeguard high value jobs in deprived areas</li> <li>• Remove barriers to investing in R&amp;D and innovation</li> <li>• Increase productivity</li> <li>• Increase competitiveness</li> </ul> <p><i>* Some tensions between objectives in short term, e.g. shift from loss-making/marginal profit business to growth opportunities could lead to short-term turnover reduction to release capacity for profitable business to be secured</i></p>

Delivery		Benefits		
Inputs	Activities	Outputs	Outcomes	Impacts
<p>Public investment from BEIS (£84m in <u>three tranches</u>)</p> <p>Requirement for private sector investment (in-kind time contribution to participate in SiG, converted to £m)</p> <p>Other private sector contribution from Rolls Royce (staff time, to value of £14m) and core improvement IP from RR Production System</p> <p>SiG staff &amp; 15 external delivery partners</p>	<p>Marketing Application and appraisal processes</p> <p>3 phases of long term, intensive, holistic support over 4 years:</p> <p><b>(i) ENGAGE, 3 months:</b> Intensive business diagnostic support, incl. maturity matrix &amp; leadership schematic</p> <p><b>(ii) DEVELOP, 20 months, followed by (iii) SUSTAIN, 24 months:</b> Technical, leadership and management expert advice and support from SiG staff situated within the business (average 2 FTE per business) and access to pool of experts, e.g. leadership, strategy, operational, supply chain, financials). Incl. annual reviews with businesses</p> <p>Activities also include:</p> <ul style="list-style-type: none"> <li>• Development of resources</li> <li>• Group knowledge transfer and best practice sharing activities</li> <li>• Off-site accredited training and development activities</li> <li>• Promotion activities</li> <li>• Strategic engagement activities of SiG team</li> </ul> <p>SiG governance structures and processes</p>	<ul style="list-style-type: none"> <li>• Applications reviewed / successful</li> <li>• No. of businesses receiving SiG support</li> <li>• Hours of training for business employees</li> <li>• Business diagnostics completed</li> <li>• Industry benchmarking data and case studies</li> </ul>	<p><b>Short term</b></p> <ul style="list-style-type: none"> <li>• Increase in knowledge/skills</li> <li>• Improved capabilities</li> <li>• Introduction and sustained adoption of new practices &amp; processes (e.g. leadership and management, lean production, financial business planning)</li> <li>• Increased investment (in R&amp;D, staff training &amp; development, capex)</li> <li>• Value of contracts won and retained £m (attributed to SiG)</li> </ul> <p><b>Medium / longer-term</b></p> <ul style="list-style-type: none"> <li>• Diversification of client base and/or products/services to market</li> <li>• Jobs created and safeguarded, via contracts won/retained, including in regions outside London/South East</li> <li>• Salary increases</li> <li>• Reduction in costs (via efficiency, avoidance, operational change)</li> <li>• Improved productivity / value add per person</li> <li>• Increased turnover and profitability</li> <li>• Export growth and reshoring (e.g. via securing overseas contracts)</li> <li>• Improved performance of delivery partners</li> </ul>	<ul style="list-style-type: none"> <li>• More competitive and diverse UK aerospace sector, with improved sector strength and resilience</li> <li>• Knowledge spillovers across aerospace and into other sectors</li> <li>• Future production and manufacturing anchored in the UK</li> <li>• Increase in UK-based GVA</li> </ul>

Source: SQW in collaboration with BEIS and SiG

2.22 The Theory of Change below outlines how SiG is expected to generate outcomes and impacts set out in the logic model (i.e. intended routes to impact.) and factors that may enable or hinder routes to impact which have been tested during the evaluation. For example:

- SiG marketing and selection process involves enquiries and initial discussions with potential business applicants. This leads to formal interest being expressed, due diligence, and eventually a full application ('Investment Proposal'). This assumes programme marketing is sufficiently effective to persuade businesses that are unaware (and aware) they need to change; demand is in line with programme scope; and effective business selection process is in place to identify need/failures.
- SiG's diagnostics support (Engage) delivered over 10-12 weeks leads to tailored support that specifically address the gaps in knowledge and skills in businesses that lack effective leadership and management practices. The output from this is the number of businesses completing the diagnostics. It is assumed that the support package is, in practice, tailored to meet specific business needs, and that this is more effective than signposting to other (generic) support.
- Following the diagnostic stage, intensive and long-term training is delivered over two years (Develop). The bespoke support (e.g. one-to-one training, classroom and applied training) is provided by SiG staff based at the beneficiary business (full-time) and draws on expert delivery partners (public and private). The on-site training is provided alongside peer-to-peer and off-site support (e.g. best practice sharing events, STAR days). The above assumes that businesses would not have paid privately for training ('activity additionalty'); and that SiG's bespoke, intensive, and long-term training actually translates into additional outcomes for businesses.
- The hours of training for business employees are expected to lead to improvements in skills, knowledge and capabilities. As a result, new practices and processes are introduced and adopted which in turn contribute to cost reductions, improved efficiency and productivity. Taken together, these outcomes lead to winning and retaining contracts for businesses. From this, medium to longer term outcomes are generated, notably: improved business performance through high value jobs, turnover, wages, productivity, and export growth. Alongside this, diversification of the client base is expected from the range of contracts won (e.g. from overseas).
- Assuming businesses are able and willing to maintain their engagement and commitment to SiG over the four year period, the above changes are expected to lead to businesses becoming more competitive, resulting in long-term impacts: more competitive and diverse UK aerospace and engineering sector with improved sector strength and resilience; knowledge spillovers across aerospace and into other sectors; future production and manufacturing anchored in the UK; increased UK economic output.
- Throughout, feedback loops are expected to occur, whereby SiG gives firms the skills and capabilities to adopt new practices effectively, with subsequent economic benefits in terms of contracts won and retained. This has a demonstration effect and de-risks

future internal investment in management and leadership training. In theory, this will lead to a sustained legacy of SiG, with further investment in training in future. SiG leads to sustained change, and businesses continue to invest and change.

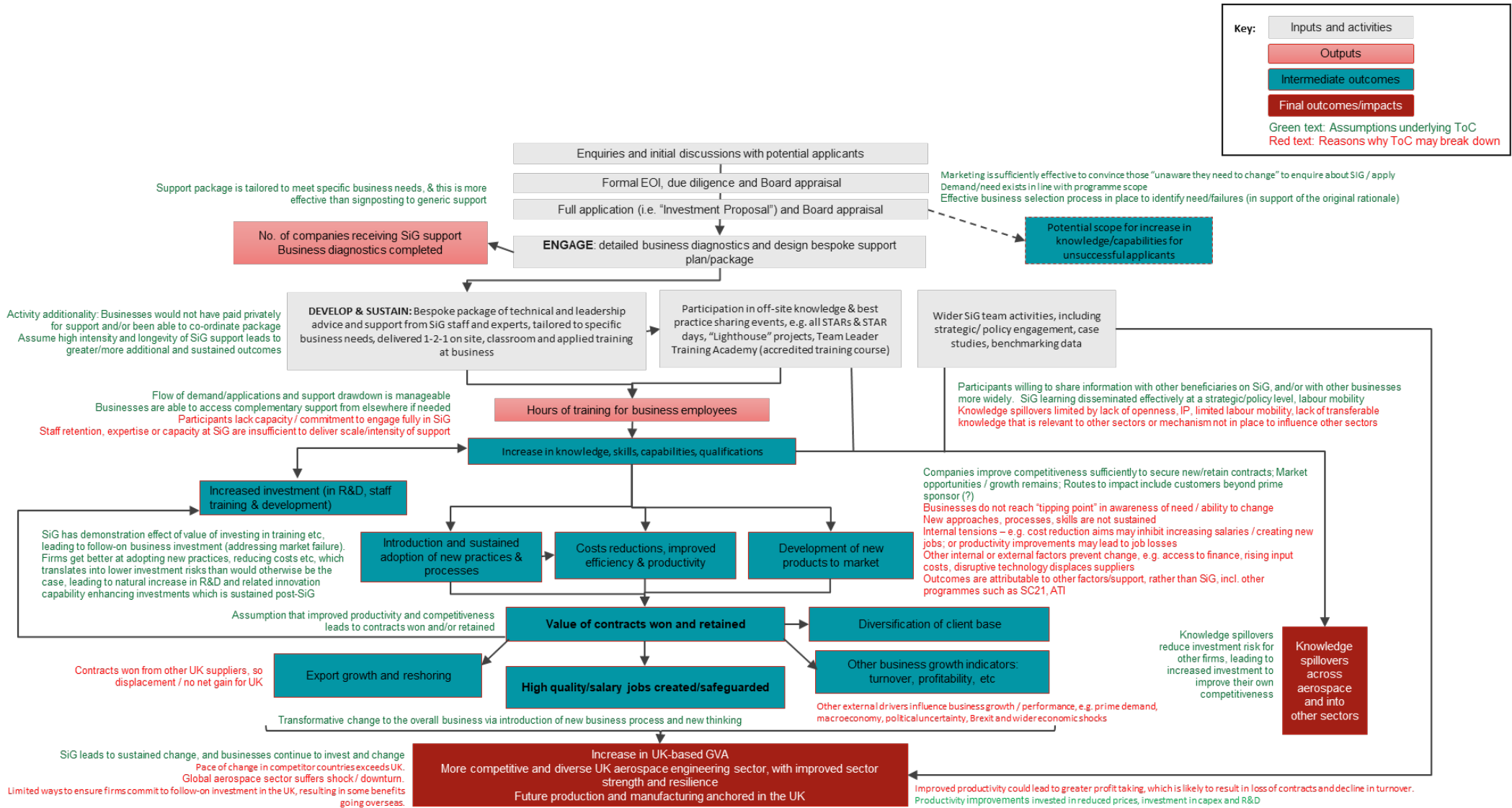
2.23 Further assumptions and alternative explanations to realising outcomes include:

- Businesses identified priorities as part of their own internal strategic development plans, and/or improvements would have happened in any case
- Businesses received other support that enabled outcomes to be achieved, and this was more important than SiG in instigating and sustaining change
- Businesses secured additional/ retained contracts anyway because of existing client relationships
- Other factors influenced outcomes including economic shocks, demand from Primes, facilities and access to markets – and are more important driver in reducing costs and improving competitiveness.

2.24 The Theory of Change is further detailed in Figure 2-3, followed by a summary of the key drivers, assumptions and alternative explanations. These have been tested during the evaluation.



Figure 2-3: Theory of Change for SiG



Source: SQW in collaboration with BEIS and SiG

**Figure 2-4: Drivers, assumptions and alternative explanations**

#	Driver	Assumptions/ hypotheses	Link to research questions	
Context and rationale	1	SiG provides funding and tailored support, helping to address barriers to workforce capabilities, competitiveness and investment	The longer term and intensive training provided via SiG helps to address barriers relating to: the adoption of management and leadership (M&L) practices, operational competitiveness, investment in innovation, and business performance. There are gaps in the knowledge and skills of businesses, which limits effective M&L practices, resulting in a negative impact on business performance. Businesses do not realise the need to change and/or do not know where to access support and expertise to improve management and leadership practices, and/or are unwilling to invest to cover full cost of support. Marketing is sufficiently effective to convince those “unaware they need to change” to enquire about SiG and apply for support.	#1
Selection and delivery	2	The SiG selection process means focus is on the right businesses	Reflecting the rationale, the SiG selection process has identified where there are market opportunities, competitiveness challenges/market failures and scope for additionality. Investment propositions and diagnostics/action planning demonstrates potential impacts. Demand/need exists in line with programme scope (taking in to account the supply of other services).	#1, 3
	3	SiG activities and delivery mechanism lead to sustained demand for SiG	The inputs and activities of SiG – particularly the long term, intensive, tailored M&L training – are appropriate and reflect demand.	#1, 3
	4	SiG businesses engage with other sector specific interventions	Businesses are able and willing to maintain their engagement and commitment to SiG. SiG participants receive support from other sector specific interventions before, during, or after engagement with SiG (particularly with the ATI and NMCL).	#2, 3
Outcomes and impacts	5	Businesses successful in improving workforce knowledge/skills/ capabilities	Businesses successful in improving workforce knowledge/skills/ capabilities, in turn leading to the sustained adoption of M&L practices and processes. Capital is available to implement change, and any changes in other external factors (e.g. input prices) do not outweigh impact of SiG.	#2, 3, 6
	6	Improvements lead to new/retained contracts, in turn new / retained high quality jobs etc.	Improvements in knowledge/skills/ capabilities lead to new or retained contracts, new / retained high quality jobs. Improved productivity and competitiveness also lead to contracts won and/or retained. Reducing costs, raising performance standards and capabilities, are sufficient to solve underlying competitive challenge and result in new/retained contracts. New / retained jobs would not have been achieved otherwise, because businesses could not justify the cost of investing in training etc privately or without support, and would not have improved performance sufficiently to win new/retain contracts.	#1, 4, 5, 8
	7	R&D and innovation lead to production and manufacturing anchored in the UK	R&D and innovation leads to businesses retaining their activities in the UK. The commitment to supporting capability development in the long term through SiG builds business confidence to base production in the UK. Businesses possess wider skills and networks required to successfully export overseas.	#4, 7, 9, 11
	8	Technologies / knowledge developed spillover to other sectors, as well as within the aerospace sector	Technologies / knowledge developed is cross-cutting or multi-purpose, relevant to and potential for adoption in adjacent sectors (e.g. offshore wind) leading to spillovers. SiG supports firms that supply different sectors (e.g. defence, automotive). Willingness and mechanisms/conditions in place to facilitate spillovers/knowledge transfer, leading to reduced investment risk for other businesses/sectors. Mechanisms assumed for spillovers include wider policy influencing work by SiG, cross-beneficiary knowledge sharing activities as part of SiG, delivery partners, via supply chains and staff movements.	#9, 11
<b>Alternative explanations:</b>				
<ol style="list-style-type: none"> <li>1. Businesses had already identified priorities already as part of their own <b>internal strategic development plans</b>, and/or improvements would have happened in any case given business commitment to them</li> <li>2. Businesses received <b>other support</b> that has enabled outcomes to be achieved, and this was more important than SiG in instigating and sustaining change</li> <li>3. Businesses would have secured additional/ retained contracts anyway, due to <b>existing supplier/client relationships</b></li> <li>4. Other <b>external factors/changes</b> are the most important driver in reducing costs (e.g. inputs) or improving competitiveness (e.g. performance of competitors). Other factors have assisted in leading to production in the UK, including facilities and access to markets.</li> <li>5. Knowledge generated is not the result of SiG, but from <b>other/previous/subsequent R&amp;T</b> and so spillovers cannot be attributed to SiG.</li> </ol>				

Source: SQW

## Intended fit within the wider support landscape

- 2.25 SiG is intended to work alongside, and be complementary to, other business support programmes aimed at the aerospace industry. The current business support landscape includes the following funding programmes alongside SiG:
- **The Supply Chains for the 21st Century (SC21) programme**, which was allocated £10m of Government funding in the Aerospace Sector Deal, is also endorsed as a continuous improvement programme by the Aerospace Growth Partnership's Supply Chain Competitiveness Charter. The programme comprises three strands: SC21 Lite; SC21 Operational Excellence (OE); and SC21 Competitiveness & Growth (C&G). SC21 C&G utilises the **National Manufacturing Competitiveness Level (NMCL)** system to assess a company's competitiveness and highlight areas where improvements could be made.
  - **The Aerospace Technology Institute (ATI)** provides funding for specific projects across four strands: the Strategic Programme; R&D Funding for Smaller Business; the **National Aerospace Technology Exploitation Programme (NATEP)**; and the International programme.
- 2.26 Compared to these other forms of support, SiG's offer is designed to be distinctive because it is intensive, tailored and long term and requires a significant commitment from the businesses involved.

## 3. Assessment of rationale

### Key messages

The evidence gathered from the business survey, case studies, stakeholders and delivery partners generally support the original rationale for SiG to: address UK aerospace suppliers' lack of international competitiveness – cost and quality of performance – due to the lack of leadership and management knowledge, skills and capabilities needed to bring about changes in business processes and practices that would improve competitiveness.

The market failures and barriers that underpin the rationale were primarily demand-side issues (i.e. beneficiary perspective).

- **First, information failures due to the lack of knowledge of the potential benefits of investment in leadership and management training; and businesses not having sufficient information on where to access relevant training and development support that was bespoke, intensive and holistic. As part of this, firms found it difficult to judge the quality of existing support and how to co-ordinate support from different providers.**
- **Second, high levels of risk associated with changing internal business processes to bring about transformative change, particularly in the aerospace sector where the costs and disruption of changing internal processes is very high.**
- **Third, underinvestment in training and development as existing private sector support was deemed prohibitively expensive and risky, particularly given the scale and breadth of challenges faced by these businesses. The underinvestment was also due to the lack of information on the potential benefits of training and development. Collectively, this made it harder to build business cases for investment.**

The evaluation found little evidence of businesses not being aware of the need to change, although we consulted with those who were “the converted”. External stakeholders and delivery partners observed this issue across the wider sector. SiG staff also noted that, whilst leaders may be aware of the need to change, few understand the scale or urgency of change required. A lack of knowledge around future customer requirements, or the shift towards consolidation of suppliers, was also not raised by those consulted.

Supply-side failures were less significant, but issues were raised in relation to the relevance of existing private sector support to supply chain firms (both in terms of aerospace expertise and tailoring for smaller supply chain firms) and co-ordination failures.



- 3.1 In this Section, we test the extent to which the original rationale for SiG holds true in practice, based on evidence from the beneficiary survey and case studies, and consultations with delivery partners and external stakeholders.

## Evidence on rationale

- 3.2 The rationale for SiG, as articulated in programme documentation, **primarily focused on demand-side failures** that were perceived to be driving the decline in competitiveness. Specifically, the lack of awareness of the need to improve or where to find support, the risk associated with having to commit to price reductions in order to win contracts (which relies on future undefined improvement in firms that may lack the capability to achieve these), and a lack of awareness of the potential benefits of investment in training (making it difficult to build internal business cases for investment) and associated risks of poaching after staff capabilities improve.
- 3.3 There was consistent feedback from external stakeholders, including key sector representatives, that the UK aerospace supply chain needed to be strengthened as it was (becoming) uncompetitive against international competition based on costs and/or quality, e.g. on time delivery, ability to deliver yearly cost reductions, and a consistent level of product quality.
- 3.4 From a beneficiary perspective, the key challenges that prompted engagement with SiG appeared to be a **recognition of declining competitiveness and the scale of the challenge** of addressing this. However, firms lack knowledge, skills, expertise and capabilities to transform the firm in house (13 out of 33 survey respondents highlighted this issue). Linked to this, case studies also highlighted some evidence of **historical under-investment** in leadership and management training, particularly in some family run firms – even where investment in technical skills across operational staff was commonplace. These issues were corroborated by external stakeholders and delivery partners.
- 3.5 Beneficiaries did not highlight a lack of awareness of the need to change within the firm (at least not for those consulted and leading the firm's engagement with SiG; but there were examples of this issue across the wider business though), a lack of information on future supply chain requirements/expectations, or challenges associated with customers seeking to consolidate rather than approve new suppliers. These issues were, however, identified by external stakeholders and delivery partners as key drivers underpinning the need for SiG. Moreover, SiG staff highlighted a nuance in that - whilst leaders may be aware of the need to change – through the delivery of SiG they have observed few firms fully understood the scale or the urgency of change required. As we discuss in more detail below, the diagnostics exercise was key to changing perceptions on this.

3.6 According to beneficiaries, the primary issue preventing firms addressing the challenge of declining competitiveness appeared to be the **prohibitive high and unaffordable cost and the lack of internal resources available** for this type of training, **particularly at the scale required to transform the firm** (14 out of 33 survey respondents, and six of eight case studies, highlighted resources as an issue). This is a key issue for the aerospace sector where the costs and disruption of changing internal processes are very high. The survey found around half of respondents had accessed leadership and management support commercially prior to SiG (15 out of 33). However, the case studies explored this further and found that the previous private support that firms were able to afford was narrow in focus, reactive to specific issues identified by the firm, lighter touch and short term. This often meant that solutions were narrow/partial (compared to the firm-wide challenges faced), improvements were not implemented or sustained in response to the advice provided, and overall, the pace of change was very slow. Fear of poaching was not raised as a barrier to investment.

3.7 Beneficiaries argued that private support was highly expensive, adding a “layer of risk” to decisions to invest in training. Also, firms had limited resources and competing priorities for investment, and found it difficult to justify the importance of investment in leadership and management. These issues were exacerbated where senior management were not aware or lacked evidence of the potential benefits associated with investment in this type of training. As one case study illustrated, this led to a real “resistance” to investment in a firm with a “traditional-thinking” culture (often those that are in most need of investing). Furthermore, another case study highlighted how finance is more readily available for capital investment (e.g. asset finance) but very difficult to secure for investment in people (see example below).

3.8 These findings were supported by the external stakeholders consulted, who also acknowledged the lack of existing finance for training. Delivery partners had also encountered issues around costs being prohibitively high and risky, and prioritisation challenges within firms. For example, for four of the delivery partners consulted, SiG had been the first major work they had undertaken with SMEs because their services were not affordable to small companies. Prior to SiG, delivery partners also commented on the nature of support provided to

*“As an SME we don't have spare resource, it is very much hand to mouth – we don't focus enough on internal processes and development of people as we should. Having someone like SiG embedded in the company brought us those rules, tools and procedures and forced us to improve processes and upskill people. We needed a programme like this to force us to make changes as trying to do this as well as day job or by getting someone external in is difficult.”*

*“We had engaged consultants before, but needed a holistic approach from SiG instead of siloed consultancies. ”*

Survey respondents

*“[SiG has provided a] channel to the SME market.”*

Delivery partner

firms, which tended to be narrowly focused on specific problems. With SiG they were integrated into a more holistic approach.

- 3.9 As described above, the evidence suggests the presence of **information failures**, where firms stated they did not know where to find support, and more specifically, which providers could be trusted or were good quality. A minority of beneficiaries also highlighted the challenge of **co-ordinating and sequencing support** from different providers (both public and private), and doing so across the breadth of challenges that needed to be tackled in order to realise transformational change.

#### **Case study example (5)**

Prior to engaging in SiG, the firm had received some public support, and had also sought private support from consultants which was deemed very costly. Internally, the firm faced competing priorities with large-scale capital investment required to expand capacity. Whilst it was clear that external finance would be needed for the transformation programme, accessing funds at the required scale and nature was difficult. Whilst private debt funding was available for capital investments (i.e. asset finance), borrowing for people development had not been possible. SiG provided the right type of support at an affordable level for an SME (i.e. including only in-kind investment). The support from SiG was required to help the firm mitigate the level of risk associated with changing business processes. The firm therefore saw SiG as a unique opportunity, offering an intensive approach which would enable the firm to revisit principles and strategy before progressing to implementing the changes. In comparison to other programmes that were seen more as a “medical check-up”, SiG was considered to be more “like being in a hospital where everything happens all at the same time”.

#### **Case study example (1)**

This family owned firm had not kept up to date with advances in manufacturing and management techniques so was not well positioned to bid for the more competitive aerospace contracts. Prior to SiG, the firm had tried to improve its competitiveness by investing in short term private sector support, but had not been able to sustain improvements. This was partly because there was not enough support to embed the changes and partly because some key employees later left the business. SiG support helped to address historic underinvestment in training at the firm, and a lack of knowledge internally about how to improve.

- 3.10 Whilst the market and other failures are weighted towards demand-side issues, evidence gathered for this evaluation suggests there are **also – albeit to a much lesser degree – some supply side issues**. Whilst support services are available in the marketplace, there appear to be issues relating to:
- **The relevance of existing support to smaller firms.** It could be argued this is largely a misconception of beneficiaries, where information failures mean they lack information on support. However, six delivery partners acknowledged their work in the aerospace

sector prior to SiG focused primarily on large primes<sup>27</sup> such as Rolls Royce and Bombardier, and had not supported many SMEs in the supply chain. Also, as we discuss in Section 5, three delivery partners also recognised their existing offer was not appropriately tailored to SME needs, and have since used their SiG experience to tailor and improve their service offering.

- **Co-ordination failures**, whereby existing support is siloed, rather than SiG's whole firm approach, and difficult to navigate. This was highlighted by beneficiaries and external stakeholders, who argued that existing support was hard to navigate.
- **Accessing relevant aerospace expertise and experience**: one case study found it difficult to find consultants with specialist knowledge of the aerospace industry, and some of the delivery partners acknowledged they had minimal experience of the aerospace sector.

3.11 There were mixed views on the extent to which SiG's rationale is still valid in its current form and whether the programme has fully addressed the original rationale. As discussed in Section 5, for those involved, there is strong evidence to suggest SiG has addressed information failures (particularly in understanding the value of investment in leadership management and training) but issues around affordability of firms to pay privately for support remain and are even more acute in the current context. In the design of support in future, this issue will need to be considered by policy makers.

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<sup>27</sup> The definition of a prime contractor varies, as highlighted in the [BIS \(2016\) UK Aerospace Supply Chain Study](#). This study defines prime contractors as "corporations that take on the total responsibility of a given project, and whose customers are the aircraft operators (airlines) or the airframe manufacturers".

## 4. Inputs, activities and outputs

### Key messages

A total of £84 million of state funds disbursed to SiG by Q4 2020 alongside £135 million contributed by the private sector. By the end of December 2020, SiG had spent £68.1 million of public funding on programme delivery. The remaining balance will be used to fund programme delivery for its remaining lifetime, through to 2022.

Across all five KPIs, programme performance was ahead of the targets set out in the RGF contracts by the end of December 2020, both for the evaluation period (i.e. up to Q4 2020) and for the whole programme (up to Q4 2022). **According to monitoring data provided by SiG, the programme had achieved the following by December 2020:**

- **entered into an agreement with 76 beneficiaries**
- **nearly 3.8 million hours of training received across beneficiaries, equivalent to an average of 50,000 hours per beneficiary firm**
- **nearly £135 million of private sector investment in the programme**
- **helped to win or retain contracts worth £5.2 billion**
- **helped to create or safeguard 48,519 job years.**

The contracts data demonstrates some ‘big wins’ in contracts won/retained, but also a long tail of beneficiaries for whom the value of contracts won/retained is comparatively small. However, whilst there is substantial variation in the scale of contracts won/retained across those participating in the programme, the programme is leading to a broader distribution of benefits across its portfolio of firms than is typically observed in business support programmes. Also, the data demonstrates the lag between improving leadership and management capabilities and operational change, and the impact on contracts.

SiG is contributing to the levelling up agenda, by virtue of the fact that the large majority of jobs created/retained are based outside London and the South East (according to monitoring data provided). This largely reflects the spatial distribution of aerospace firms and suppliers in the UK.

In terms of SiG’s fit within the business support landscape, evidence from stakeholder interviews suggests that SiG’s offer is seen as distinctive among public support programmes – it is intensive, long-term, holistic, co-ordinated support delivered by a team with sector-specific expertise and strong leadership. Whilst SiG is perceived to sit at the top of a “ladder of progression”, it was unclear to stakeholders how effectively the ladder of support works in practice. Around one-third of beneficiaries had accessed other public support either before or during SiG (although few had received other aerospace specific

support). The exception to this is R&D funding, where SiG appears to work alongside and complement wider R&D/innovation funding for many of those taking part.

- 4.1 This Section presents evidence on inputs, activities and outputs based on monitoring data (as at Q4 2020 provided by SiG in February 2021), stakeholder interviews and the beneficiary survey. When analysing monitoring data, figures for the whole programme are provided alongside a breakdown by the two RGF contracts in 2013 (referred to as 'SiG1') and 2015 ('SiG2'; includes the 2019 extension). The Section includes analysis of SiG's performance against its contracted Key Performance Indicators (KPIs):
- Hours of scheme funded training received
  - Number of beneficiaries that SiG has entered into an agreement with
  - Value of private sector contribution
  - Value of contracts won and retained
  - Number of job years created and safeguarded (based on contracts won and retained).
- 4.2 Performance by the end of December 2020 is compared to SiG's target to that point (i.e. December 2020) and the target to the end of the programme period (i.e. December 2022).

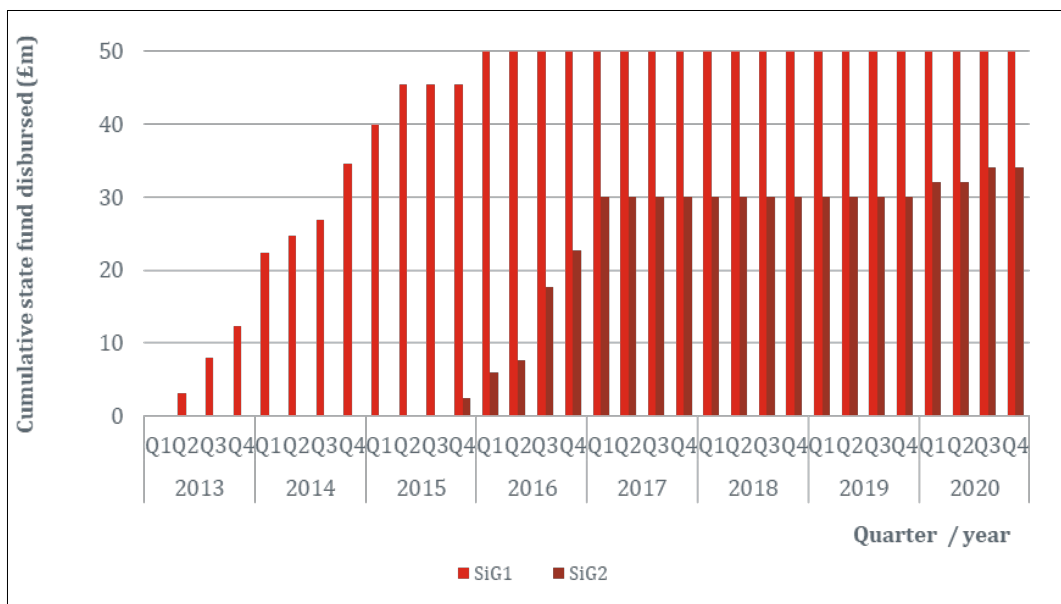
## Inputs

- 4.3 Since the programme's inception in 2013, a total of **£84 million of state funds have been disbursed for SiG** through RGF (£50 million to SiG1 and £34 million to SiG2).<sup>28</sup> Figure 4-1 shows the distribution of state funds disbursed over this period.

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<sup>28</sup> Note: In agreement with BEIS, SiG operates a complex mechanism to manage financial contributions to firms and State Aid requirements, alongside expenditure targets under the RGF contract. Assessment of this mechanism is not within scope of this evaluation, and is audited separately by KPMG.

**Figure 4-1: State funds disbursed across SiG1 and SiG2, 2013-2020**

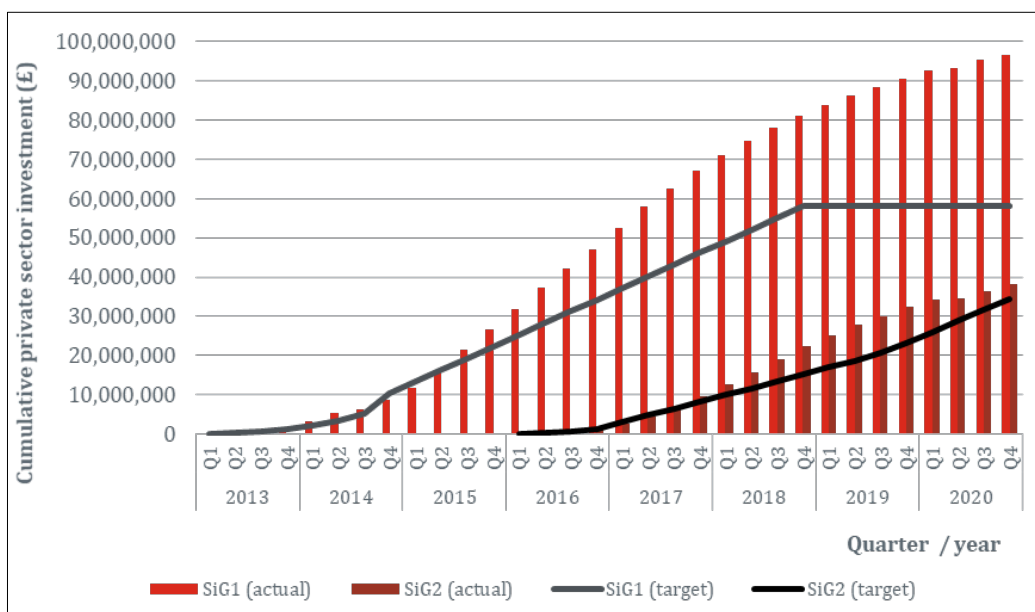


Source: SQW based on SiG monitoring data

4.4 Of this £84 million disbursed to the programme, SiG had spent £68.1 million by the end of December 2020. Around half of these costs are associated with resourcing (£42.3 million), followed by training courses (£12.7 million), expenses (£6.9 million), and operational and management costs (£6.2 million). The remaining £15.9m will be spent on implementation through to the end of the programme period (December 2022).

4.5 Alongside the RGF funding, **£134.8 million has been invested in the programme by the private sector** (including resources from Rolls Royce and in-kind contributions from the beneficiaries). This exceeds both the contractual target for up to Q4 2020 as well as the end of programme target (by 46% and 35%, respectively).

**Figure 4-2: Private funding across SiG1 and SiG2, 2013-2020**



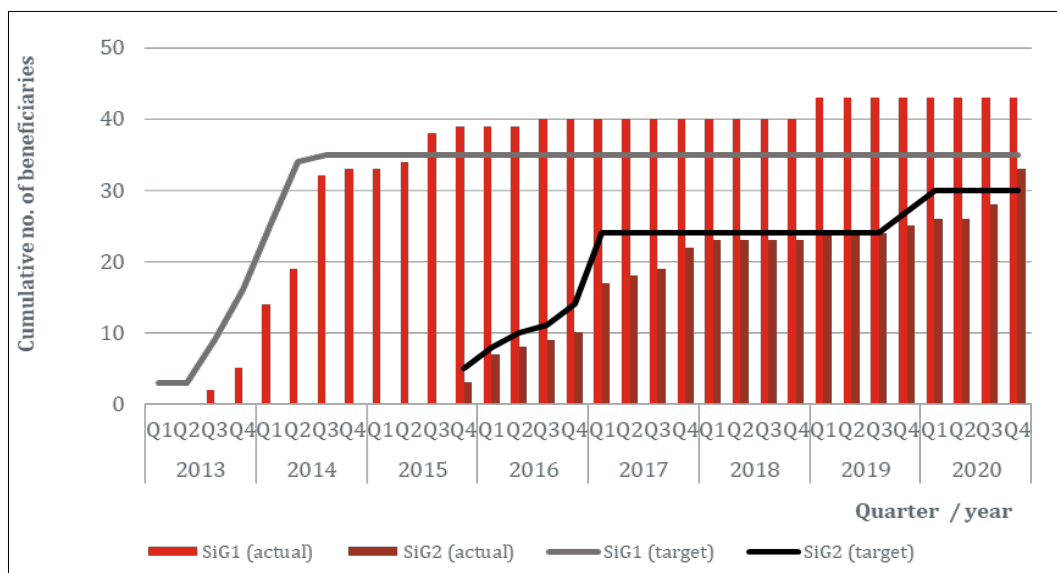
Source: SQW based on SiG monitoring data



## Firms engaged and training received

4.6 By the end of 2020, **SiG had entered into an agreement with 76 businesses** – that is 11 more than required as per the RGF contracts.<sup>29</sup> Of these, 43 were part of SiG1 and 33 of SiG2 (see Figure 4-3).

**Figure 4-3: Number of beneficiaries entered into an agreement with, 2013-2020**



Source: SQW based on SiG monitoring data; Slight fluctuation in figures is due to some beneficiaries leaving the programme early and therefore being excluded from cumulative figures in the following periods.

4.7 Of those 76 beneficiaries (see Table 4-1), 41 businesses were active on the programme and 15 had completed the full programme. A further 20 firms had completed early (including those who opted to complete on their own or leave the programme part way through) and 25 were unsuccessful at the application stage.

**Table 4-1: Status of companies as at December 2020**

Status	Number of firms
<b>Beneficiaries</b>	
Active beneficiaries	41
Fully approved to the programme	33
At diagnostic / due diligence stage	8
Beneficiaries completed full programme	15
Early completers (including programme leavers)	20
<b>Non-beneficiaries</b>	
Unsuccessful applications	25

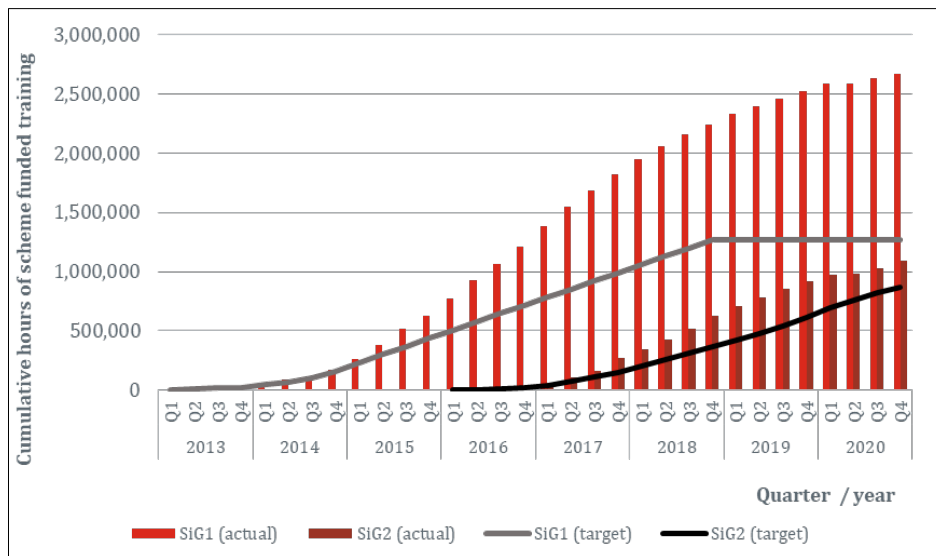
Source: SiG monitoring data

<sup>29</sup> Targets for the evaluation period and contract end are the same.



4.8 According to monitoring data, the 76 beneficiaries supported to date have received **3.8 million hours of scheme funded training** (2.7 million in SiG1 and 1.1 million in SiG2), which equates to an average of 50,000 hours per beneficiary firm (see Figure 4-4). This exceeds the original RGF targets substantially – by 76% if looking at the target up to Q4 2020 and by 67% when compared to the end of contract target for the whole programme<sup>30</sup>.

**Figure 4-4: Hours of scheme funded training received by beneficiaries, 2013-2020**



Source: SQW based on SiG monitoring data

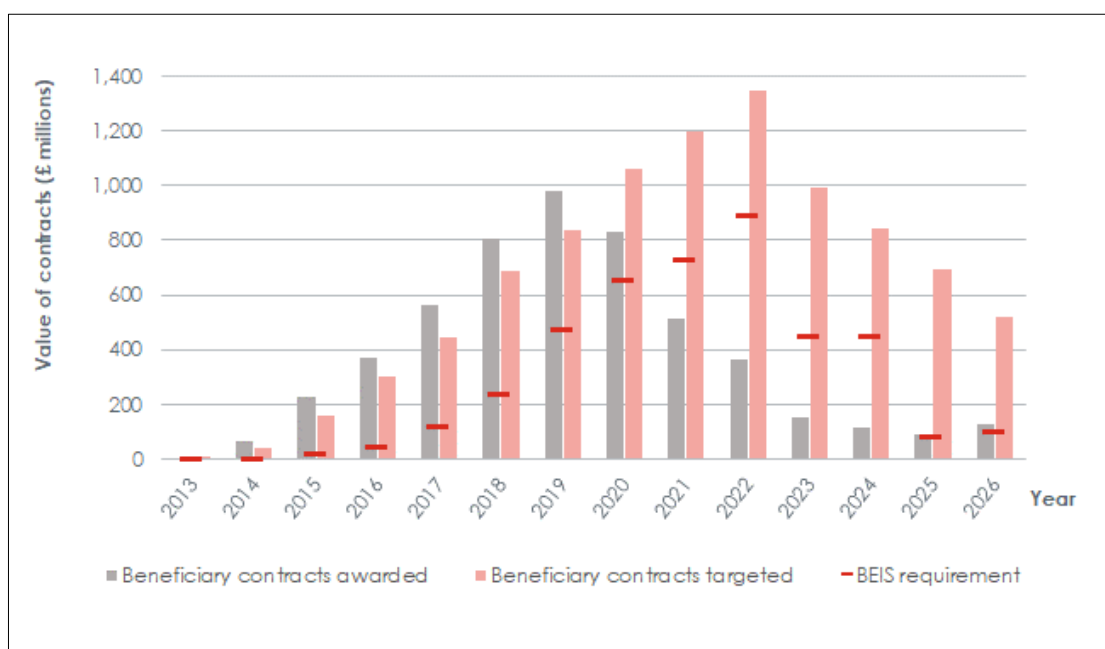
4.9 In the survey we explored how intensive SiG support was, and whether this changed over time. The majority of beneficiaries surveyed reported that engagement with SiG throughout the programme was often daily (24 out of 33 responses), reflecting the intensity and embeddedness which are central to the programme’s delivery model. For the majority of firms, the frequency of contact with SiG changed over time with almost half reporting that the level of engagement decreased (14/33) and a further third stating that it fluctuated during the programme but with no clear pattern (9/33). There were two key reasons cited for these fluctuations: the support adapting to need (e.g. decreasing as the firm becomes more self-sufficient); and the effect of the Covid-19 pandemic on site visits and other face-to-face activities.

<sup>30</sup> Average of 50,000 hours per beneficiary firm is a substantial commitment. SiG should consider capturing relevant baseline data that would help to put this into context. For example, by comparing SiG hours with the total hours committed to training prior to SiG by the beneficiary businesses.

## Value of contracts won and retained

- 4.10 Beneficiaries are required to report on the number of ‘Qualifying Supply Contracts’<sup>31</sup> which they believe SiG has helped to win or retain. This represents the gross value of contracts, i.e. not taking into account additionality.
- 4.11 By Q4 2020, the beneficiaries had reported **contracts won or retained worth £5.2 billion** which will be delivered by Q4 2026. The total figure **exceeds the BEIS overall target** of £4.2 billion for the whole programme by 23%. Figure 4-5 plots the value of contracts won or retained by Q4 2020 against the calendar year in which those contracts have been/will be delivered up to 2026<sup>32</sup>. When looking only at the contracts that had been reported and delivered by Q4 2020 (£3.8 billion), this figure was 2.5 times higher than the BEIS target for this period.

**Figure 4-5: Value of contracts won or retained, 2013-2026**



Source: SQW based on SiG monitoring data

- 4.12 Figure 4-6 plots the total value of contracts won/retained by each beneficiary firm by the end of December 2020 in ascending order<sup>33</sup>. The aggregated monitoring data suggests a median of £29 million in contracts won/retained per firm attributed to SiG (or £54m if we exclude those not recording any contracts to date). However, we can see below

<sup>31</sup> A ‘Qualifying Supply Contract’ is defined by SiG as any supply contract between a Beneficiary and an independent third party disclosed by a beneficiary to SiG, in respect of which the relevant beneficiary has confirmed to SiG through auditable evidence that it believes that the provision of SiG contributed to its ability to win or renew a contract.

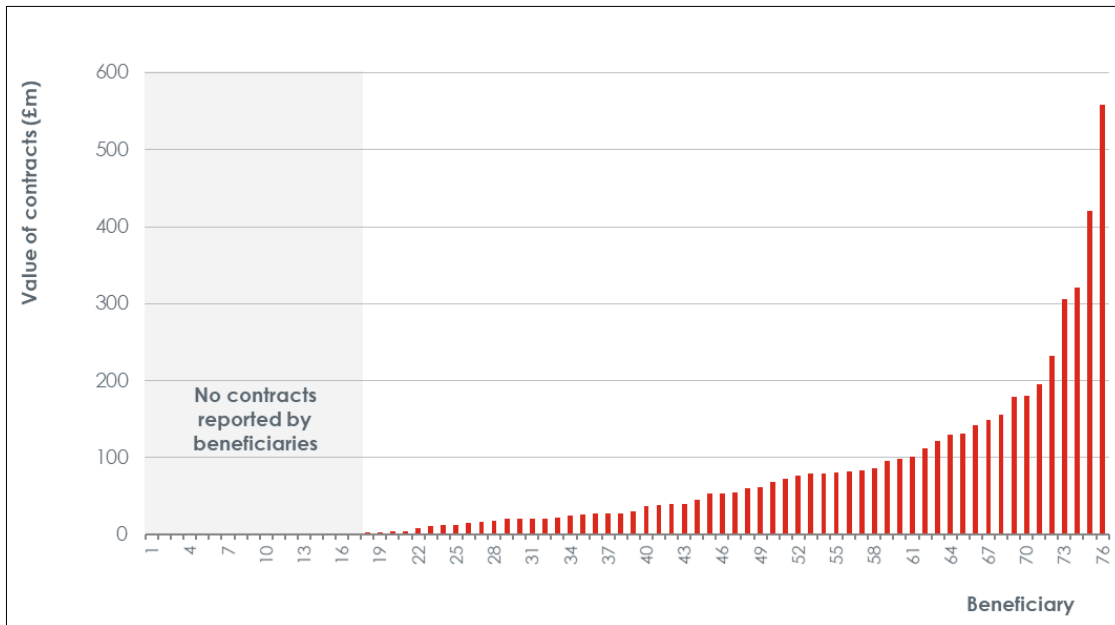
<sup>32</sup> ‘Contracts awarded’ refers to the actual contracts secured by beneficiaries as a result of SiG; ‘Contracts targeted’ refers to the forecast of contracts beneficiaries believe they will secure as a result of SiG (submitted to SiG when beneficiary is fully approved for the programme); ‘BEIS requirement’ refers to the year-by-year contractual KPI for contracts secured in SiG’s RGF contracts with BEIS.

<sup>33</sup> Also, Figure D-2 (in Annex D) presents the survey sample against the distribution of the population for new/retained contracts by value.

there is **substantial variation in the scale of contracts won/retained across those participating in the programme**. The data also shows that:

- 60 out of 76 beneficiaries (79%) have attributed contracts won/retained to SiG, but 16 have not yet observed an impact (21%)<sup>34</sup>
- 16 of the 76 firms supported have not yet attributed any contracts won/retained to SiG, the majority of whom (12) have recently started or been on the programme for less than two years; whereas all but one of the 60 firms attributing contracts to SiG have been on the programme for two years or more, demonstrating the time lag to impact
- Whilst there are some '**big wins**', with contracts won/retained in excess of £200m by December 2020, there is a **long tail** of beneficiaries for whom the value of contracts won/retained is comparatively small<sup>35</sup> (80% of the total value of contracts won/retained and attributed to SiG are accounted for by 32% of all firms supported by the programme).

**Figure 4-6: Distribution of new/retained contracts by value**



Source: SQW based on SiG monitoring data

## Number of job years created and safeguarded

4.13 Based on the value of contracts won or retained, SiG estimates the gross employment effect attributable to the programme. Job years are calculated by SiG using contract value, which is converted to the value of goods sold in a year to estimate the number of jobs created or safeguarded to support this value of goods in a given year of contract

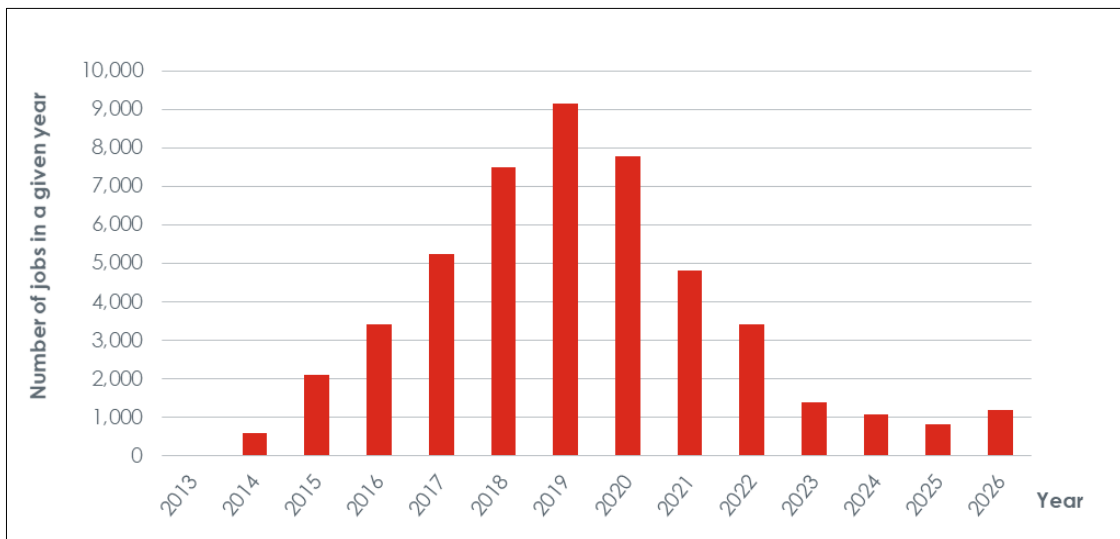
<sup>34</sup> Every beneficiary grant is awarded on the basis of an Investment Proposal which defines each firm's individual targeted contract won and retained, based on the firm's expectations, amongst other things. By Q4 2020, the actual declarations of contracts won and retained were 9% ahead of what was declared in their firm's Investment Proposals.

<sup>35</sup> Such a distribution is not uncommon for business support programmes.

delivery. Over the duration of the contract, the approach and conversion factor used to calculate the employment effect has evolved, in agreement with BEIS. The most recently agreed approach is to apply a ‘single blended ratio’ of £107,087<sup>36</sup> to the cumulative value of contracts won/retained across SiG 1 and SiG 2. This gives a total estimate of direct (at the beneficiary business) and indirect job years (in one level of the beneficiary’s supply chain) that were created or safeguarded as a result of the contracts won or retained.

4.14 By Q4 2020, a total of **48,519 direct and indirect job years had been created or safeguarded** as a result of SiG – exceeding the BEIS targets of 14,334 by Q4 2020 and 39,548 by the end of the contract. The employment peaked in 2019 at just over 9,000 jobs. Figure 4-7 plots the distribution of these job years between 2013 and 2026, reflecting the distribution of contract delivery shown in Figure 4-5.

**Figure 4-7: Employment effect estimated through the number of jobs required to support the value of goods sold in a year (converted using contract value), 2013-2026**



Source: SQW based on SiG monitoring data

4.15 The jobs that have been created or safeguarded as a result of SiG are disbursed across the UK (see Figure 4-8). The majority (89%) of these jobs are based outside London and the South East, reflecting the location of many major aerospace firms and suppliers. Around one in five jobs are based in the North West (20%) and East Midlands (19%); one in six in Northern Ireland (17%); and around one in ten in West Midlands (10%) and the South West (9%).

4.16 The programme has created/safeguarded employment in deprived parts of the UK, in line with RGF objectives. For example, according to monitoring data 75% of job years

<sup>36</sup> Note that this figure is used in the SiG monitoring data which the analysis in this section is based on. However, this is slightly different from the ratio of £107,102 cited in the SiG2 RGF contract.

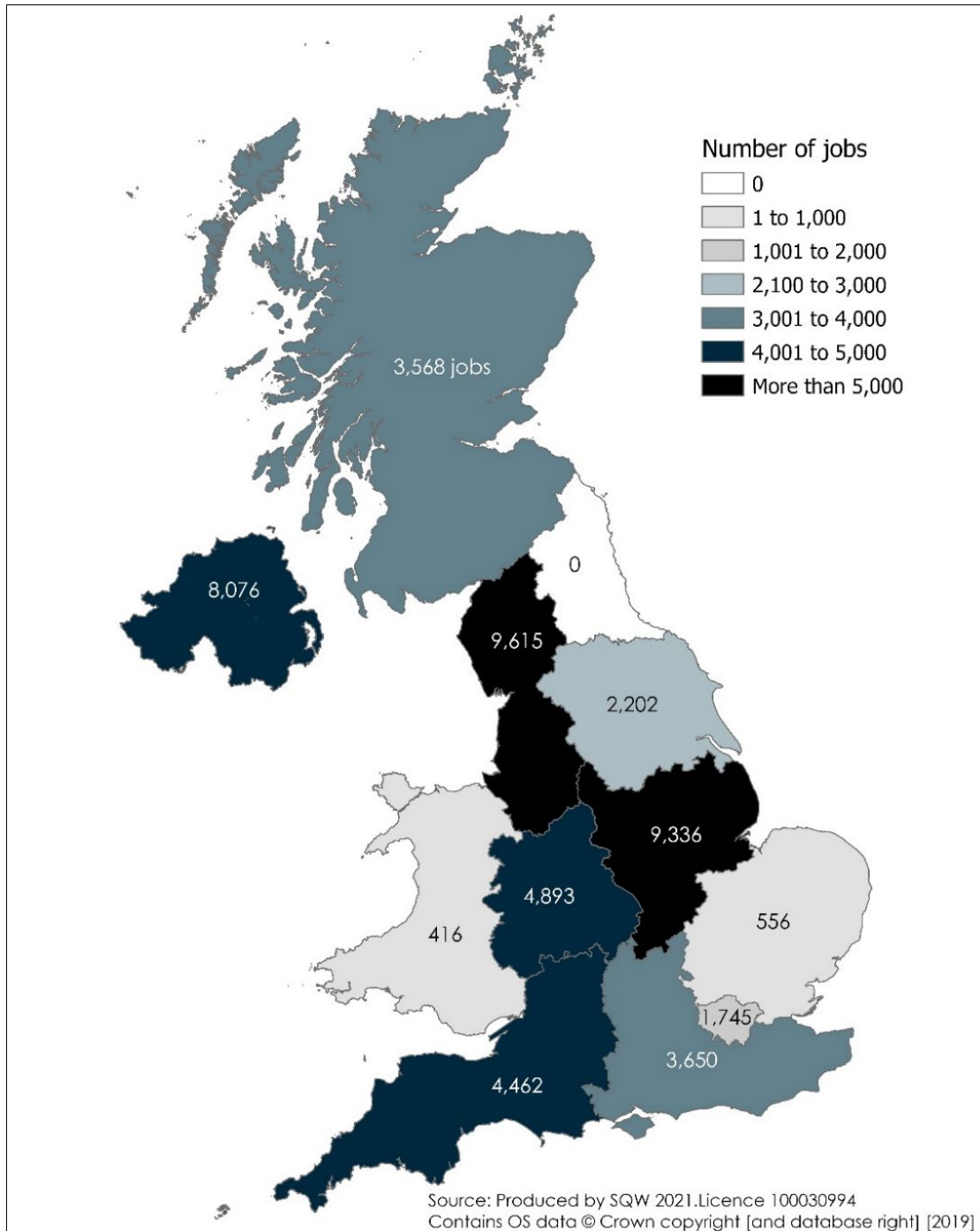
created/safeguarded due to SiG are in England, and just over one quarter of these jobs (27%) are at firms located in England's 20% most deprived local authorities<sup>37, 38</sup>.

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<sup>37</sup> Monitoring data on the postcode of firms supported has been mapped against ONS' 2019 Index of Multiple Deprivation at Local Authority level.

<sup>38</sup> Index of Multiple Deprivation (IMD) is produced in each UK nation separately. In Devolved Nations, IMD data is only produced at small geographical levels (e.g. Super Output Areas, SOA). Monitoring data is available on the postcode of firms supported, but not the location of staff employed in the jobs created/safeguarded. Given the small spatial footprint of SOAs, it is unlikely that many staff reside in the same SOA as the firm is based. To avoid misrepresentation, we have therefore not compared firm location/job impacts to deprivation at very small geographical levels in Scotland, Northern Ireland or Wales. However, in England, IMD data is available at Local Authority level, where it is more plausible to assume that a reasonable proportion of staff live in the same Local Authority as the supported firm. Hence data for England only is presented above.

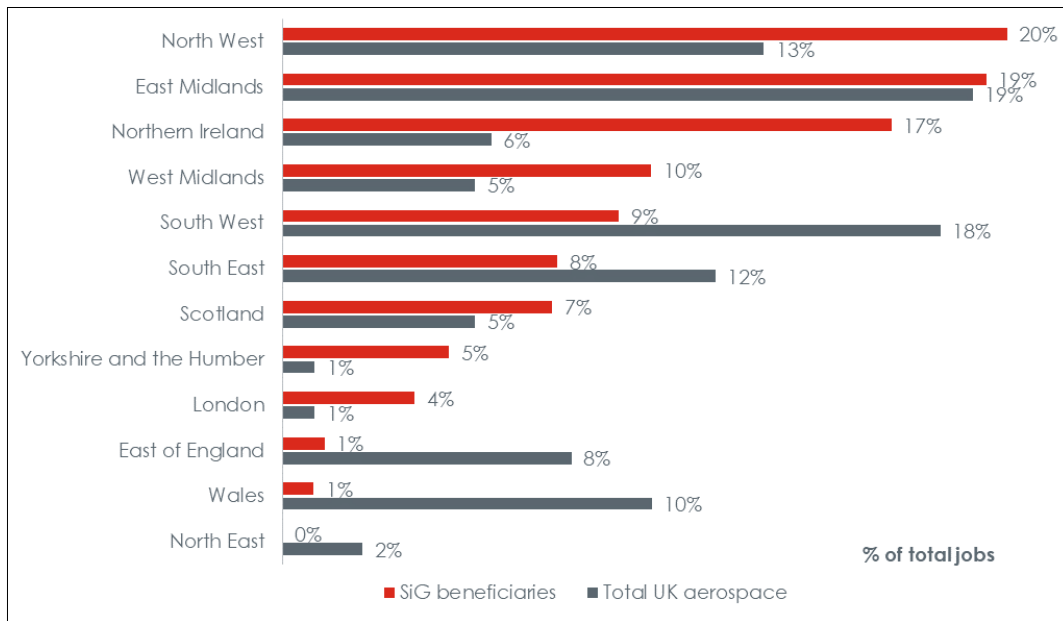
**Figure 4-8: Distribution of jobs created or safeguarded by region**



Source: SQW based on SiG monitoring data

4.17 Figure 4-9 compares the distribution of all aerospace jobs across the UK with the jobs created or safeguarded by SiG beneficiaries. The results are quite mixed with some areas over-represented by SiG (North West, East Midlands, West Midlands and Northern Ireland) and others under-represented (e.g. South West, South East, East of England and Wales). Not surprisingly, this reflects the location of beneficiaries.

**Figure 4-9: Regional distribution of jobs created or safeguarded vs UK aerospace**



Source: SiG jobs from the programme monitoring data; UK total jobs from ADS Industry Facts & Figures 2020

## Interaction with other support

4.18 As discussed in Section 2, SiG was intended to complement other business support programmes aimed at the aerospace industry. Below we have set out evidence on SiG’s engagement with the wider support landscape in practice, from both stakeholder interviews and the beneficiary survey.

### Stakeholder perspectives

4.19 **Stakeholders perceived SiG as sitting at the top of a “ladder of progression”** starting with SC21 Lite, SC21 OE, and then SC21 C&G. The majority of consultees perceived SiG’s offer to be distinctive among public support programmes – it is intensive, long-term, holistic, co-ordinated support delivered by a team with sector-specific expertise and strong leadership. Whilst efforts were made during the early implementation of SiG to harmonise the SiG diagnostic with SC21 OE to demonstrate how companies can progress from one to the other, some consultees still perceived an overlap with the SC21 programmes. Differentiation between SiG and OEM/prime support was clearer amongst those consulted, with the latter perceived as less hands-on and may lead to dependence on a single customer. That said, two consultees perceived SiG as a supplier improvement programme for Rolls Royce (with implications for buy-in/engagement with other primes).

4.20 **There was limited awareness of how effectively this “ladder” operates in practice** in terms of integration with the wider support system. Some stakeholders were concerned that support is difficult to navigate for SMEs and the pathway post-SiG is not clear, and so opportunities may exist for the support landscape to be better joined up.



The need to more effectively integrate support should be both the responsibility of SiG and other programmes (including those introduced after SiG commenced).

- 4.21 **There was mixed feedback on how effectively SiG has engaged with external organisations and programmes.** Whilst five stakeholders considered that SiG could improve this engagement (including by making better use of third parties to share knowledge more widely, and communicating tangible impact to OEMs and sector bodies), four thought SiG was well engaged and well known in the landscape.

### Beneficiary perspectives

- 4.22 **There were mixed experiences when it came to accessing other public support prior to or alongside SiG.** Of the 33 beneficiaries surveyed, 13 firms had received other public sector support in the year prior to engaging with SiG and 11 had done so during SiG support (Table 4-2). Only one had engaged with other public support after SiG support ended, but this reflected the fact that most of those surveyed were still actively participating in SiG.

**Table 4-2: Has your business received any other public sector support in the year before engaging with SiG / at the same time as SiG / after SiG support ended?**

	Accessed other public support before SiG (N=33)	Accessed other public support during SiG (N=33)	Accessed other public support after SiG (N=7)
Yes	13	11	1
No	17	21	6
Don't know	3	1	0

Source: SQW survey of SiG beneficiaries

- 4.23 There was limited experience of accessing other aerospace support programmes (e.g. SC21, NATEP, ATI and NMCL) either before (5 firms), during (1 firm) or after SiG (1 firm), suggesting that in practice **the ladder of support targeting the sector – including SiG as part of that offer – is not particularly well integrated. However, the majority of firms had accessed ‘other’ public support programmes before (11 firms) or during (10 firms) SiG – many of which provided R&D support**, and did not have a specific aerospace focus. Of these, funding from Innovate UK (including Knowledge Transfer Partnerships) was most commonly cited.

- 4.24 SiG was seen by those consulted as very distinctive compared to other support provision, particularly in terms of: the **intensity and embedded nature of support** provided by SiG (8/22) and the fact that SiG is a **distinct transformation programme** with a **rounded approach** providing recommendations as well as assisting with the implementation of changes (9/22). Additionally, one respondent noted that SiG is **tailored to the aerospace sector**, making it unique when compared to other more generic support programmes. Lessons learned around the extent to which these characteristics have shaped and influenced outcomes are discussed further in Section 9.

*"It is a totally different thing. SiG is very embedded – they operate as part of the company and they are part of the team."*

Survey respondent

## 5. Direct outcomes

### Key messages

There is consistent and positive evidence to show how SiG has led to improvements in workforce skills/knowledge (managerial and technical) and capabilities, and strengthened business strategy. The majority of firms targeted by SiG reported low capabilities at the outset, and have demonstrated progress since engaging with the programme. SiG has also changed business culture, with improved leadership and management behaviours combined with better workforce engagement: both have been important in enabling change.

There is strong evidence to suggest SiG has changed attitudes and behaviours towards the value of investment in training, in line with the original rationale, and some beneficiaries are now more willing to pay for private sector support.

The majority of beneficiaries surveyed have introduced new processes and practices, improving their operational competitiveness and productivity, and reducing costs. This has led to new/retained contracts, including new clients from overseas and non-aerospace clients. The benefits above are translating into jobs created/retained within the beneficiary firms as a result of SiG support. There is no evidence to suggest a trade-off between jobs and productivity improvements.

SiG does not appear to have a significant impact on the development of new products/services – nor was it expected to by those consulted.

SiG has also led to unexpected consequences in a minority of cases: on the downside, short term capacity issues and impacts on business performance during the initial, most intensive phase of engagement and change within the business; and on the upside, put business in a stronger position to be agile and pivot in response to the challenges faced by Covid-19.

5.1 In this Section, we present evidence on the direct outcomes generated by SiG to date, testing the extent to which intended outcomes set out in SiG's logic model have been realised in practice. This includes improvements in skills and competencies, leadership behaviours, business strategy and operational competitiveness, as well as new/retained contracts and jobs within beneficiary firms. The discussion below expands on the contractually-based KPI monitoring data, provided by SiG and presented in Section 4, to explore how these outcomes have been realised. The evidence presented below draws on the following:

- A telephone survey with 33 SiG beneficiaries, which represented 44% of beneficiaries still trading at the time of fieldwork in Autumn 2020 (75 in total) and 100% of beneficiaries who opted into the survey. As noted in Section 1, survey population was broadly similar to the wider beneficiary population in terms of size (measured by FTE

staff and turnover) and the spread of dates over which they started the programme. Whilst the findings from the survey are consistently positive, given the relatively small size of the sample in absolute terms, there is inevitably a margin of error which should be taken into account when interpreting the results below. (see Annex D for further details)

- Detailed case studies with eight beneficiary firms
- Consultation evidence from qualitative interviews with SiG central staff and delivery partners, BEIS and external stakeholders.

## Direct outcomes observed to date

- 5.2 On the whole, there is consistently positive evidence of the impact of SiG on businesses involved across the beneficiaries, stakeholders and delivery partners consulted for the evaluation. Compared to intended outcomes set out in the SiG logic model, there is particularly strong evidence of benefits in terms of improved skills/knowledge, capabilities and management practices, alongside improved operational practices and processes. Together, these benefits were leading to cost reductions and efficiencies, improved quality and competitiveness, which had enabled firms to retain and win new contracts. That said, evidence of SiG enabling firms to develop new or improved products, innovate or re-base manufacturing in the UK was weaker.

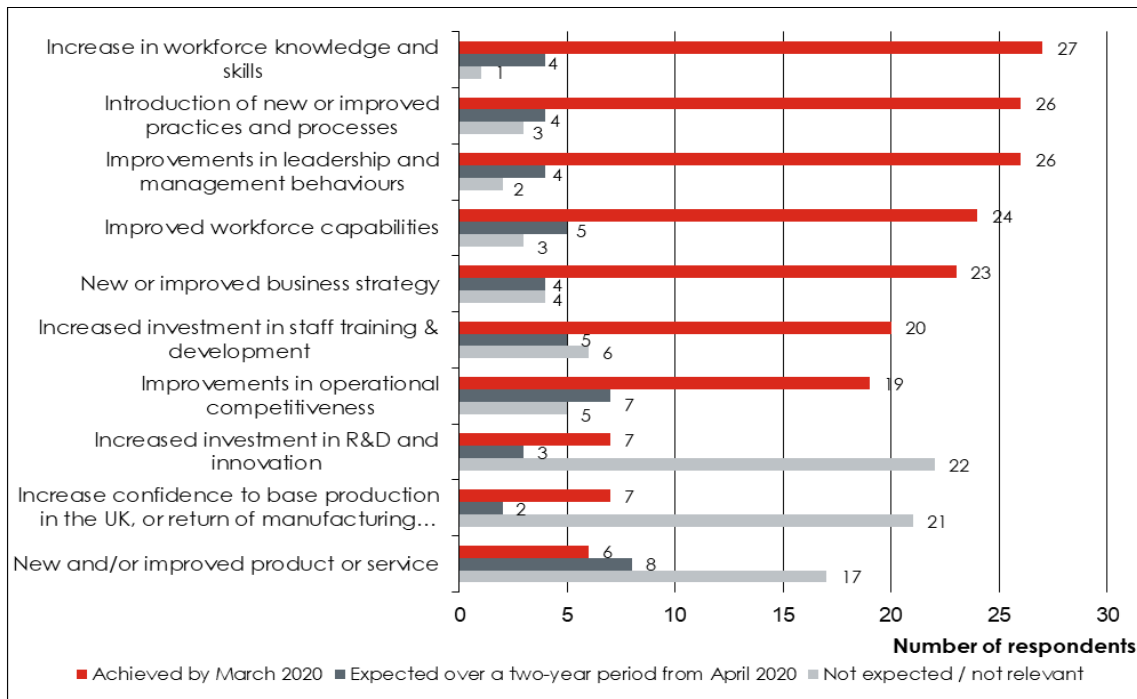
*"feedback I've had from businesses involved has been resoundingly positive"*

Stakeholder consultee

## Intermediate outcomes

- 5.3 According to the beneficiary survey, the large majority of respondents had observed an **increase in workforce knowledge and skills** (27 out of 33 respondents, 82%), introduced **new or improved processes/practices** (26 out of 33, 79%) and **improved leadership and management behaviours** (26 out of 33, 79%), as illustrated below. Improved workforce **capabilities**, new/improved **business strategy**, increased **investment in staff training** and development, and improved **operational competitiveness** had also been experienced by over half of those consulted. To put this into context, most survey respondents had been on the SiG programme for multiple years, and for the majority, support was ongoing at the time of interview. Few respondents (6 out of 33) felt SiG had enabled new and/or improved products or services, and on the whole, SiG was not expected to play a role in R&D/innovation or retaining/reshoring their firm's production in the UK for the majority of respondents.
- 5.4 For the five respondents who stopped participation in SiG early, the extent to which they experienced intermediate outcomes appears to be quite polarized: two reported few outcomes, whereas two achieved a broad range of outcomes.

**Figure 5-1: Beneficiary survey results: intermediate outcomes generated by SiG**



Source: SQW analysis of beneficiary survey 2020, n=33

5.5 In the paragraphs that follow, we explore these outcomes in more detail.

### Improved knowledge, skills, capabilities and behaviours

5.6 There appears to be a substantive qualitative impact on the leadership and wider workforce within participating firms, particularly in terms of **attitudes, behaviours and cultures**.

5.7 SiG intentionally targets support at the senior leadership level – and therefore, as we might expect, **management and leadership skills** were most frequently cited as an area of skills improvement amongst those surveyed (20 respondents, 61%). Five of the case studies also emphasised the role of SiG in changing leadership attitudes and behaviours, particularly in terms of developing a clear vision/values and objectives for the firm, the style of leadership, and their approach to workforce management and communication. This was corroborated by feedback from the SiG team, which has found that leadership support has been a critical catalyst for all other outcomes. Feedback from delivery partners and external stakeholders also supported this finding, for example, in arguing that leadership teams were able to develop more “meaningful strategic plans” as a result of SiG.

#### Case study example (2)

For this firm, weekly meetings initiated by SiG were a key factor in getting different, previously siloed parts of the business to cooperate and discuss common objectives. SiG’s management and training workshops were also very effective in changing the

attitude and behaviours of leaders in the business, which had a knock-on effect throughout the company, resulting in a more constructive workplace atmosphere.

#### **Case study example (4)**

In the case of this business, SiG initially focused on support to the firm's leadership, which included sessions delivered by the SiG team, as well as external training sessions focused on self-awareness and communicating with impact. The training then "cascaded down the organisation" to team leaders, where the focus was on style of leadership and employee engagement. The targeted leadership training at the start of the programme helped develop the understanding of the need for change and – as the benefits of operational changes became tangible – there was a notable shift away from the "traditional manufacturing mindset" towards a high performing, ambitious and modern culture where mindful risk taking and striving to go "above and beyond" became the norm.

- 5.8 There is also strong evidence in both the survey and case studies to suggest that these **benefits are filtering through to the wider workforce**. For example, beneficiaries noted that improved management skills and communication, alongside workforce engagement in the SiG process, had resulted in **better workforce engagement, greater confidence and a positive cultural shift** across the business as a whole. This was corroborated in the case studies, where consultees described how the wider workforce had been engaged in developing a clear vision/ set of values for the firm, the process of analysing performance, and in developing and testing proposed solutions. It has taken time for some beneficiaries to change and embed new cultures, and the "sustain" aspect of SiG has been particularly helpful in that respect. However, there is a common message that this cultural shift has been absolutely critical in securing workforce openness and buy-in to change, empowering staff with the confidence and ownership to instigate and implement change, and ensuring that changes are sustained over the longer term. Moreover, as illustrated in two case studies below, it has subsequently encouraged staff to become more accountable for their own decisions and proactively solve problems themselves.
- 5.9 These findings were corroborated in interviews with delivery partners and wider stakeholders, who argued that SiG has led to more engaged and confident workforces. One delivery partner also argued that, by strengthening business resilience and engaging the workforce more effectively, the programme has helped to improve the mental well-being of employees within the beneficiary companies.

#### **Case study example (6)**

Support from SiG to define company values and introduce visual management on the shop floor, alongside including staff in the process of analysing performance and identifying solutions (e.g. through 'root cause and corrective action' training) has led to improved employee engagement and empowered staff at all levels to implement solutions to identified problems. Increased employee engagement and empowerment meant that

shopfloor staff became more open to adopting changes suggested by SiG and the firm's management, and have also begun to proactively solve problems. Whilst SiG targets the senior leadership team, the consultee felt that the way in which SiG engages wider staff was important in delivering sustained outcomes. This has also improved the culture of the firm, which the consultee argued was important in providing the necessary platform for growth in future. Moreover, because the new process and improved culture introduced by SiG are now embedded, the benefits are expected to persist after SiG support ends in summer 2021.

#### **Case study example (8)**

SiG's management training focused on developing a clear focus and strategy for the business, how the management team interacted with the rest of the staff, and whether it had a balanced and effective team able to implement changes. Complementary employee engagement and training provided the opportunity for staff to feed into what future SiG support should focus on, and the Team Leader Academy training enhanced the confidence and skills of individuals who took part to ask questions and implement business changes. The firm recognised that cultural change takes a long time embed within a business, and but now expects SiG's support to lead to further benefits in the future.

- 5.10 SiG is also leading to **improved practical/technical skills**. For example, eight survey respondents had improved their financial management skills (such forecasting and setting effective KPIs) and a further 11 respondents said that that technical skills had improved. Five out of eight delivery partners consultees highlighted improvements in knowledge and skills relating to communication, technical expertise, HR processes, bid writing and finance. The case study examples provide further detail on how these outcomes have been achieved through SiG, predominantly via a combination of internal and external training.

#### **Case study example (5)**

SiG introduced this firm to an NVQ programme, which led to the majority of the workforce undergoing some form of training, leading to increased knowledge and skills. Training of this scale – encompassing all parts of the business – would not have been considered without SiG. Also, whilst the firm had an apprenticeship scheme prior to SiG, business growth resulting from SiG support meant that the firm could expand its own apprenticeship scheme.

- 5.11 The evidence found most firms improved their capabilities in business processes as a result of SiG. The Capability Maturity Model (CMM) has been used to measure progress in this regard, which provides five levels of 'maturity' of processes and practices. This covers progression from ad hoc business practices, to formally defined steps, managed result metrics, and active optimisation of processes. The CMM is an internationally recognised approach to consistently assessing businesses' processes



and their ability to engage in continuous improvement. Figure 5-2<sup>39</sup> shows beneficiaries' views on their firms' capability level when they first engaged with SiG and at the time of interview in Autumn 2020. We can see that, at the time of first engagement with SiG, most beneficiaries (23 out of 32) thought their capabilities/processes were at Level 1 (i.e. processes are informal and ad hoc) or Level 2 (i.e. processes are basic but repeatable), which supports the original need for intervention and suggests SiG was broadly targeted appropriately. This also aligns with feedback from our consultation with SiG staff, who initially found firms far less mature than expected when the programme began, and therefore had to adapt their offer in response. The survey evidence also illustrates progress made across the large majority of firms supported. By Autumn 2020:

- All businesses (who were able to comment) have made progress in maturing capabilities
- Nearly half of respondents (16) have progressed two or more levels since engaging with SiG. Of these, six respondents have progressed three or four levels.
- Over half of respondents (18) considered their business to be at Level 4 (i.e. processes are quantitatively measured and controlled) or above, compared to only 1 respondent at this level prior to SiG.

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<sup>39</sup> Respondents were asked to provide an average CCM level; however, it is recognised different processes with a firm may be at different levels of maturity/influenced more than others by SiG. This was explored further in case studies.

**Figure 5-2: Beneficiary progression through the Capability Maturity Model between first engagement with SiG (A, start year) and time of interview (B, Autumn 2020)**

Year of starting SiG	Capability Maturity Model Level					Don't know
	Level 1 - Initial: Processes exist but are informal, ad hoc, and not properly characterised	Level 2 - Repeatable: Basic processes established, processes are repeatable	Level 3 - Defined: Processes are well defined and standardised	Level 4 - Managed: Process quantitatively measured and controlled	Level 5 - Optimising: Focus on process improvements	
2020		A				B
			A	→	B	
2019	A	→	B			
		A	→	B		
2018		A	→	B		AB
						AB
2017					AB	
	A	→	B			
	A	→	B			
	A	→	B			
	A	→	B			
2016		A	→	B		
		A	→	B		
	A	→	B			
2015	A	→	B			
		A	→	B		
			A	→	B	
2014			A	→	B	
		A	→	B		
		A	→	B		
	A	→	B			
		AB				
	A	→	B			
	A	→	B			
	A	→	B			
2013			A	→	B	
						AB
	A	→	B			

Source: SQW analysis of beneficiary survey 2020, n=33

## Increased investment in training and development

- 5.12 SiG appears to be having a demonstration effect, leading to **changes in attitudes and behaviours towards investment in training amongst beneficiary firms**. In the survey, nearly two thirds of beneficiaries (19 out of 30, 63%) reported they were more likely to invest internal funds in management/leadership training in future as a result of their experience of SiG, and some (6) had already invested more in training as a result of SiG. Furthermore, of the survey respondents who have already or are more likely to invest in similar training in future (23), around half (12) reported that they would also be **more likely to pay for support from the private sector** as a result of their SiG experience. As illustrated in the adjacent quote, one respondent justified this by saying they are more able to judge the quality of offer available. The SiG team has also observed initial steps towards direct payment, with two SiG ‘graduates’ looking to sign up to SiG’s new alumni programme. This offers private, tailored support via an annual membership and agreed ‘statement of work’.
- 5.13 These findings were supported by the case studies, where SiG had influenced/strengthened attitudes towards investment in training in six (out of eight) firms consulted by demonstrating the value in staff development. The case studies also highlight SiG’s **influence on the nature of training that firms are now willing to invest in, with a shift from primarily technical/operative training to greater investment in leadership and management**. Five of the eight delivery partners consulted also thought there would be an increased appetite for private support due to SiG beneficiaries experiencing the benefits that such support can bring.
- 5.14 These findings suggest SiG is, to some degree, helping to address the original rationale for the intervention, particularly in terms of underinvestment and information failures. That said, there were also seven examples in the survey where SiG had made no difference to their planned investment in training. For some, because SiG had such a substantial impact on culture and behaviour, there was a sense that external support was no longer required. However, more detailed case study evidence and SiG and delivery partner feedback suggested that **affordability remains a major barrier**, particularly given the impact of Covid-19 on ‘discretionary spend’. Also, particularly for those who have not participated in SiG, there are ongoing difficulties in making the **case for investment in people** (i.e. intangibles) rather than capital, and securing growth finance on this basis.

*“[I am] much more open minded to the potential benefits of this type of support.”*

*“We are more likely to pay for it but much more driven into checking the quality of the training because we know what good looks like”.*

*“We have seen the benefit that we get from these sorts of activities. SiG are running an alumni scheme – we are definitely considering that”*

Survey respondents

### Case study example (7)

SiG influenced the firm's attitude towards investment in training. The quality of the staff brought in by SiG made the firm's management board realise how efficient the company could be with the right people. The firm now aspires to have the "very best" employees, which cannot be achieved through recruitment alone. Hence, the company now invests more heavily in its own team as a result of the SiG programme.

### Case study example (8)

Prior to SiG, the firm had consistently invested in its workforce, including through internal training, apprenticeships and supporting individuals to attend university. Nonetheless, the consultee noted that SiG has further highlighted the importance of investing in the workforce: "we have seen from SiG that if you invest in the people and put trust in the team that pays the dividend". The firm is now more likely to invest internal funds in training as a result of the SiG experience, and will also continue to run the employee engagement exercises introduced by SiG beyond the programme.

## New practices and processes

- 5.15 As illustrated in Figure 5-1, the majority of survey respondents (26 out of 33, 79%) had already introduced new/improved practices and processes as a result of SiG support. These changes included:
- **Management practices:** the introduction of improved business reporting and KPIs (and how employees engage with these), financial planning and communication (e.g. new daily briefings), new HR processes (e.g. recruitment), improved production data gathering/analysis processes, and improved customer engagement practices
  - **Operational practices:** value stream mapping and lean practices, the introduction of new assembly layouts, improved waste management practices, and new product introduction processes.
- 5.16 It is encouraging to see that **SiG is enabling firms to actually implement change** - not just identifying what needs to change and developing the skills to change - particularly given most survey respondents were still on the programme at the time of interview and all will have faced challenges and competing priorities during the pandemic. Very few survey respondents had completed the SiG programme, so it is too early to fully assess whether new practices/processes had been sustained after support had ended. That said, of the five firms surveyed that had introduced changes and completed the programme, four had continued to implement new practices/processes after support had ended.
- 5.17 These findings were corroborated by case studies (see examples below), and the delivery partners and external stakeholders consulted who had observed improvements to marketing, leaner production cycles, and the adoption of process innovation and good practice more generally.

### **Case study example (1)**

Improving the Enterprise Resource Planning (ERP) system through SiG's support provided the firm with more reliable information with which to make better informed decisions about the productivity of specific manufacturing lines. SiG therefore enhanced the firm's ability to gather data in order to make informed decisions which could lead to long-term productivity outcomes.

### **Case study example (4)**

The first outcome for the business was operational improvement. This was enabled by the implementation of Lean techniques and, relatedly, more effective management and leadership practices e.g. visual management, introduced by the SiG team and external providers. It was relatively straightforward to achieve tangible "quick wins" in this area through dedicated, timebound activities focussed on specific areas in the business.

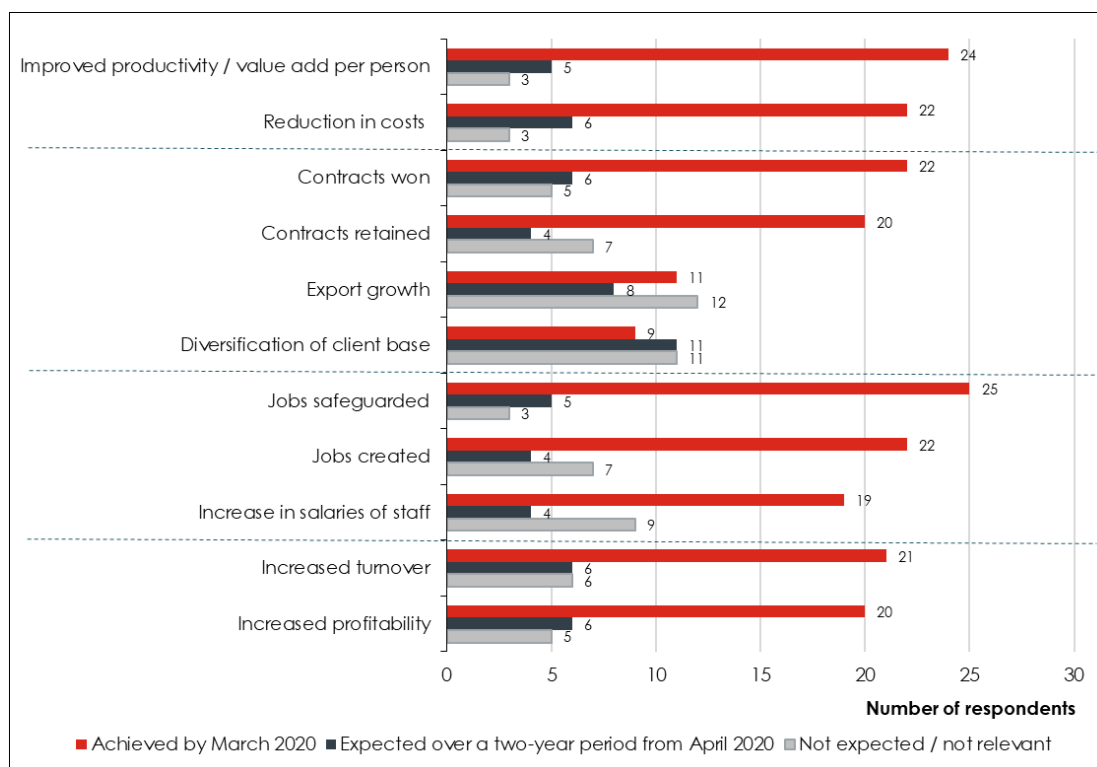
## **Investment in R&D, and new products/services to market**

- 5.18 SiG appears to have greater impact on introducing innovative processes or improving the process of product development, rather than encouraging investment in R&D or helping firms to develop and commercialise new products/services. This was demonstrated in both the beneficiary survey, where only seven respondents (out of 33) had increased investment in R&D and five had introduced new products/services as a result of SiG. This aligns with feedback from external stakeholders, where there was no consensus on whether SiG has – or was intended to – promote innovation, with an expectation that SiG stimulated process rather than product innovation. Overall, the evidence confirms that SiG was not designed to focus on introduced new products, but support training of managers and leaders,

## **Business performance outcomes**

- 5.19 The beneficiary survey also explored the extent to which SiG has led to improvements in business performance metrics, including productivity, costs, contracts, jobs, turnover and profitability. As illustrated below, a large proportion of respondents have improved productivity and reduced costs, which appears not to have been at the expense of staff or their salaries, with respondents also stating that SiG has enabled them to create and safeguard jobs respectively. Around two-thirds of respondents have won or retained contracts due to SiG, and increased turnover and profitability.
- 5.20 These business improvements are explored in more detail below.

**Figure 5-3: Beneficiary survey results: business performance outcomes generated by SiG**



Source: SQW analysis of beneficiary survey 2020, n=33

### Reduced costs, improved efficiency and productivity

5.21 Across the beneficiary feedback, there is a common and consistent narrative of how the introduction of new practices/processes described above, underpinned by skills improvements and changes in leadership behaviour and workforce engagement to effectively implement and sustain changes, is leading to improved operational performance, particularly in terms of:

- Reducing costs (22 out of 33, 67%), through improved efficiency, cost avoidance, reduced wastage, and improved supply chain management
- Improving productivity (24 out of 33, 73%)
- Reducing the variability and improving the quality of outputs.

5.22 These benefits are illustrated in two case study examples below. However, it is important to flag that the econometric analysis did not find impacts on productivity to be statistically significant (see Section 6).

#### Case study example (7)

SiG facilitated operational improvements, such as the introduction of a new pipe assembly system that was considered “ahead of its time”. Based on learning from SiG, the firm also improved its manufacturing cell layout into a system, which minimised the number of defects and so improved the quality of outputs and reduced wastage. Through these changes, the firm improved the overall efficiency of its shopfloor. The changes

made to manufacturing cells also resulted in higher turnover and profitability: for example, one cell's turnover grew from £300-400k to £2.5m during the programme.

### Case study example (2)

Using Lean techniques, SiG experts worked with the firm to reorganise parts of the shop floor, which led to the reduction in the variability of outputs. The firm also saw an improvement in their productivity (measured by the amount of scrap materials produced) as a result of the training received. This led the firm to secure at least one contract (in the automotive sector) that it could not have delivered profitably prior to SiG.

## New or retained contracts, diversification of client base, and export growth

- 5.23 According to the beneficiary survey, SiG had impacted upon contracts in 24 out of 33 respondents by March 2020 (73%), which is similar to the proportion attributing contract impacts to SiG in the monitoring data presented in Section 4 (79%). A further four survey respondents expect an impact on contracts in the two years from April 2020. **This gives a total of 28 respondents (out of 33) who have already observed or expect impacts on contracts in future due to SiG.** Of this group, 20 had retained contracts and 22 had won new contracts due to SiG. Looking forward, six firms expected to win new contracts due to SiG in the two years from April 2020, and a further four expected to retain contracts over this period. Five respondents have not experienced any impact on contracts as a result of SiG, and do not expect an impact through to April 2022.
- 5.24 The high proportion of businesses gaining new work suggests SiG is helping firms to **widen and diversify their business base**. Moreover, the survey results show approximately two-thirds of new contracts won and nearly half of contracts retained (by value, where respondents were able to quantify<sup>40</sup>) came from **overseas clients**. Whilst this is based on small numbers, it does indicate that SiG is helping to grow the UK aerospace sector, rather than solely displace activity within the UK.
- 5.25 Only 13 firms were able to quantify the value of contracts won/retained between their first involvement with SiG and March 2020: the **median value of contracts won/retained due to SiG was £21m per firm**. This is notably lower than the monitoring data in Section 4, but is drawn from a small sample and so it would not be appropriate to make a direct comparison.
- 5.26 The survey also illustrated how **SiG has enabled firms to win/retain contracts beyond the aerospace sector**. Whilst around two fifths of respondents (10 out of 24) said that all of the new/retained contracts were from aerospace clients, the remaining three-fifths (14 out of 24) had won/retained contracts from a mixture of the **aerospace and other sectors**.

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<sup>40</sup> In total 24 beneficiaries said they had won and/or retained contracts as a result of the programme, but only 13 were able to quantify how much of this was from overseas clients.



- 5.27 The case studies explore in more detail how the contract-related outcomes were brought about, and demonstrate how it is often the reduction in costs that means quotes are more competitively priced and/or contracts become more financially viable (with greater profit margins), as illustrated by the examples below. There was also one example where facility expansion enabled a firm to service additional contracts. In addition, beneficiaries and stakeholders argued that SiG support helped to strengthen participants' competitive position, including improved quality and reliability (linked to operational change, performance management practices/skills, and employee engagement), improved strategic visioning and planning (for example, by targeting or focusing on priority opportunities) and introducing more effective processes to reach new markets.

### **Case study example (1)**

As a result of SiG, the firm had retained £8.8m of aerospace contracts - three quarters of which were exports – by March 2020. The whole package of support from SiG contributed to this in a variety of ways – “each individual SiG coach was a piece of the jigsaw.” For example:

The improved company vision and strategy means the firm is focused on winning/retaining specific contracts, rather than the previous approach where the company delivered a wider range of contracts.

By making the overall business vision and performance against specific targets more visible employee engagement has improved and they are inspired to achieve company targets.

Employee engagement has also increased as a result of staff being sponsored to undertake an NVQ in Business Improvement. The investment in staff leads to them feeling more motivated and empowered which translates into better quality work.

Improved supply chain management/strategic procurement helps to reduce costs and improve operational competitiveness.

### **Case study example (6)**

Prior to SiG, the firm had experienced issues in terms of cost, product quality and timeliness of delivery, and was at risk of losing existing contracts. Support from SiG on defining the company values and introducing visual management helped to improve employee engagement, which empowered staff at all levels to implement solutions to identified problems. This contributed to improving quality and increasing on time delivery (up by 20 percentage points), which significantly reduced customer complaints (down by 90%). It also reduced wastage (scrap rate down by 50%), which meant the firm could offer a lower price. In addition to the improvements due to SiG, the firm accepted a reduced profit margin, and together, these changes meant the firm was able to retain three multi-million pound aerospace contracts. The firm also won over £5m of contracts in new markets, including nuclear and pharmaceuticals, by applying pre-existing

capabilities to produce new products for these markets. This was fully attributed to SiG because of the efficiency improvements discussed above, the additional emphasis SiG gave to existing efforts to diversify the businesses, and new product introduction process introduced by SiG. Previously new product introduction had been inefficient. The SiG support improved the robustness and speed of the product introduction process in all markets, thus helping to win new contracts.

## Jobs and salaries

- 5.28 The large majority of survey respondents (30 out of 33) have already achieved or expect to achieve an impact on jobs within their firm as a result of SiG. Most of these (26 out of 33, or 79%) have observed an impact already, with 20 creating jobs and 25 retaining jobs by March 2020. Furthermore, five respondents expected jobs to be created, and four expect jobs to be retained, in future by April 2022. Through the survey and case study research there was a clear link between a firm's improved operations, competitiveness and resilience, leading to growth/retention in contracts and the creation/retention of jobs to service those contracts. Only one survey respondent said they now have fewer employees but a growing order book, because they are more productive and can therefore produce more with fewer employees.
- 5.29 This evidence suggests that **SiG support is translating into employment benefits** and, even though a high proportion of beneficiaries have also improved productivity, for the large majority of firms there is **not a trade-off between productivity/cost reductions and jobs**. This was supported by the delivery partner interviews where they had observed some concern amongst staff that SiG intervention would lead to job cuts, but over time came to realise that SiG was working to secure jobs rather than remove them.
- 5.30 Only 12 respondents were able to quantify the number of jobs created/retained due to SiG support by March 2020. On average, these **firms created/retained 37 full-time-equivalent (FTE) jobs** that were attributed to SiG (gross), equivalent to an 8% increase in employment between when they first engaged with SiG and March 2020 (as a reminder, 85% of survey respondents were medium sized at the time of interview, and 15% were large). It is important to note that this is the number of 'direct' jobs created within the beneficiary firm (rather than including supply chain jobs) and the change in total FTE jobs attributed to SiG (and therefore differs to monitoring data on 'job years' presented in Section 4). Also, it is based on a small sample and refers to self-reported gross figures, not taking into account the counterfactual (and therefore differs to the econometric analysis in Section 6). That said, when we compare the results of this self-reported sample to the econometric analysis of SiG's population, we observe the effect of a similar magnitude on the number of jobs created/retained.
- 5.31 There is also some evidence to suggest that SiG is **contributing towards increased salaries** in the firms supported: 18 out of 33 survey respondents reported an increase in staff salaries. This appears to have been achieved by improving the skills and productivity of staff via SiG, leading to a willingness and ability amongst firms to pay

their staff more (see case study example below). However, only eight of these were able to quantify the uplift in salaries for manufacturing and production staff on average, with the increase ranging from 3% to 25% between when they first engaged with SiG and March 2020, and an average of 12% per firm. Whilst the sample size is small, the survey results suggest that approximately one-fifth of jobs created had salaries above £43,000 (i.e. over the 75th percentile UK gross annual salaries, ASHE 2019).

#### **Case study example (7)**

Through their interaction with the SiG team members who were embedded within the company, employees in the firm were able to learn industry best practice. As employees learned best practice and upskilled, they were promoted within the company. This, in turn, resulted in higher salaries for more staff. This is likely to continue in future, as the firm is now more aware of the benefits of highly skilled staff and now invests more heavily in its own team as a result of the SiG programme.

### **Turnover and profitability**

5.32 The survey also found that SiG had led to an increase in turnover and profitability for nearly two-thirds of respondents by March 2020 (21 and 20 respondents, respectively), and a further six firms expected these benefits to arise the two years from April 2020. Only nine respondents were willing to quantify the uplift in turnover due to SiG, which averaged just over £4m per firm (cumulative figures) between the start of SiG support and March 2020. It is important to highlight this is a self-reported gross figure (and therefore differs to the net figures presented in Section 6 below).

#### **Case study example (5)**

Cultural and managerial changes in combination with improvements to factory layout made as a result of SiG support led to an increase in overall productivity and accelerated growth. The new factory opened in 2016, and from 2014 to March 2020, the firm increased its turnover from £5.4 million to £8.8 million, and its headcount from 51 to 85.

#### **Case study example (4)**

The first outcome for the business was operational improvement. This was enabled by the implementation of lean techniques and, relatedly, more effective management and leadership practices e.g. visual management, introduced by the SiG team and external providers. It was relatively straightforward to achieve tangible “quick wins” in this area through dedicated, timebound activities focussed on specific areas in the business. By improving its operational performance, the beneficiary reduced its costs and could offer more competitive pricing. This resulted in new contracts being won and contributed to the overall growth of the business – turnover grew to £43m by March 2020. These improvements also enabled the beneficiary to expand its portfolio of products and deliver contracts that required it to develop new product types.

5.33 Across all of the business performance metrics above, the survey evidence suggests that the large majority of respondents have experience and/or will observe an impact on contracts and jobs (and to a slightly lesser extent, turnover and profitability). **There is a small group of firms who consistently have not achieved any improvement against these metrics**, which fall into three groups:

- four firms are relatively new to the programme, having started support in 2019 or 2020, and so it was too early to comment and/or progress has been hindered by Covid-19
- two firms were engaged with SiG earlier and experienced growth but would not attribute that to SiG at all, and commented on issues in relation to the support (discussed below) or attributed change entirely to other external factors (e.g. market demand, purchase of new equipment)
- one firm stated they were close to bankruptcy and were not able to engage in business improvements.

### Improved performance of delivery partners

5.34 In addition to participating firms, the logic model sets out how SiG is expected to improve the performance of delivery partners, through their experience of delivering support to firms on the programme. Three of the eight delivery partners consulted highlighted benefits gained from providing SiG support:

- **Improved service offering to align more closely with business needs:** three delivery partners argued they now have greater knowledge of barriers to growth and the needs of small/medium sized firms in terms of support, and have used this knowledge to think more strategically about their offering and improve their wider service solutions to SMEs.
- **Improved sector knowledge of staff:** one partner has developed their own staff's understanding and experience of the aerospace sector, and has since presented at a Women in Aerospace event.

*"It has enabled us to think more strategically about our offering by giving us the knowledge of what MSEs need and the barriers they face"*

Delivery partner

5.35 To put this into context, whilst delivery partners all had some experience in the aerospace sector (to varying degrees) prior to SiG, this rarely focused on the supply chain. Instead, six out of the eight partners consulted said they had been primarily involved with larger companies. In addition to SiG raising smaller supply chain firms' awareness of private support available, it has also **enabled providers to better shape their offering to supply chain firms' needs**.

### Unintended and unexpected consequences

5.36 The evaluation has also explored unintended and unexpected consequences arising from SiG support. The following two points were identified.

- 5.37 First, a minority of stakeholders expressed concern around **capacity issues** within the SiG beneficiaries, given the substantial time commitment required to participate in SiG (see illustrative quote in the adjacent box). However, this concern was not fully borne out by the survey, where the majority of businesses (27 out of 33 respondents, 82%) reported that participation in SiG had not prevented them from engaging in other business development or management activities, with the five that did noting this was only to some extent or a little (and primarily related to administration demands).
- 5.38 That said, two case studies found that the intensive nature of SiG, particularly during the diagnostics/engage phase, had **short-term impacts on business performance prior to longer-term gains**. As illustrated in the examples below, this had implications for the capacity of leadership/management staff to carry out their day-to-day roles and – in two cases – business performance dropped in the short term. However, on balance, most case study firms viewed this as a necessary side effect of change management and recognised the long-term value of this process in achieving transformational change.

*"It was all-encompassing at the time. It took a lot of resource from the business but that was for all of the right reasons and worth the commitment."*

*"You need to be willing to roll your sleeves up and work hard" to get benefits out of SiG. "Not something to take on lightly...but returns can be tremendous"*

Beneficiary survey respondents

#### **Case study example (2)**

The SiG diagnostics process was beneficial and instrumental in enabling the firm to identify key inefficiencies. Nonetheless, the process was highly resource intensive, drawing heavily on middle management which meant they had less time to carry out their roles effectively, affecting the firm's performance in some areas in short term, prior to longer-term gains.

#### **Case study example (4)**

This firm felt that SiG did not provide the leadership team with sufficient support in change management. For example, some parts of the business took a dip in performance whilst going through the transformation journey. Whilst this was expected and necessary, some members of the management team found this challenging – by the end of the programme there had been a turnover in 50% of the firm's leadership team. Therefore, it was felt that SiG should not only make very clear at the start of the programme just how intensive it will be, but could also provide businesses with more support around managing change throughout.

- 5.39 Second, external stakeholders and beneficiaries commented on the unexpected impact of SiG on **business resilience and agility** in the context of Covid-19. This relates both to changes made as a result of SiG that have improved the competitiveness and

efficiency of the firm, putting them in a stronger position when the sector took a downturn, as well as improving their agility and ability to pivot in response to opportunities presented by Covid-19, as illustrated below.

**Case study example (5)**

This firm was able to respond to the UK Government's Covid-19 Ventilator Challenge. The consultee argued this would not have been possible without the improved delivery and quality performance driven by SiG, which enabled the firm to be agile in its operations and pivot very quickly.

**Case study example (1)**

SiG has enabled this firm to become more resilient and agile than it otherwise would have been, partly because of improved employee engagement and supply chain management (as well as the firm's small size, making it nimble). As a result, in the early stages of the pandemic, the firm was able to respond quickly to the shortfall in PPE by building a supply chain and designing/manufacturing visors for the NHS within two weeks. In addition, all staff spent some time on the PPE manufacturing line which further improved employee engagement.



## 6. Econometric analysis of key outcomes

### Key messages

As part of the counterfactual assessment (what would have happened in the absence of SiG), we undertook econometric analysis to estimate the SiG programme's net impact on business performance of beneficiaries. This involved comparing observed outcomes of beneficiaries with the same outcomes for unsupported companies drawn from six different comparison groups. The analysis used difference-in-differences and propensity score matching methods to estimate the effects.

**The results from the econometric analysis suggest that SiG has had a statistically significant impact on employment and turnover of beneficiaries. From 2013 to 2019, SiG directly generated approximately:**

- **2,500 to 3,495 additional jobs across all beneficiaries**
- **£799m to £1,145m in additional turnover for beneficiaries.**

**However, we found no statistically significant effects on wages, turnover per employee (as a proxy for productivity<sup>41</sup>), or the ratio of costs of sales to turnover (as an alternative measure of productivity/effectiveness).** It is worth noting that the business survey found some evidence of positive effects on wages and productivity.

The estimates above represent the direct effect of the SiG programme on beneficiaries and do not include any indirect or spillover effects on the wider supply chain. Also, the estimates reflect different cohorts of beneficiaries with some having completed the programme and others still in receipt of support (and so these businesses may not have experienced the benefits to the full extent).

Overall, the results suggest that SiG had a major positive impact on business beneficiaries in terms of employment and turnover. This is encouraging given the long timescales involved in realising impacts in the aerospace sector.

6.1 This Section sets out the results of the econometric analysis of key programme outcomes. It compares changes in the performance of beneficiaries to unsupported companies from selected comparison groups; thereby informing the counterfactual position i.e. what would have happened in the absence of SiG. The estimates

<sup>41</sup> Note, the evidence presented in Section 5 on productivity is self-reported by a sample of beneficiaries, based on their own interpretation of what productivity means for their business. In Section 6, it is important to highlight that turnover per employee is used as a *proxy* for productivity. The measures are therefore different. The econometrics did not find the increase in productivity to be *statistically significant compared to the comparison groups* at the 95% confidence level. This may be due to two reasons: (i) both turnover and employment experiencing uplifts in the analysis period and/or (ii) the lag time between productivity changes being observed in practice within the business (i.e. as reported in the survey undertaken in Autumn 2020) and data available to demonstrate this in Fame database used for the econometrics, which was available to 2019/20 FY.



presented in this Section relate to changes in key measures of business performance: employment, turnover, wages, and productivity. Further details on the econometric methodology and analysis can be found in Annex B.

## Approach

- 6.2 To estimate the net impact of SiG on supported business we used a **difference-in-difference (DiD) approach**. This estimates the causal effects of SiG support by comparing changes in impact measures before and after the intervention across supported (the treatment group) and unsupported (the comparison group) businesses. By combining data on business performance from different periods in time across the treatment and comparison groups, DiD attributes to the intervention (in this case the SiG programme) only changes in outcome measures which exceed those observed in the comparison group.
- 6.3 The principal assumption behind this approach – known as the ‘parallel trends’ assumption – is that in absence of treatment, beneficiaries are assumed to follow the same trajectory as firms in the comparison group. This is a strict assumption which is often violated since supported companies are likely to systematically differ from the wider business population on both observed and unobserved characteristics. This issue is known as selection bias.
- 6.4 If this assumption is violated, the DiD estimate may wrongly attribute effects of pre-existing group trends (e.g. if the programme’s beneficiaries are more ambitious, faster growing companies than most of the wider business population), external events (e.g. Brexit), or general economic conditions to the programme (if those effects and conditions affect supported and unsupported companies differently).
- 6.5 To overcome this issue, we used data which covers the period from 2010 to 2019 (data which underpinned the analysis is discussed in more detail below). This allowed a graphical analysis to determine the validity of the parallel trends assumption. It also enabled the use of a more flexible, regression-based model which allowed us to relax this assumption (to a certain degree). The specification of the model can be found in Annex B.
- 6.6 In addition to this we used a statistical matching technique – **Propensity Score Matching (PSM)**. This technique enables the identification of a comparison group that consists only of companies which have similar observed characteristics to treated companies. This reduces selection bias, improving the model’s internal and external validity and further enhancing robustness to violations of the parallel trends assumption.
- 6.7 PSM is achieved by first estimating the likelihood of exposure to treatment for each company, based on observed characteristics, and then identifying unsupported businesses that were as likely to receive support as the beneficiaries.

- 6.8 It is important to note that in our analysis, PSM was not used to directly assess the effect of receiving SiG support (e.g. by comparing outcomes in pairs of companies with a similar likelihood of being treated). Instead, it was used to identify groups of unsupported companies that were like SiG beneficiaries, which were then used as a counterfactual in the DiD model.
- 6.9 The econometric model used in this analysis captured the variation in the years in which SiG beneficiaries received treatment. This recognised that SiG is a tailored programme (there may be differences in duration of support provided across beneficiaries) and that there was a natural phasing in take up of support (some companies were engaged earlier than others). This allowed us to isolate the effect of the programme from the effects of external events happening in the economy at different points in time. The model also differentiated between ‘during support’ and ‘after support’ periods, capturing the fact that outcomes related to business performance often require several years to fully realise.
- 6.10 Our econometric analysis focused on the effects of SiG support on **five key outcome measures: employment, turnover, average wages, turnover per employee,<sup>42</sup> ratio of costs of sales to turnover.**<sup>43</sup>
- 6.11 **We used a panel dataset (i.e. containing observation on companies over time) covering the 10 years between 2010 and 2019.**<sup>44</sup> This contained data on all outcome measures as well as additional observable characteristics used for statistical matching.<sup>45</sup> **The treatment group used within our analysis was drawn from a list<sup>46</sup> of beneficiaries provided by SiG in April 2020 and included 73 firms that had received, or were currently receiving support.**<sup>47</sup>

## Constructing the ‘comparison’ groups

- 6.12 We used **six comparison groups** as identified in Table 6-1. The quality of each group was assessed with graphical analysis and formal statistical tests.

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<sup>42</sup> Proxy for productivity.

<sup>43</sup> This ratio was used to reflect the fact that costs may be reduced as a result of a decline in sales, and therefore analysing the level of costs would not necessarily provide an objective view of the effects of the programme. It can be considered an alternative measure for productivity.

<sup>44</sup> The dataset assigns FY years to the calendar years which contain the larger part of the FYs. In other words, for the majority analysed companies 2013 refers to 2013/2014 FY, while 2019 is 2019/2020 FY. However, companies may operate using different FYs, and our dataset does not specify what FY convention each company uses. Therefore in our econometric analysis we refer to calendar years.

<sup>45</sup> These included: age (since incorporation), profit per employee, turnover per employee, return to assets, average remuneration, average growth of turnover and employment between 2010 and 2012, company’s level of risk, number of trading addresses, number of companies in the corporate group, NUTS region and whether the company was an SME.

<sup>46</sup> The list also included unsuccessful in their application for support, but these were not part of the treatment group

<sup>47</sup> The 73 companies included those which left the programme early. We recognise that those businesses may be considered to be a separate treatment group. To preserve the sample size, those companies were included in the analysis alongside the beneficiaries which completed the full programme. However, the statistical model used for the analysis accounted for the duration of treatment (as well as its timing). The exact model specification is presented in Annex B:.

**Table 6-1: Comparison groups used within the econometric analysis**

<b>Comparison groups</b>
'Top 100' supply chain companies provided by BEIS in April 2020 - greatest industry relevance and largest based on a combination of turnover and employment
A subgroup of the 'Top 100' supply chain companies provided that were most similar to SiG beneficiaries, identified using PSM (one-to-one matching)
A subgroup of all companies falling under an agreed set of SIC codes available on Fame database <sup>48</sup> identified using PSM (one-to-one matching)
A subgroup of all companies falling under an agreed set of SIC codes available on Fame, identified using PSM (on-to-many matching)
A subgroup of all companies falling under an agreed set of SIC codes available on Fame, identified using PSM and a reduced set of matching characteristics <sup>49</sup> (one-to-one matching)
A subgroup of all companies falling under an agreed set of SIC codes available on Fame, identified using PSM and a reduced set of matching characteristics (one-to-many matching).

Source: SQW

- 6.13 In Table 6-1, 'one-to-one matching' refers to an application of PSM where, for each SiG beneficiary included in the estimation of the likelihood of receiving support, an unsupported company with the closest estimate was added to the comparison group. One-to-many matching refers to an application of PSM where more than one unsupported company corresponded to each SiG beneficiary, which allowed us to increase the sample size.
- 6.14 The list of relevant standard industry classification (SIC) codes used to identify the pool of companies considered for comparison groups was agreed with BEIS. It included the seven codes which were primary for at least five SiG beneficiaries,<sup>50</sup> reflecting the fact that not all SiG beneficiaries considered were directly involved in manufacturing aircrafts.

<sup>48</sup> Fame, by Bureau van Dijk contains information on business performance of UK companies and is largely based on information firms submit to Companies House. The relevant data was extracted by BEIS and analysed by SQW.

<sup>49</sup> The reduced set of matching characteristics included: number of employees, age since incorporation and nuts region, and was used to assess the sensitivity of results to the choice of observable characteristics used to create comparison groups

<sup>50</sup> The seven SIC codes were: 22.66, 25.99, 26.11, 28.99,30.30, 32.99, 71.129. A brief description of the codes is available in Annex B

## Results

- 6.15 This Section summarises the results of our econometric analysis with more detailed analysis, presented in Annex B:. All monetary values included within our analysis were converted to real terms in 2019 prices using the HM Treasury GDP Deflator.<sup>51</sup>
- 6.16 **We estimate that SiG has had a statistically significant impact on employment and turnover of beneficiaries.<sup>52</sup> In the period 2013 to 2019, SiG directly generated around:**
- **2,500 to 3,495 additional jobs across all beneficiaries<sup>53</sup>**
  - **£799m to £1,145m in additional turnover for beneficiaries.**
- 6.17 This is equivalent to the following impacts per company:
- 17 to 23 additional jobs during the programme, and 53 to 76 additional jobs after the support<sup>54</sup>
  - 8% to 12% (£1.6m - £2.8m) higher annual turnover during programme, and 26% to 33% (£5.6m - £7.6m) higher annual turnover after the support.<sup>55</sup>
- 6.18 In addition, we found no statistically significant effect on average wages, turnover per employee or the ratio of costs of sales to turnover. The observed changes in these measures for SiG beneficiaries did not exceed the changes observed in the comparison groups and therefore could not be directly attributed to the programme.
- 6.19 However, this result may be driven by the fact that only seven beneficiaries completed the programme more than two years ago. Since productivity benefits can take several years to come through in the analysed measures, it may be too early to draw definitive conclusions on the effects of SiG support on beneficiaries' productivity.
- 6.20 In reporting the above employment and turnover impacts which are also presented in Table 6-2 we highlight following points.
- The ranges are presented to reflect the variation in results estimated using different comparison groups and are calculated based on the least and most conservative statistically significant estimate obtained.
  - The estimates represent the direct effect of the SiG programme on beneficiaries. They do not take into account any indirect or spillover effects on the wider supply chain which may have occurred.

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<sup>51</sup> At the time of analysis the GDP deflator for 2020 was not available. Latest data available at: <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-december-2020-quarterly-national-accounts>

<sup>52</sup> This conclusion is robust to changes within our statistical model and/or comparison groups used, as described in Annex B.

<sup>53</sup> Jobs created and safeguarded.

<sup>54</sup> The estimate of the effect of SiG on employment in beneficiaries after support includes within any jobs created within that firm whilst in receipt of SiG support.

<sup>55</sup> The percentage increases are based on the results obtained from the econometric model. The absolute increases were calculated by combining these results with data on the average pre-treatment turnover observed among SiG beneficiaries. A more detailed description of the steps taken to arrive at the per-company and aggregate impacts of SiG is presented in Annex B:.

- The estimates account for the fact that some beneficiaries have already completed the programme while some are still in receipt of support and have not yet experienced the benefits to the full extent.
- The estimates represent the impact of the programme on turnover and employment of its beneficiaries in the period between 2013 and 2019. Calendar years were used to reflect the fact that beneficiaries may operate under different financial year conventions. Financial years were assigned to the calendar years which contained the larger part of the FYs, e.g. the 2019/20 FY ending on the 31st of March 2020 was assigned to the 2019 calendar year.
- A more detailed description of how the estimates were obtained, including a discussion of statistical models used and any assumptions made when calculating the aggregate impacts, is available in Annex B:.

**Table 6-2: Estimates for overall impact of SiG on employment and turnover of beneficiaries since 2013**

	Average level among SiG beneficiaries before receiving support <sup>56</sup>	Average (per company) increase whilst receiving support relative to comparison groups	Average (per company) increase after receiving support relative to comparison groups	Total net increase across all beneficiaries between 2013-2019
Real Annual Turnover (2019 £m)	£21.7m	£1.6m – £2.8m per year	£5.6m – £7.6m per year	£799m – £1,145m <sup>57</sup> cumulative
Jobs pre-SiG and created/safeguarded as a result of SiG	155	17 – 23	53 – 76	2,500 – 3,495

Source: SQW

6.21 The econometric analysis involved conducting **numerous robustness checks**, including: a) using six alternative comparison groups, b) varying the set of observable characteristics of businesses used to create the comparison groups, c) introducing additional control variables into our statistical model, and d) considering two alternative specifications of the model to account for possible violations of the parallel trends assumption. **The results were largely unaffected by any of the changes – even**

<sup>56</sup> The reported pre-treatment levels of employment and turnover were averaged across companies and all pre-treatment periods for which the data is available (the number of available pre-treatment periods varied by company). This is to reflect the volatility (rather than a monotonic growth) in the pre-treatment levels over time, which was revealed through a graphical analysis of pre-existing trends during the assessment of validity of assumptions underpinning the DiD methodology. Taking the average levels in the last pre-treatment period could result in a less accurate estimate of the aggregate impact of SiG.

<sup>57</sup> The estimated aggregate effect on turnover during support was between £281m – £441m and for after support it was £518m - £703m.

where estimates differed, they fell within the estimated 95% confidence intervals.<sup>58</sup> This lends credibility to our findings. Further details on the econometric approach are available in Annex B:

- 6.22 The width of the estimated ranges for the effects of SiG support on turnover and employment reflects: a) the variation of outcomes observed among individual beneficiaries, and b) differences in growth observed across the comparison groups. The relatively small sample of supported companies does not allow us to narrow down the range. However, based on our analysis of stability of results during robustness checks and taking into account the logic underpinning the choice of comparison groups, we consider one-to-one matching to the list of the 'Top 100' supply chain companies and companies with relevant SIC codes to provide the strongest comparison groups. Considering this, the impacts of the programme are likely to be closer to the upper bounds of suggested ranges.
- 6.23 The results of our econometric analysis suggest that overall SiG had a major positive impact on beneficiaries which reflects the intensity and duration of support, as well as the tailored nature of the programme.

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<sup>58</sup> Despite all the measures taken to ensure the econometric estimates of the effect of the programme are as precise as possible, the true effect can differ from the obtained point estimate. The 95% confidence interval is a range of values around the point estimate which is 95% likely to contain the true effect.

## 7. Wider impacts

### Key messages

Wider impacts and spillovers are an important consequence of SiG, particularly given how resources are focused on a relatively limited number of firms. However, there is limited evidence to date of widespread spillovers occurring as a result of SiG. The evaluation has found some examples of spillovers within and across the beneficiary firms, as well as for their own customers and supply chains, and across the wider aerospace sector and into other sectors more generally. It is important to caveat these findings, as they are based on the bounded knowledge of those consulted.

The key wider impacts and spillovers perceived by beneficiaries are summarised below, alongside how these spillovers have occurred and for whom:

- **Knowledge spillovers across beneficiary firms** involved in SiG, including firms who were previously considered collaborators, driven largely via SiG's peer-to-peer, cohort approach. This has led to strengthened networks, from informal through to new commercial relationships between beneficiaries. Evidence of these spillovers came from multiple sources, but was largely anecdotal.
- **Knowledge spillovers generated for collaborators** not already involved in SiG, driven by SiG's impact on changing mindsets and willingness/confidence of beneficiaries to engage in more collaborative R&D. This was observed by a small minority of cases only.
- **Market spillovers for customers of beneficiary firms**, driven by the impact of SiG on costs/prices, quality and reliability. It is important to reiterate this is from the beneficiary perspective. Spillovers for suppliers of beneficiary firms, reflecting the greater volume of orders placed by SiG beneficiaries (due to contracts won/retained). As above, this is from the beneficiary perspective.
- **Knowledge spill-ins for participating firms**, for example, good practice from the automotive sector. In part this was due to SiG providers and the beneficiary base serving non-aerospace markets, although the extent of spill-ins varied across those surveyed from small to large.

There were also anecdotal examples of where beneficiary firms have become more engaged in wider sector or local economic development forums, leading to scope for wider societal externalities. Beneficiaries' perspective on scope for wider, longer-term impacts on the aerospace sector as a result of SiG was relatively positive, but evidence from external stakeholders was more mixed. Whilst there are examples of dissemination or wider sector activities delivered by SiG, the mechanisms for spillovers appear to be ad hoc and engagement with key stakeholders (as an intermediary to wider sector impact) could be strengthened.



7.1 This section summarises evidence on the extent to which SiG has brought about wider benefits and spillovers for the firms supported and for the wider aerospace supply chain or other sectors, and reflects on the (potential) longer term impacts of SiG. It draws on findings from the survey, case studies, and consultations with SIG staff, delivery partners and external stakeholders. It is important to note that spillovers are often hard to identify, measure and quantify. Those consulted will only be partially sighted on spillover effects, and therefore the findings below should be interpreted bearing in mind that they are the perceptions of those consulted.

## Wider benefits and spillovers

7.2 As set out in the logic model, SiG was expected to encourage “knowledge spillovers across aerospace and into other sectors”, potentially leading to an improvement in the performance of the wider UK aerospace supply chain. There are three main types of spillovers commonly used in the literature: market, knowledge, and network (Table 7-1)<sup>59</sup>. This has informed our analysis of the feedback on spillovers arising from SiG, alongside a review of mechanisms that have facilitated spillovers (or conditions that support the generation of spillovers (i.e. influencing the likelihood of spillover effects occurring) and which groups have benefitted from spillover effects (i.e. customers, collaborators, suppliers, competitors).

**Table 7-1: Spillovers – definitions**

	<b>Definition in the context of SiG</b>
Knowledge	Knowledge and capabilities created by one firm that spills over into other firms, creating value for them and their customers (i.e. public good).
Market	The workings of the market(s) for improved leadership and management practices and operational processes create benefits for consumers and non-innovating firms. When a firm improves operationally (e.g. reduces the cost of production, improves quality or reliability), market forces will tend to cause some of the benefits to be passed on to customers.
Network	This occurs where there are interdependencies between certain technologies. The profitability of a set of interrelated and interdependent technologies may depend on achieving a critical mass of success. As a result of these relationships, each firm pursuing one or more of these related technologies creates economic benefits for other firms and their customers. This spillover is less relevant to SiG.

Source: Jaffe et al (1996) and SQW

7.3 Overall, the evaluation has identified examples of how SiG is generating wider impacts and spillovers within and across the beneficiary firms, as well as for their own supply

<sup>59</sup> Jaffe, A.B. (1996) Economic Analysis of Research Spillovers Implications for the Advanced Technology Program, Brandeis University and National Bureau of Economic Research.

chains, and across the wider aerospace sector and into other sectors more generally. We discuss each in turn below.

## Wider benefits and spillovers for SiG beneficiaries

- 7.4 First, the survey and case study evidence highlight how - building on the confidence and capability, and changed mindsets and cultures, gained through SiG - a minority of beneficiaries have **become more involved in wider activities**. The case studies demonstrated how firms have become more willing to engage in collaborative R&D and share knowledge with collaborators, and engage more broadly with Government, media and local communities (see case studies below). The survey also found almost a third of respondents (9 out of 30) reported **spillover benefits to collaborators**.

### Case study example (5)

In terms of collaboration, driven by both a desire to “give back” after benefitting from SiG and an enhanced awareness of public image, the firm has increased its engagement with government, media and the local community – identified as an unintended consequence of SiG. For example, representatives from the firm are now part of a Local Skills Partnership and involved in local cluster development activities, are formally engaged in ADS Group, and are on the board of a local college.

### Case study example (4)

This case study illustrated how SiG’s targeted leadership training led to a notable shift towards a high performing, ambitious and modern culture. This mindset change also meant the firm became more open to collaboration, and as a result, became involved in several new R&D collaborations.

- 7.5 Second, there is evidence to demonstrate how SiG is leading to strengthened networks and relationships, knowledge sharing and collaboration across the beneficiary firms involved in the programme, leading to knowledge spillovers. This includes knowledge sharing with beneficiaries who previously were considered competitors. This has been facilitated by the central SiG activities designed to bring beneficiaries together and encourage peer-to-peer networking, such as the STAR days (hosted by beneficiaries in turn), the All Star annual conference, roundtable sessions for participating CEOs, and the ‘cohort approach’ to support, such as the Team Leader Academy. SiG staff embedded in multiple firms also encourage ‘cross-fertilisation’ of ideas and facilitate connections. Beneficiaries and the SiG staff provided examples of where firms involved in the programme have shared knowledge/experiences, collaborated and even entered commercial agreements as a result of the networking opportunities provided by SiG. It was argued by SiG that the programme has helped to create “a trusted network” of firms. This was corroborated by delivery partners and most external stakeholders consulted, who recognised the benefits of SiG’s “peer support network” in changing attitudes, raising ambition and encouraging a “collective vision” across those involved.

- 7.6 Third, SiG has **encouraged spill-ins of knowledge from other sectors**. The majority of survey respondents (21 out of 30) reported that SiG had encouraged this, although respondents were evenly split between whether this was to a small, moderate or large extent. One business commented that “there has been encouragement for knowledge to spill in – a lot of the changes we’ve implemented come from the automotive industry”, with another noting that STAR days “have helped to share information between sectors as some SIG businesses work across different sectors.”

### Wider benefits and spillovers for SiG beneficiaries’ supply chains

- 7.7 From a beneficiary perspective, **SiG is also leading to benefits for their customers and, to a lesser degree, their suppliers**. To note, whilst these outcomes appear plausible given the improvements described in the sections above, it has not been possible to corroborate this with the views of customers or suppliers within the scope of this study.
- 7.8 Four-fifths (24 out of 30) of survey respondents identified **spillovers to customers** (see Figure 7-1 below). The key mechanisms enabling this were internal improvements to beneficiary firms which allowed them to supply improved quality products, at lower prices, and/or at faster and more reliable delivery times. One external stakeholder also noted improvements in supplier responsiveness and on-time delivery, whilst another reported increases in the quality of production (i.e. fewer defects in the parts supplied). It was also recognised that some benefits to customers will be longer term, for example it may take time for lower costs to feed through to Primes.
- 7.9 By inference, there is also scope for SiG to **influence the competitiveness of non-aerospace customers**, given only about one-fifth of respondents (4 out of 25) derived 100% of their turnover from aerospace customers. As such, business improvements in firms that serve non-aerospace customers may lead to spillover benefits in other sectors. One example of this is a case study where SiG provided support to implement a new product introduction process, which in was reportedly crucial in winning contracts from non-aerospace customers.
- 7.10 In addition, over one-third of survey respondents (13 out of 30,) argued that improvements they had made as a result of SiG had already led to **spillover benefits to their suppliers**. This includes those in the aerospace supply chain as well as other parts of the manufacturing sector, and materials suppliers. The most common mechanisms for generating these spillover benefits were through SiG beneficiaries placing a greater **volume of orders** with their suppliers (as a result of retaining/winning new contracts with support from SiG) and/or **improving their communication** with suppliers to give

*“We have tried to make sure that our processes and procedures are more professional in the way that we deal with suppliers”*

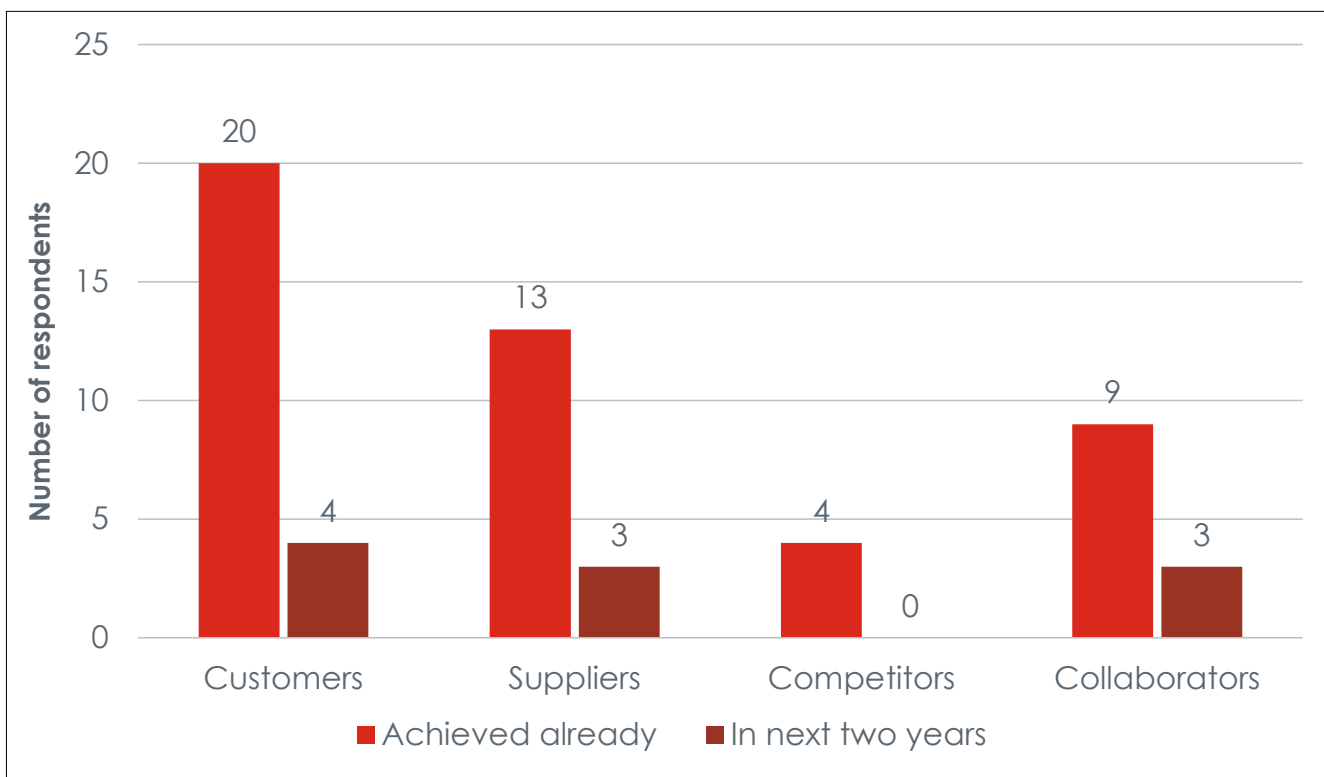
*“Our key suppliers have had an increase in business from us...the main benefit for them is that we are more organised so we can provide greater notice on work”*

Survey respondents

suppliers greater certainty about the timing and scale of future orders (again, through improved management practices gained through SiG). Two beneficiaries also identified that their suppliers had benefitted through **knowledge and skills transfers** (see examples below). However, only one beneficiary reported an increase in employment at suppliers (because of a 45% increase in volume of orders placed) but could not quantify the scale of the new employment.

7.11 Spillovers to competitors was less evident, with only four survey respondents suggesting competitors had benefitted indirectly as a result of their participation in SiG. The case study example below provides an illustration of this.

**Figure 7-1: Have any of the following also benefited indirectly as a result of your involvement in SiG, or will benefit in the next two years? (n=30)**



Source: SQW

**Survey examples**

The first example is a firm who engaged in a ‘supplier quality group’ through which supplier audits were set up. This encouraged knowledge spillovers by enabling the SiG beneficiary to pass on key skills and learnings it gained from SiG to its suppliers, thus helping to improve the quality of suppliers’ outputs.

In the second example, a firm’s engagement with SiG has benefitted competitors in the form of sharing best practice. The SiG transformation process made the beneficiary company aware of how other businesses could learn from its experience, with the firm subsequently using its story to talk to competitors through SiG.

In a third example, the firm identified that both customers and suppliers have benefited from their engagement with SiG. The former benefit by receiving better quality products on time and for a lower cost because of improvements in the SiG beneficiary firm. In turn, this enables the customer to successfully fulfil their own orders further up the supply chain. Working with SiG also highlighted that the beneficiary could improve communications with suppliers. The resulting improved communication means suppliers have greater certainty over long-term orders, thus helping to inform their own business planning.

## Longer-term impacts and spillovers for the wider aerospace sector and other sectors

- 7.12 The logic model sets out how SiG was intended to create a more competitive and diverse UK aerospace sector, with improved sector strength and resilience. We can clearly see that, as discussed in the Sections above, the programme has performed well in improving the competitiveness of firms supported. This message was consistent across most beneficiaries, delivery partners and external stakeholders consulted. However, SiG was also expected to have longer-term impacts and knowledge spillovers across the wider aerospace sector (and other sectors), and help to anchor future production in the UK. This ‘spread’ of benefits is important to maximise the programme’s impact, particularly given SiG supports a relatively small number of businesses directly.
- 7.13 **Beneficiaries’ perspective on wider impacts was relatively positive** (see Table 7-2), and appear to be more optimistic about SiG’s role in promoting innovation and anchoring production in the UK than they were when asked about these impacts on their own businesses.
- 7.14 The large majority of survey respondents (23 out of 25) believed SiG had, or was expected to, contribute to a more competitive and diverse sector, as well as anchoring future production in the UK. This was corroborated by some delivery partners and external stakeholders, who argued that SiG had kept the supply chain activity in the UK (instead of moving to Asia). However, this appeared to be via direct support to firms, rather than a sense SiG had indirectly influenced the wider sector.

*“SiG helped to retain and improve the capabilities of the UK supply chain, which influenced OEM procurement decisions to keep supply chain work in the UK”*

Delivery partner

7.15 Around two thirds of respondents (16 out of 25) reported that SiG had contributed to promoting, or was expected to, innovation in the wider aerospace sector. However, there was no consensus amongst external stakeholders or delivery partners on whether SiG was actually promoting innovation in the wider sector (or intended to), as discussed earlier in the report and illustrated in the adjacent box.

*“SiG support is tailored to each firm and involves the adoption of new to firm processes rather than developing new knowledge which can be shared with others”*

External stakeholder

**Table 7-2: Beneficiary survey: Contribution of SiG to longer-term impacts for UK aerospace industry by March 2020 (N=25)**

	<b>Achieved by March 2020</b>	<b>Expected in the two years from April 2020</b>
Promoting innovation in the wider aerospace sector	15	1
A more competitive and diverse aerospace engineering sector	18	5
Anchoring future production and manufacturing in the UK	19	4

Source: SQW

- 7.16 The evaluation has identified **some mechanisms that have facilitated spillovers** to the wider sector, in addition to via beneficiaries’ suppliers/customers. This includes:
- central activity by the SiG team, including the All STAR annual conference (where banks, trade associations, LEPs, Devolved Authorities, industry committees and policy bodies are invited to attend).
  - wider sector/policy influencing activities such as published SiG case studies (e.g. by EEF, CBI, Nat West, Deloitte), media releases (c.100 per annum) and presentations at sector events.
  - participation in national panels (e.g. the National Manufacturing Working Group, and Queens award for Innovation).
  - more recently, growing interest/scope for transferrable lessons from the SiG model into sectors such as engineering, renewable energy, defence, health and construction (illustrated by a new SiG programme for the offshore wind sector<sup>60</sup>).
  - some emerging evidence that SiG beneficiaries themselves are playing a greater role in disseminating knowledge and acting as ambassadors for the programme/sector, for example, through participation in BEIS sector roundtable events. In part, this was attributed to the confidence and capabilities gained through participation in SiG (as discussed above).

<sup>60</sup> See [here](#).

- To note, there was no evidence of labour mobility being a key driver of knowledge spillovers, as set out in the original rationale.
- 7.17 Evidence from external stakeholders (whom we might expect to play a role in / be aware of spillovers in the sector they represent) was more mixed than beneficiary perspectives. External stakeholders were largely unable to cite evidence of such benefits being achieved in practice, were unclear on whether this was the role of SiG, and were unsure of the mechanisms through which spillovers were expected to happen (beyond ad hoc events/conferences). Also, as discussed in Section 9, there is mixed feedback on the effectiveness of engagement and partnership working with external stakeholders, which is an important mechanism for/route to wider sector impacts.



## 8. Additionality and contribution

### Key messages

**We conclude medium outcome additionality for the SiG programme** based on the results from the business survey (32 respondents). For just over one-quarter of businesses outcomes would not have occurred at all or would have happened outside the UK. For over half of the businesses, outcomes would have occurred at a slower rate without SiG - it would have taken up to five years or more to achieve outcomes (17 respondents). Around one-quarter of businesses reported outcomes would have occurred at a smaller scale without SiG; and for a small minority the outcomes would not have been of the same quality (4 respondents). Only two respondents would have achieved the outcomes anyway in the UK.

**Overall, the stakeholder evidence supports the findings of the business survey (and case studies). Most stakeholders (six out of seven) perceived that outcomes would not have occurred at all, occurred outside the UK, or occurred at a slower rate and scale.** The majority view amongst stakeholders was that SiG had accelerated outcomes. This is in line with the results of the business survey.

The SiG programme has implemented activities as set out in the logic model and theory of change. In practice, these activities have been longer term (over four years), intensive and holistic. These activities related to **diagnostic assessments; high intensity support from SiG staff and externally contracted delivery partners; and ongoing support to ensure training is embedded and leads to improvement for businesses.** The main drivers for the activities included: long-term SiG funding and tailored support; the SiG selection process resulting in the right businesses being supported; the delivery mechanism, including use of external delivery partners, leading to sustained demand for SiG. The activities have translated into key outputs and outcomes as reported in Sections 4-7.

The business survey and case studies identified a range of other factors internal and external to business beneficiaries contributing to the outcomes described. For example, new senior management team/business leadership in place; other R&D activities in the business; market demand and external sector and economic conditions; technology changes and developments. The role of SiG in realising the outcomes relative to these other factors were described by business beneficiaries to be **'critical' and 'important'**.

**This is generally supported by the feedback from stakeholders including delivery partners.** One delivery partner noted that "SiG has been the mortar between the bricks and the spark that lit the fuse".

8.1 A key objective of the evaluation is to understand the additionality of the programme: what would have happened to the outcomes observed without SiG (the counterfactual). Our assessment of additionality and the relative contribution of SiG compared to other factors in achieving outcomes is presented below. This is based on evidence from the business survey of beneficiaries, case studies, delivery partners and external stakeholders.

## Additionality

8.2 Table 8-1 presents the results on additionality for 32 respondents to the business survey. From this, we conclude medium outcome additionality for SiG. Around one-quarter of businesses reported that outcomes would not have occurred at all or would have happened anyway but outside the UK (full additionality). There was also strong evidence of speed and scale additionality: over half of businesses reported that outcomes would have occurred at a slower rate without SiG – up to five years, perhaps even longer to realise benefits – and over one-quarter of businesses indicated that outcomes would have occurred at a smaller scale without SiG. A small minority stated that outcomes would have occurred but would not have been of the same quality.

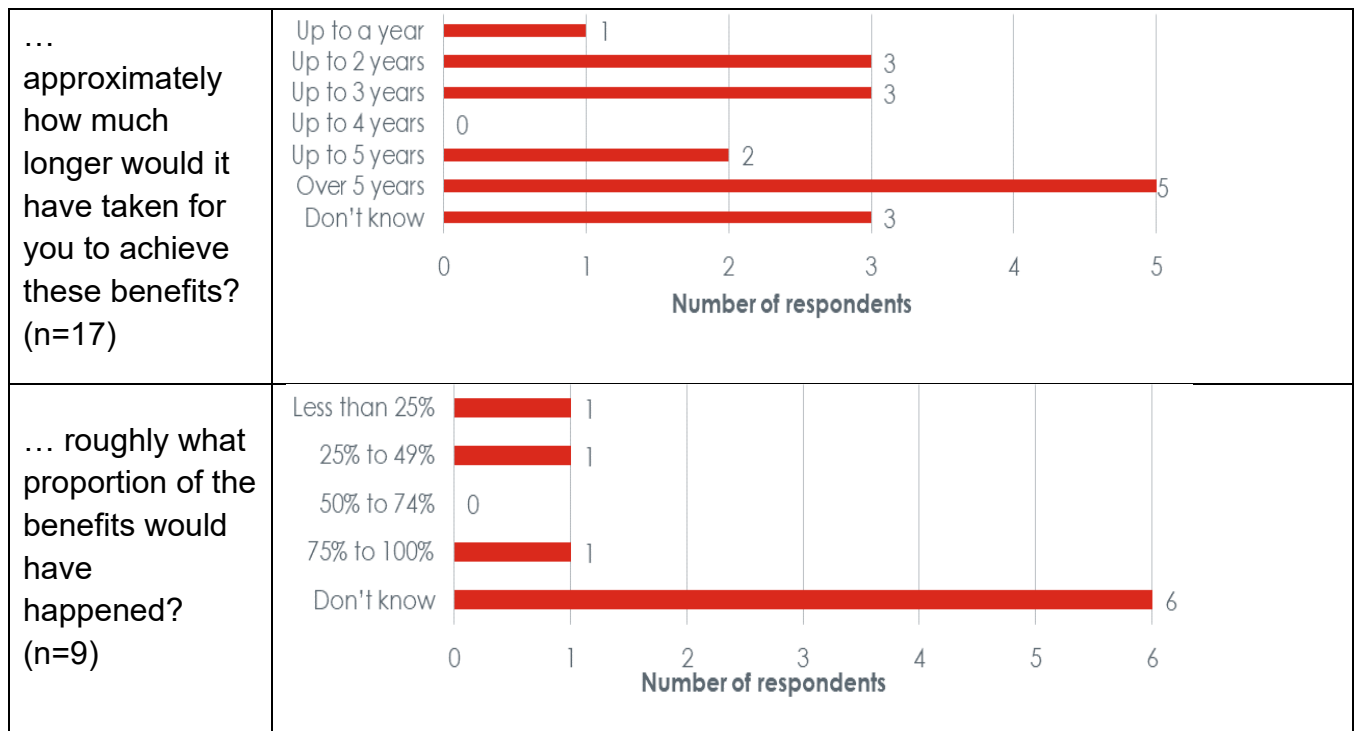
**Table 8-1: What would have happened to the benefits reported without SiG? (n=32)**

Type of additionality		Number of beneficiaries (%)
Full	Would not have occurred at all	8 (25%)
	Would have occurred anyway but outside of the UK	1 (3%)
Partial	Would have occurred but at a slower rate	17 (53%)
	Would have occurred but at a lower scale	9 (28%)
	Would have occurred but not the same quality	4 (13%)
Deadweight	Would have occurred anyway in the UK	2 (6%)

Source: SQW business survey. Note that partial additionality answers are not mutually exclusive, and therefore the percentages do not sum 100.

8.3 Further quantified results for timing and scale additionality and are presented in Figure 8-1.

**Figure 8-1: Without engagement with SiG....**



Source: SQW business survey

- 8.4 The case studies provide further insight into how and why additionality was generated by SiG.
- 8.5 Where case study firms identified full additionality, consultees argued that SiG support provided them with the focus and resources to overcome previously insurmountable barriers to growth, e.g. information failures about how to improve, underinvestment in training, and a lack of affordable alternative support mechanisms.
- 8.6 Where SiG brought about outcomes more quickly than would otherwise have been the case, many case study consultees cited that the key driver was the long-term, intensive (on-site) nature of SiG support. This meant that momentum and discipline was maintained, which prevented business improvement activities from “falling to the bottom of the to do list” or the firms “slipping back into our own ways”. In addition, the diagnostic process provided a structured framework for change, and additional resource from the SiG team enabled firms to progress more quickly than if they were relying on purely (more limited) internal resources.

**Case study examples**

*Full additionality*

Without SiG, the company would have carried on with ‘business as usual’ because there would not have been a framework in place to make changes, nor the resources to implement the changes in the short term and sustain them over the longer term. In addition to the initial diagnostic, the long-term, on-site presence of SiG was particularly

important in enabling these benefits because it allowed SiG to become an extension of the business rather than an 'outsider' and ensured that improvements were sustained.

#### *Timing additionality – Example 1*

Improvements were achieved up to five years more quickly than would otherwise have been possible because SiG provided additional resource and expertise to implement changes. In particular, the SiG support which led to improved employee engagement and empowerment was considered to have played a crucial, if intangible, role. Whilst SiG targets the senior leadership team, the process engages wider staff, and this was important in delivering outcomes and additionality.

#### *Timing additionality – Example 2*

In the absence of the programme, the outcomes would have been achieved but it would have taken up to two years longer without the pace, momentum and discipline provided by SiG. The diagnostic process was particularly important, as this enabled the business to identify inefficiencies within the business. The onsite delivery team was also crucial to embed changes.

## Wider perspectives on additionality

- 8.7 Feedback from external consultees and delivery partners corroborated the findings above in relation to additionality, emphasising full or partial additionality: speed, scale, and to a lesser extent quality. For example:
- Amongst external stakeholders, SiG was most commonly seen as delivering speed and/or scale additionality by acting as a catalyst for change and providing support for firms implementing changes. The role SiG has played in improving the quality and effectiveness of changes made within a firm was also highlighted.
  - Four delivery partners identified examples of full additionality, three reported instances of timing additionality and two highlighted scale additionality.<sup>61</sup> From their perspective, SiG's holistic approach was key to encouraging additionality. They argued that beneficiaries may have implemented some isolated changes without SiG, but SiG support helps the entire business to improve, thus leading to outcomes that are larger in scale. The SiG supported firms benefit from a wide package of support from experts in different areas which better positions the entire company for long-term growth.
- 8.8 Displacement relates to new activity created at the expense of competitors and is often considered in the assessment of additionality. In the survey, most businesses identified that some sales would be taken by UK competitors. We recognise this may well be the case, but do not think this detracts from our overall findings on additionality due to the following reasons:

<sup>61</sup> Two of the eight delivery partners were not able to comment on this question, in one case due to internal staff turnover and in another because the organisation does not keep a central record of how beneficiaries progress after support has ended.

- Competitors may include other beneficiaries from the SiG programme (and may not have been able to compete effectively without SiG support).
- Qualitative feedback from consultees and secondary evidence suggests supply chain firms are competing in an international market, which reduces the risk of displacement effects.
- Innovation is about the creation of new or improved products and services that displaces older "incumbent" ones. The benefits of new or improved products and services will often accrue to the users (consumers or businesses) through the supply chain and will not necessarily be captured by the company producing it. These spillover effects cannot be measured, so it can be misleading to make adjustments only for displacement.

## Developing the ‘contribution story’...

8.9 The above findings suggests that SiG has delivered additional outcomes for beneficiary firms. To strengthen this key finding we set out below further evidence on the contribution of SiG relative to other factors that may have influenced the outcomes reported by business beneficiaries. In doing so, we follow the contribution analysis approach set out in Section 1 and guidance provided in the evaluation literature.<sup>62</sup>

8.10 We first identify other factors – internal and external to businesses – that contributed to the outcomes reported. This is followed by establishing the importance of SiG relative to these factors. Finally, we assess the overall contribution of SiG against the programme’s theory of change. The evidence for developing this ‘contribution story’ is the business beneficiary survey, supported by feedback from case studies and stakeholders where appropriate.

8.11 Table 8-2 presents the results on other factors that may have contributed to outcomes for 33 respondents to the business survey. **The most commonly cited internal factors contributing to outcomes included: new senior management team/business leadership in place (36%), and other R&D activities in the business (21%). In terms of factors external to businesses, around two thirds of respondents (64%) identified market demand and external sector and economic conditions as a contributing factor.**

**Table 8-2: Beneficiary survey: what other factors may have contributed to the outcomes described? (n=33)**

	Factor	Number of respondents
Internal	New senior management team/business leadership in place	12
	Other R&D activities in the business	7
	New equipment purchased	6

<sup>62</sup> For example, Magenta Book (2020) Central Government Guidance on Evaluation

	Existing customer relationships	5
	Pre-existing or new business plan/strategy implemented	3
	Existing internal training programmes	3
	Site expansion	2
External	Market demand and external sector and economic conditions	21
	Technology changes and developments	3
	Regulatory or policy changes	3
	Overarching Aerospace Sector Deal/ATI Strategy	1
	Other funders or organisations e.g. ATI, AGP	0
Other	Other	5

Source: SQW

8.12 The following case study examples illustrate some of the findings from the business survey.

### Case study examples

One business noted the importance of using SiG as part of a wider approach to growth. This included a capital grant from the Local Enterprise Partnership to improve facilities, as well as external support from Innovate UK to enable R&D activity.

A second business also reflected on the importance of R&D. Whilst SiG support allowed the company to implement a new Product Introduction Process, it was internal R&D activity that developed the new products to be launched.

Another business highlighted the contribution made by its internal business improvement programme which predated SiG and included a new factory layout and investment in kit.

The internal drive and desire to improve was noted as important by a fourth business, as were the legacy impacts of skills improvements amongst staff from pre-SiG support.

8.13 The feedback from stakeholders including from SiG delivery partners also identified common contributory factors that generally aligned with the above findings from businesses, although there were a few different factors identified:

- **High quality/more motivated leadership teams** committed to growth, greater willingness/ability to invest in new kit, and the recruitment of technically skilled graduates all contributed to the success of specific businesses.
- **General growth in the aerospace industry** with UK suppliers winning more work partly because there is (or was pre-Covid) more work to be won.
- **Role of other industry organisations and programmes**, in particular ADS, ATI, AGP, and NATEP, Enginuity. It is worth noting that stakeholders placed greater weight on the

role of other industry organisations and programmes compared to business beneficiaries.

- Finally, changes in attitudes to procurement at OEMs and top tier suppliers:
  - One consultee stated that the use of longer term contracts by OEMs, particularly Rolls Royce, gave SiG beneficiaries greater certainty over future volumes of work and more confidence to invest (whether in the provision of kit, people or R&D projects).
  - Another consultee suggested that The Aerospace Supply Chain Charter was beginning to influence procurement decisions pre-Covid.
  - A third consultee noted that even before Covid-19, top tier suppliers were beginning to require a more agile supply chain and had thus put more emphasis on working with UK based SMEs.

8.14 Beneficiary survey respondents also highlighted factors which hindered their ability to deliver benefits from SiG. Unsurprisingly, the Covid-19 pandemic was the most common of these with two thirds of respondents (19) citing it as an influence. The pandemic “substantially” influenced 14 respondents and influenced a further five respondents “to some extent.” Reasons for this included, customers reducing or cancelling orders and the SiG support shifting from on-site to remote which a minority of respondents perceived as being less effective. Dealing with the pandemic also reduced capacity to engage with SiG – “the business has had to focus on day-to-day survival rather than long-term improvements through SiG.” Another respondent noted that SiG has assisted the company’s response to the pandemic through the ‘survive and thrive programme.’

8.15 Other hindering factors are illustrated in the box below, and included access to skills, capital to invest and uncertainty related to Brexit.

### **Case study examples**

One business emphasised that the uncertainty around the existence/contents of a Brexit deal was an unhelpful distraction for the management team. The business reported that UK’s export licensing system was a previous problem which will now be more acute with Brexit.

A second company was hindered because it only has access to a limited pot for capital investment so is not always able to install the latest and most efficient kit which can put the company at a disadvantage compared to competitors.

Skills were a key issue for two companies. The first faced competition from more prestigious/higher paying non-aerospace manufactures in the local economy. Growth in the second is restrained by the specialised nature of some processes which means the company has to train its own staff as there not a wide pool of skilled labour available.



## Role of SiG relative to other factors

- 8.16 Table 8-3 presents the results for 30 respondents to the business survey on the role of SiG contributing to outcomes relative to the factors identified in Table 8-2 above. The results are positive. Nearly three quarter of the businesses considered SiG to be the ‘critical’ contributory factor and as an ‘important contributory factor alongside others’.
- 8.17 This is similar to the feedback from stakeholders and delivery partners which viewed SiG as either critical or as important as other factors to generating firm level outcomes. As one delivery partner noted “SiG has been the mortar between the bricks and the spark that lit the fuse”.

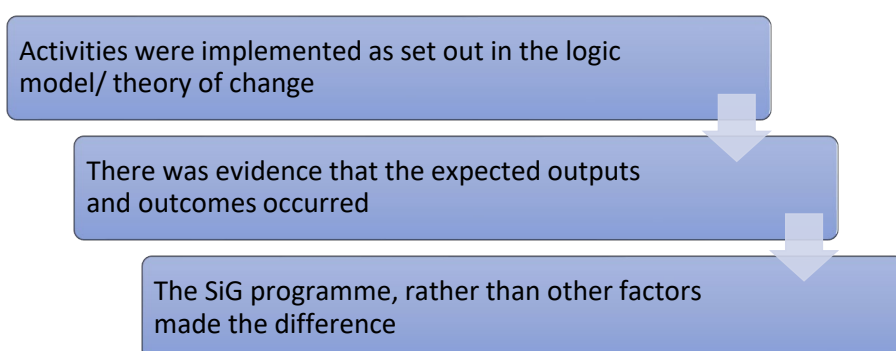
**Table 8-3: Beneficiary survey: What was the role of SiG relative to other factors in delivering outcomes observed (N=30)**

Contribution of SiG	Number of respondents
SiG was the critical contributory factor	12
SiG was an important contributory factor alongside others	10
SiG contributed to outcomes, but was not necessary	5
SiG had no influence	1
Don't know	2

Source: SQW business survey 2020

## Assessment of contribution

- 8.18 This section assesses the contribution of SiG examining whether:<sup>63</sup>



Source: SQW; Mayne (2008)

- 8.19 The assessment is based on the triangulation and analysis of the evidence from the business survey, case studies, stakeholder interviews, and our review of documentation and monitoring data. The findings of the contribution analysis are presented below.

<sup>63</sup> Based on Mayne, J. (2008) Contribution Analysis: An Approach to Exploring Cause and Effect, ILAC Brief 16.

***1: Is there a reasoned theory of change, and have activities been implemented as set out in the theory of change?***

**Overview of findings**

The logic model and underlying theory of change for the SiG programme (including the underpinning drivers and assumptions) exhibit characteristics of a 'complicated' and 'complex' intervention. There is variation in the nature (and duration) of support, intensity of engagement, and delivery model. The programme has multiple components and organisations, and multiple simultaneous and/or alternative causal strands, and emergent outcomes. The routes to impact vary and are often non-linear.

Given this, a reasoned theory of change is evident, and SiG has delivered activities as expected against this depiction. Activities have been delivered over several years in a structured and targeted way to business beneficiaries generally in accordance with how these were expected to be implemented.

**Key evidence**

The business survey and case study evidence found that activities aligned with the rationale for the programme to improve the international competitiveness of UK aerospace supply chain firms – achieve globally competitive standards of costs and performance, and secure high value jobs in economically deprived areas of the UK. This is due to the barriers relating to poor leadership and management practices, operational performance, supply chain management, and lack of investment in innovation.

The activities were appropriate and relevant in addressing market failures and barriers preventing investment and support for training and development (that is longer term, intensive and holistic) targeted at the leadership and management of aerospace suppliers. In particular, on the demand side, the evaluation found evidence of:

- a) information failures relating to the need to improve firm capabilities (from an external perspective) and lack of knowledge about the potential benefits of investment in training and, in some cases, where to access relevant training support.
- b) high levels of risk business face in changing internal processes and bring about transformative change.
- c) underinvestment in training and development partly due to the lack of information on the potential benefits from this, as described above.

The above failures and barriers impede demand for longer-term, intensive and holistic training and development, but the evidence from delivery partners and the business survey suggests that, although there is provision of training and development services from other private sources, these were deemed prohibitively high and unaffordable to SiG beneficiaries due to cost or are not as transformative as SiG (i.e. they only focus on specific area rather than transform the entire business). This was particularly the case

where the scale of support required to achieve transformational change was substantial, which added a “layer of risk” to investment decisions (particularly in firms that lacked evidence on the potential benefits) and was compounded by difficulties in securing external finance for investment in training (compare to capital investment, for example). There is other public provision (e.g. SC21, ATI, NMCL), but the business survey and case study evidence suggests this is not long term and as intensive, and difficult to navigate. The feedback from a minority of stakeholders challenges this perspective.

Overall, the monitoring data, business survey and case studies show a fit between the programmes of activities delivered and those intended, targeting those with lower capability levels at the outset of their SiG journey and providing long-term, intensive and holistic support to firms. The activities have been marketed and delivered across three stages, each involving different timeframes over four years, and multiple SiG staff and external delivery partners: diagnostic assessment (‘Engage’); high intensity support from SiG staff and externally contracted delivery partners (‘Develop’); and ongoing support to ensure training is embedded and leads to improvement for businesses (‘Sustain’).

Collectively, these activities have involved a combination of on-site staff and tailored training, alongside peer-to-peer best practice sharing activities (such as All Star days) and off-site support (e.g. the Team Leader Academy). In addition, activities have included development of resources and promotion activities.

A small minority of business survey respondents highlighted that activities were not sufficiently tailored, prioritised in collaboration or consistent in quality, and the added value had tapered over time. This was corroborated by a small number of case studies. There was also a concern from external stakeholders about whether a long-term, intensive model was appropriate for all of those engaged in SiG and the lack of integration between SiG and wider support.

## ***2: Is there evidence that the expected results have occurred?***

### **Overview of findings**

The activities have translated into key outputs, intermediate and longer-term outcomes. Key outputs include agreements with beneficiaries, delivery of hours of training across all beneficiaries; business diagnostics completed; increased workforce knowledge, skills and capabilities; introduction of new or improved practices and processes; improvements in leadership and management behaviours; new or improved business strategy; increased investment in staff training and development; investments in operational competitiveness. These outcomes have translated into statistically significant increases in employment and turnover for business beneficiaries.

There are also benefits relating to improved productivity and reduced costs, which were not at the expense of staff or their salaries. However, no statistically significant effects were found on wages and productivity. There was also limited evidence of some long-term impacts such as improved aerospace sector strength and resilience (especially in the context of the current Covid-19 economic shock), generation of knowledge spillovers

to those not directly involved in the programme, and increased confidence to base production and manufacturing in the UK.

Overall, the long-term, intense and holistic nature of the SiG funding and support has been key in achieving results. These findings are very positive given a) the long time it takes to embed training and development, change attitudes and behaviours, and to translate these into more 'tangible' effects and b) the pathways to innovation associated with the aerospace and related sectors being very risky and open to global influences.

### **Key evidence**

The monitoring data suggests that activities have translated into key outputs, notably: agreement with 76 beneficiaries and c. 50,000 hours of training received across business beneficiaries. These activities and outputs have translated to a wide range of outcomes, reflecting the programme logic model and theory of change.

In the short term, this includes increased knowledge, skills and capabilities (progressing across the five levels of the Capability Maturity Model); introduction of new and improved management and operational practices, changes in attitudes and behaviours towards investment in training amongst beneficiary firms. The business survey found that the majority were more likely to invest internal funds in leadership and management training in the future as a result of SiG (or had already done so). This is supported by case studies highlighting the nature of training that firms are now willing to invest in, with a shift from primarily technical and operative training to greater investment in leadership and management. In addition, the survey found evidence on value of contracts won and retained, both within and outside of the aerospace sector: 28 out of 33 respondents had experienced observed or expect impacts on contracts in future. Furthermore, the stakeholder evidence generally supports the findings above on skills, competencies and capabilities of business beneficiaries. Beneficiaries also perceive knowledge spillovers across and between the firms supported, and market spillover benefits for their customers and suppliers.

However, whilst beneficiaries were positive about the scope for wider sector impacts, there was mixed evidence from stakeholders on the extent to which SiG had improved skills/spillover benefits for the wider aerospace sector, with a lack of clarity on the mechanisms for this and role and responsibility of SiG in this context.

In the medium to longer-term, the survey evidence suggested SiG is helping firms to widen and diversify their business base: two-thirds of new contracts won and nearly half of contracts retained (by value, where respondents were able to quantify) came from overseas clients. The above outcomes taken together are translating into improvements in business performance in terms of create and safeguard jobs. Around two-thirds of business survey respondents have won or retained contracts due to SiG, and increased turnover and profitability.

The econometric analysis found positive statistically significant employment and turnover effects on beneficiaries. The survey also highlighted reducing costs (22 out of 33

responses), through improved efficiency, cost avoidance, reduced wastage, and improved supply chain management, and improving productivity (24 out of 33).

However, the econometric analysis found not statistical significance on productivity (turnover per employee) and wages (based on data to 2019, noting the fact most firms were still taking part in SiG at the time of the evaluation and the potential lag time before productivity impacts would be observable in the data), and the survey found little evidence of an impact on investment in R&D/new products to market amongst the firms supported.

### ***3: Was it the SiG programme, rather than other influencing factors that made the difference?***

#### **Overview of findings**

There is medium outcome additionality for SiG funding and activities, whereby outcomes have been accelerated, delivered at greater scale, or (to a lesser extent) would not have occurred at all in the absence of SiG. There are other factors contributing to the outcomes described above (e.g. increased knowledge, skills and capabilities; introduction of new practices and process; increased investment; increased employment and turnover). However, the evidence found that the role of SiG in achieving the outcomes relative to these other factors is 'critical' and 'important'.

#### **Key evidence**

In the business survey (32 respondents), around one-quarter reported that outcomes would not have occurred at all or would have happened anyway but outside the UK. For over half of the businesses, outcomes would have occurred at a slower rate without SiG (taking one to five years longer) and for over one-quarter of businesses outcomes would have occurred at a smaller scale without SiG. A very small minority stated that outcomes would have occurred but would not have been of the same quality.

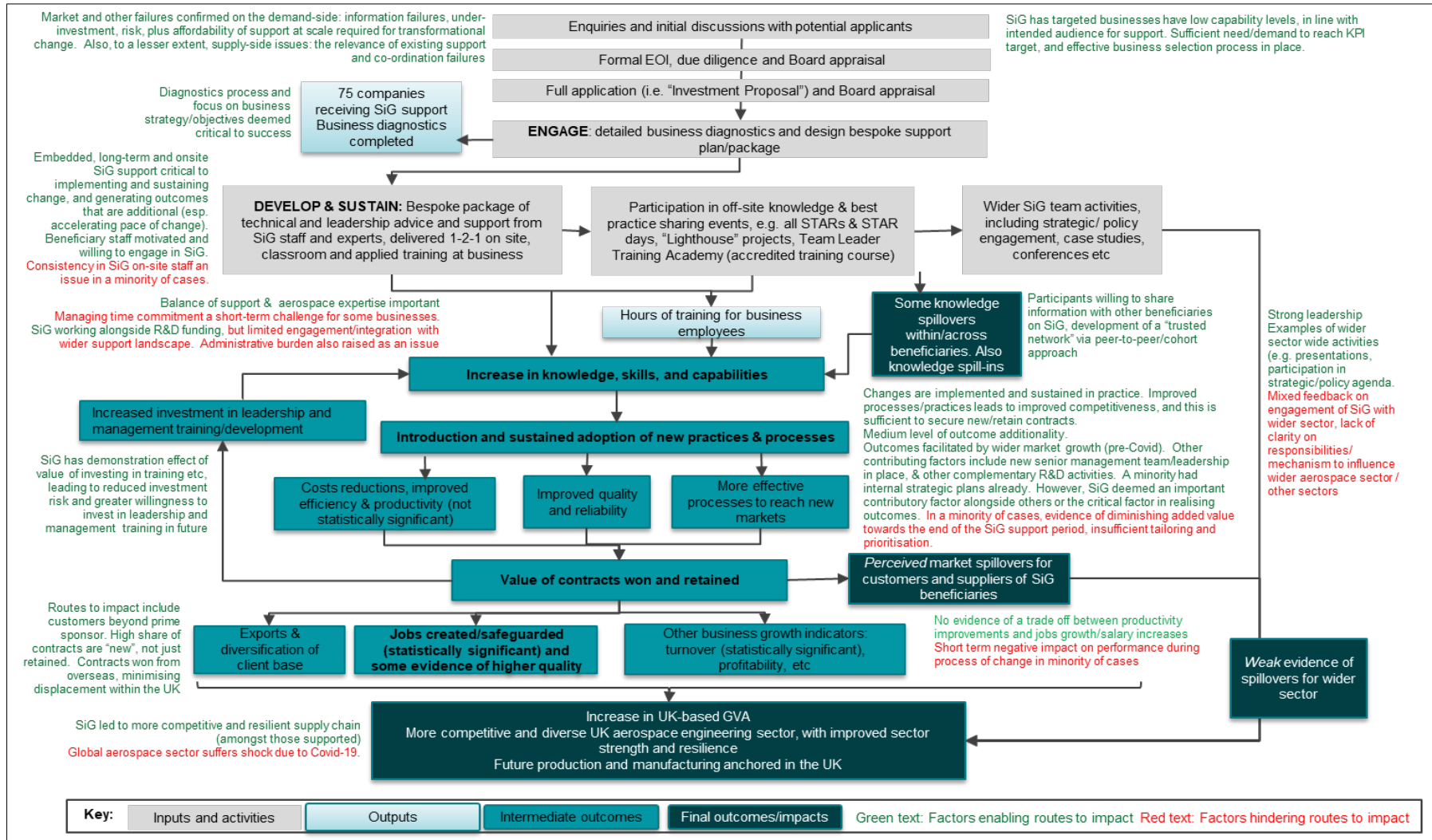
Overall, the feedback from case studies and stakeholders (including delivery partners) generally supported the above findings. SiG's long-term (at least in the initial years), intensive and holistic approach was critical in ensuring that changes were implemented and sustained in the majority of cases (discussed further in the Section below). SiG's high level of resource was important in delivering outcomes at a greater scale; SiG's on-site presence was critical in maintaining momentum and accelerating outcomes; and for those experiencing particularly acute market and other failures preventing change, SiG's support provided much needed resource and expertise to generate changes that would not have been achieved otherwise. Most stakeholders (six out of seven) suggested that without the SiG programme, the outcomes would not have occurred at all, occurred outside the UK, or occurred at a slower rate and would be of lower scale.

The business survey found that nearly three quarters of the businesses considered SiG to be the critical contributory factor or as an important contributory factor alongside others.

The business survey (30 respondents) identified other internal and external factors that contributed to outcomes, notably: new senior management team/business leadership in place (12); other R&D activities in the business (7); new equipment purchased (6); existing customer relationships (5); market demand and external sector and economic conditions (21); technology changes and developments (3).

8.20 Figure 8-2 summarises the contribution story for SiG and how the Theory of Change has been observed in practice, illustrating pathways to outcomes and impact, and factors that have enabled or hindered these.

Figure 8-2: Theory of Change ... in practice



Source: SQW



## 9. Lessons learned

### Key messages

Overall, feedback on the support received was positive, and the large majority of beneficiaries would recommend SiG to other businesses.

The two consistently cited aspects of SiG delivery deemed 'critical' to success were:

- **the initial diagnostics process and focus on business-level strategy/objectives**, particularly in terms of the holistic approach, the role of SiG as a "trusted broker" and, where the process was collaborative, the way in which the process helped to secure buy-in to subsequent changes
- **the embedded and long-term on-site presence of SiG staff**, which has been critical to ensuring that progress and momentum is maintained, and changes are implemented and sustained in practice.

Other strengths of SiG have been the sector-specific nature of support, strong leadership, a balanced offering (i.e. between SiG staff and specific third party support, and between theory/academic training and onsite application), appropriate targeting towards those with the openness and motivation to change, and the facilitation of peer-to-peer knowledge exchange.

The key issue raised with SiG by a minority of consultees was a perception of a "one intensive size fits all" approach, which is not necessarily appropriate or effective for all firms. Linked to this, a minority of beneficiaries felt the added value of support diminished towards the end of the four year period. Whilst there has been a shift away from this more recently to provide more tailored and flexible support, the lessons learned from SiG should inform future programme design.

Other issues raised by beneficiaries included consistency in SiG staff as the programme expanded (which was considered important aspect of the long-term on-site presence), limited evidence of integration with other programmes, and mixed feedback from external stakeholders on the extent to which SiG has engaged effectively with the wider support landscape.

- 9.1 As part of the evaluation, we have explored which aspects of SiG's design and delivery have worked well and been most valuable in generating the outcomes discussed above, and which aspects have worked less well. Whilst this an impact rather than process evaluation, this provides evidence to test the Theory of Change and factors that have helped or hindered routes to impact. We are particularly interested in whether the scale, nature and focus of SiG support (i.e. long-term, holistic and intensive) is critical to delivering intended outcomes.

## What has worked well ... key ‘success factors’

- 9.2 Overall, feedback on the support received was positive: for example, the majority of beneficiaries surveyed (29/33) were either very satisfied or satisfied with their engagement with SiG.
- 9.3 The two most important and consistently cited aspects of SiG that were deemed ‘critical’ to success/impact across the beneficiaries, delivery partners and external stakeholders consulted were **(i) the initial diagnostics process and focus on business-level strategy/objectives and (ii) the embedded and long-term on-site presence of SiG staff**. These are discussed in turn below.

### The initial diagnostics process and focus on business-level strategy/objectives

- 9.4 According to beneficiaries, the initial diagnostic has been critical to success, by identifying challenges (including the scale and pace of change required to remain competitive), opportunities and objectives to focus on and helping to identify relevant SiG support. For example, 21 out of 32 beneficiaries surveyed argued that the initial diagnostics were critical to success, and 23 out of 32 identified support to develop business strategy/objectives as critical (and 11 of these argued this was the most critical aspect of SiG in enabling outcomes to be achieved). External stakeholders also recognised the importance of SiG’s “holistic” and whole firm approach in tackling barriers to growth, and SiG’s role as an external but “trusted broker” to co-ordinate the process of diagnostics, support required and implementation.
- 9.5 Moreover, the case studies highlighted how the diagnostic process (in addition to the results) was equally important for beneficiaries, particularly where this was done in collaboration with SiG, cross-department and in discussion with the wider workforce (as discussed in Section 5). Whilst beneficiaries described the process was “extremely thorough” and “time consuming”, five case study consultees provided more detail on how it provided a clear rationale for implementing change which helped to secured senior and wider workforce buy-in to the process of change, empowered staff, and encouraged accountability (see examples below). Four of the delivery partners also highlighted the importance of the diagnostics phase to encourage the beneficiaries to take ownership of the proposed programme of support and impacts right from the outset. External stakeholders also felt that the process of engaging with SiG was important in building in-house capability (i.e. not just giving them the skills).
- 9.6 This said, there were some issues with the diagnostics process, which are discussed below.

#### Case study example (1)

This consultee argued that the initial SiG diagnostic was crucial to the success of the later phases of support. SiG’s engagement with senior managers from across the business during this process helped to empower staff and create a sense that SiG was working

with them rather than doing things to them. The process also forced the firm to examine aspects of the business, e.g. specific product lines, which had not previously been analysed in such depth and so highlight areas for improvement.

**Case study example (4)**

The initial diagnostic was critical in identifying challenges and opportunities for the main phase of the programme to focus on. The diagnostic was predominantly led by SiG, but involved collaborative input from across the business to identify priority areas for the business. This enabled SiG to develop a tailored programme of support. From the consultee’s perspective, the tailored and diagnostics-driven approach was fundamental to the success of the programme. It led to support which targeted capacity building within the leadership team, as well as business improvement in areas identified as priority, which enabled widespread business improvement and cultural change.

**Embedded and long-term on-site presence of SiG staff**

9.7 In the beneficiary survey, 26 out of 32 respondents argued this was critical to success, and 15 argued it was the most critical factor (see Table 9-1). This was also highlighted as key in five of the case studies, and across the delivery partners and external stakeholders consulted.

**Table 9-1: Critical elements of SiG’s design/delivery for enabling benefits (N=32)**

Aspect of design/delivery	Number of beneficiaries stating it was critical	Number of beneficiaries stating it was the most critical
On-site support from SiG staff based at the business	26	15
Support to develop business strategy/objectives	23	11
Initial diagnostics	21	3
Expert advice from other delivery partners	17	3
Detailed understanding of the business and its people	16	3
Off-site events and training	14	2
SiG’s facilitated network of beneficiaries to share knowledge/best practice	12	2
Targeting and selection processes	5	1
Other	3	1
Don’t know	1	1
Refused	1	1

Source: SQW analysis of beneficiary survey 2020; Results not mutually exclusive

9.8 The on-site support helped SiG staff develop a detailed understanding of the business and its people, which inform recommendations/advice that (on the whole) were

considered relevant to business needs. It has played a key role in “holding firms accountable” and supporting, advising and encouraging during the implementation phase. Beneficiaries described how this was critical to ensure that progress and momentum was maintained, at least in the initial years, and that changes were not only implemented in practice, but also sustained (as one case study consultee noted, in contrast to previous experience of smaller, lighter touch, short-term business improvement practices). Consistency in the on-site SiG staff was also important here.

*“intensive support and ‘handholding’ throughout the process helps firms to implement changes”*  
Stakeholder consultee

9.9 An external stakeholder also commented on the value of sustained involvement of SiG and importance in achieving results, arguing that “with competing demands for management teams, it is easy to let changes slide” and that the structure and ongoing support from SiG was important in maintaining progress. Another stakeholder had observed short term/light touch interventions have a “short sharp shock”, but changes were not sustained in the business, whereas SiG’s regular “checking in” with firms was seen as critical to sustained success.

*“Day-to-day involvement of business coaches - having coaches embedded in the business means that nothing is put ‘of the back burner’ because they hold you to account: ‘you can’t just park it for a period and say you’ll get back to it’”*

Beneficiary survey respondent

9.10 These findings align with the evidence in Section 8 that suggest SiG has played an important role in accelerating the pace of outcomes, compared to what would have been achieved in the absence of support.

### **Case study example (7)**

This consultee argued the onsite SiG staff were able to “hold [the firm] accountable” and ensure that changes were sustained. Prior to SiG, the continuous improvement culture in the firm was lacking discipline: tasks were treated in isolation and changes slipped when employees lacked enthusiasm or direction. This sense of accountability due to SiG enabled continuous improvement to become ingrained into the company resulting in several long-term benefits.

### **Case study example (1)**

The onsite SiG staff were seen as an extension of the firm’s own team rather than an ‘outsider’ and were easily accessible to ask for support and advice. This, coupled with the weekly meetings, kept SiG visible and encouraged staff at the firm to continue their efforts. Also, the long-term nature of support from SiG ensured that changes were implemented and maintained, and that new standards did not drop (in contrast to the firm’s previous experience with smaller, short term business improvement programmes).

## Wider success factors

9.11 In addition to the factors above, other aspects of SiG highlighted as being important to success included:

- **Sector-specific support:** Two external stakeholders argued that sector-specific expertise and understanding of supply chain complexities was really important and resonated with firms in this sector. Also, one external stakeholder commented on the “kudos” associated with taking part in SiG, and how it is seen as a “badge of honour” in the sector. Delivery partners attributed this, in part, to the very high “calibre” of SiG staff, their sector expertise, and having OEM sponsorship.
- **A balanced offering:** Both beneficiaries and delivery partners argued the balance between SiG staff and specific third party support, and between theory/academic training and onsite application were important factors in the programme’s success. Delivery partners highlighted the “collaborative” nature of programme delivery, whereby partners complement one another to provide a fully integrated programme with little overlap between delivery partners.
- **Selection and targeting:** SiG assesses business motivations alongside need as part of the selection process, to focus on those willing and motivated to undergo transformational change. Given the time commitment required to engage with SiG, beneficiaries and delivery partners highlighted motivation as being critical to success. An openness to change was also a key factor in whether the diagnostics process worked well.
- **Facilitating peer-to-peer knowledge exchange:** SiG has encouraged a cohort approach, introducing mechanisms (such as Star Days) to bring beneficiaries together and encourage networking, knowledge exchange, sharing of best practice and collaboration. Both beneficiaries, SiG staff and external stakeholders commented on the value of this. For example, beneficiaries, an external stakeholder and SiG staff had observed collaborative/supplier relationships arising from networks established via SiG. One external stakeholder also argued that the network has played a role in raising the attitudes, ambitions and collective vision of firms involved.
- **Strong leadership:** Both delivery partners and external stakeholders highlighted strong and well networked leadership from the central SiG team.

*“The ability to talk to other peer groups and other companies in the whole SiG fraternity has also assisted and helped in terms of understanding what other businesses are doing”*

Beneficiary survey  
respondent

## What has worked less well

9.12 The key issue highlighted through consultations was the perception of a “**one intensive size fits all**” approach, and how this is not necessarily appropriate or effective for all firms. This point appears to be contradictory to the argument above, where the

diagnostics process (and its whole firm, long-term and intensive approach) was highly valued. However, firms raised concerns with:

- the degree of tailoring of support offered; seven survey respondents found the support too prescriptive, and seven argued some aspects of support were not relevant or applicable to the firm.
- the extent to which the prioritisation process was collaborative and accounted for the capacity/ability of the firm to engage (whilst not an explicit question in the survey, this issue was raised in two case studies). Where this was not the case, it has led to frustration about the need to participate in support that was not deemed relevant, and some disengagement by those involved. One case study expanded on this, and argued they ended up getting support that they did not need, at great expense.
- External stakeholders also raised issues with SiG's model providing a "full fat" option only, and suggested the programme needs to distinguish between assessing (a) if there's a need and (b) whether SiG is most appropriate, cost effective solution.

9.13 Some beneficiaries and delivery partners have seen SiG evolve, with a shift away from the "cookie cutter" or "one size fits all" approach towards more genuine tailoring and flexibility, and this was welcomed. It is important to flag that this tailoring and flexibility is not suggested at the expense of SiG's overarching model of long-term, embedded and intensive support and its associated strengths – rather, there may be scope increase flexibility within this model for most beneficiaries. More recently, SiG has also sought to adapt in response to the changing context. An example of this is SiG's new "survive and thrive" programme, where the support was reconfigured in response to Covid-19 to quickly roll out the essential 'basics' of support to firms that needed it urgently.

### Case study example (3)

This firm felt that the diagnostic process led to a "predefined cure" which the firm did not think was sufficiently tailored and prioritised in relation to its needs. This had implications for the main phase of the programme, where the package of support included elements which the firm considered irrelevant and not aligned with key areas for improvement in its existing strategy. The firm was required to participate in aspects of support they did not consider a priority, which the consultee felt imposed additional financial and time burdens on the firm. It also created a lack of tolerance for support considered irrelevant. This emphasises the importance of collaboration and firm buy-in during the diagnostics and prioritisation process, and the need to adapt the SiG response to take into account their capacity to participate. This firm suggested that SiG adopts a more flexible, open and tailored approach to the diagnostic process, drawing on the firm's own perspectives about key areas for improvement to ensure that time (and financial resources) were targeted at the areas of greatest need.

9.14 The following issues were also raised:

- The **time commitment** required from beneficiary firms, as discussed in Section 5.



- As the programme expanded, some beneficiaries felt there was **less consistency in SiG staff embedded in the firm**, with issues around staff turnover and increasingly variable quality of staff in a minority of cases (see case study example below).
- The level of **administration and paperwork** was raised by five beneficiaries, with one suggesting they were shouldering too much of the administration workload on behalf of the programme.
- Whilst long-term support has been important to ensure changes are implemented and sustained, a minority of beneficiaries felt that **returns diminished over time**, suggesting that a four year intensive programme not necessary/relevant for all participants (including those who highly valued intensive support in the initial years).
- A concern from external stakeholders about the **lack of integration** between SiG and wider support: as one stakeholder argued, it should not be assumed that SiG provides all solutions, and should better co-ordinate with wider support available where appropriate. This links to a wider point raised by stakeholders around the lack of a clear, joined up pathway for firms through the support on offer (both in terms of aerospace specific and generic support).
- Finally, there was mixed feedback from external stakeholders on how effectively SiG has **engaged with external organisations and programmes**, with frustration from five consultees relating to in SiG's ability to communicate and demonstrate tangible impact to OEMs and sector bodies.

#### Case study example (7)

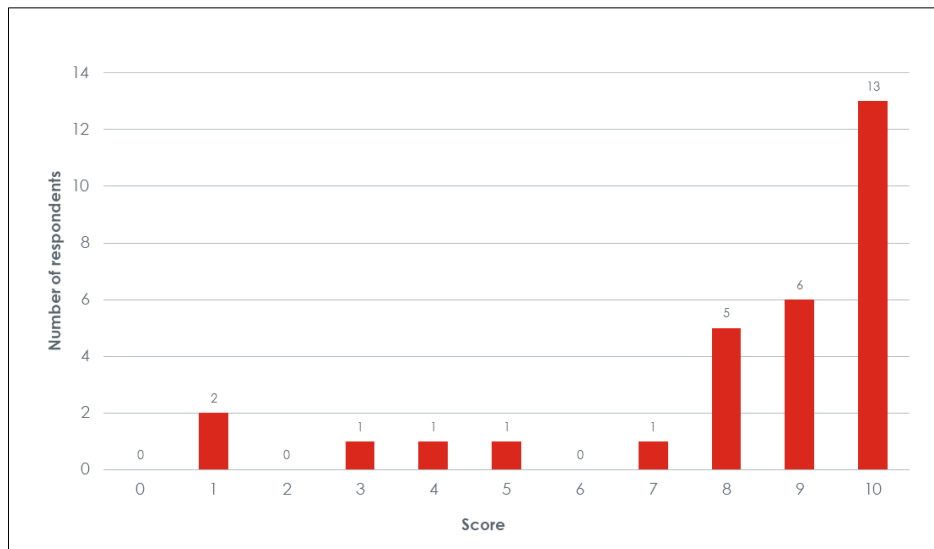
This firm felt there was a decline in the quality of the SiG staff over time. Initially, the firm benefited from the “best engineers” and “all of the enthusiasm”, but as the programme expanded, there was a perception that its resources started to become “stretched” and the “best” engineers with a wealth of experience were replaced with less competent engineers in their on-site team. In addition to having to spend additional time on getting accustomed to a new team, employees at the firm began to question the authority of SiG staff, and so the programme lost its influence. The firm thought this affected their ability to benefit from the programme, and so the majority of positive outcomes were achieved within the first 18 months of support. By the end of the four-year journey, SiG was having a minimal effect.

### Recommendations for improvement

- 9.15 Overall, the majority of feedback on SiG was positive. This was illustrated in the survey where, when asked how likely they were to recommend SiG to other firms, two-fifths of respondents would recommend SiG unreservedly and under one-fifth scored SiG five or lower.



**Figure 9-1: Beneficiary survey results: How likely are you to recommend SiG to other firms on a scale of 0-10 (where 0 is not recommend SiG at all and 10 is recommend SiG unreservedly)**



Source: SQW. N=30

9.16 That said, there was a common theme in the recommendations for improvements made by beneficiaries, delivery partners and external stakeholders: **the need for increased tailoring and flexibility of the programme**. In the survey, 13 respondents identified this as an area for improvement, as did three of the case studies. Other suggestions included ensuring staff consistency (where possible) throughout the duration of support, reducing administration demands, introducing an affordable alumni network, and creating more opportunities to showcase the programme’s successes and for beneficiaries to engage with other sectors to “create more cross-pollination” (e.g. through SiG beneficiaries showcasing their experiences to other sectors).

## 10. Conclusions

- 10.1 The overall purpose of the study was to assess the extent to which the SiG programme resulted in impacts for aerospace supply chain firms in the UK. The evaluation addressed 11 research questions (RQ). The key conclusions relating to each of these questions are presented below. These are informed by our theory-based assessment, involving contribution analysis to test the evidence on outcomes. The main methods included: analysis of programme documentation and monitoring data, business beneficiary interviews, stakeholder and delivery partner interviews, case studies, and econometric analysis. The findings from the evidence gathered were assessed against the programme logic and theory of change.
- 10.2 We highlight the following points with respect to the evidence used and analysis undertaken.
- We received feedback from 33 beneficiaries to the business survey and further insights from eight case study beneficiaries who responded to the survey. The survey population was broadly similar to the wider beneficiary population in terms of size and the timing of when they engaged with the programme. Most of the beneficiaries were still in receipt of SiG support. This is important given the long timescales involved in realising some 'harder' outcomes (e.g. relating to business performance). It is also worth highlighting the potential bias in the self-reported evidence from the survey and case study beneficiaries.
  - The counterfactual and aggregate net impact are assessed through econometric analysis. This was triangulated with self-reported evidence from the beneficiary survey and case studies, and stakeholder interviews. However, due to GDPR restrictions and very few unsuccessful applicants opting into a survey, it was not possible to gather evidence from this cohort of applicants.

### Context and rationale

RQ1: What type of market failures, if any, is the programme addressing? Are these failures still relevant and valid?

- 10.3 The international competitiveness of UK aerospace supply chain firms is adversely affected by not being able to achieve globally competitive standards of costs and performance – the UK has an average cost gap of around 20% across 12 aerospace products compared to global benchmark standards. As a result, the UK's share of the global supply chain is in decline. Alongside this, competitor countries such as France, Germany, Spain and the US provide extensive business funding and support for their aerospace industries. The implication is that UK firms do not operate on a 'level playing field'. Relatedly, there is a need to ensure high value aerospace jobs are not lost to competitor countries. Rather employment is created/ preserved in the UK especially in

economically deprived areas where many aerospace suppliers are located (reflecting the aims of RGF support).

- 10.4 The evidence from stakeholders and delivery partners suggests that the competitive position of the UK relative to other countries was due in part to the sub-optimal business processes, practices, and investment – within UK supply chain firms. This was because of inadequate leadership and management within these firms in terms of their knowledge, skills and capabilities. The business survey and case study evidence found that bespoke, intensive, longer-term, and holistic training and development, for the leadership and management of UK suppliers was needed. However, the evidence from the business survey, case studies, delivery partners and (to a lesser extent) stakeholders, found that market failures and barriers prevented this from occurring.
- 10.5 **The evaluation has identified failures on the demand side:** (i) information failures relating to: the need to improve firm capabilities at management and leadership levels (from an external perspective) and lack of knowledge about the potential benefits of investment in training and, in some cases, where to access relevant training support; (ii) high levels of risk businesses face in changing internal business processes and bring about transformative change, particularly in the aerospace sector where the costs and disruption of changing internal processes are high; (iii) underinvestment in training and development due to the lack of information on the potential benefits of this; (iv) to generate positive externalities through knowledge spillovers, although this was less of a priority from the perspective of businesses.
- 10.6 The above failures and barriers impede demand for longer-term, intensive and holistic training and development, but the evidence from delivery partners and the business survey suggests that, although there is provision of training and development services from other private sources, these were deemed prohibitively expensive, risky, and not as transformative as SiG i.e. they only focussed on specific area(s) rather than transform the entire business. Businesses recognised that the scale and breadth of support required to achieve transformative change was substantial, and this added a “layer of risk” to investment decisions (particularly in firms that lacked evidence on the potential benefits). This was compounded by difficulties in securing external finance for investment in training (compared to e.g. capital investment). **It is worth noting that supply-side failures were evident but less significant for firms.** These issues were raised in relation to the relevance of existing private sector support – in terms of aerospace expertise, the extent to which these tailored for smaller supply chain firms, and challenges in bringing together expertise from different providers to address firm challenges holistically – compared to the SiG offer.
- 10.7 The business survey and case studies found that the above failures and barriers were still relevant and valid. However, there were mixed views amongst stakeholders on the extent to which the rationale was still valid and whether the programme had addressed market failures and barriers. There is strong evidence to suggest SiG addressed information failures for those taking part, particularly in understanding the value of investment in leadership management and training), but issues around the co-

ordination, longevity and critically affordability of support required for transformational change remained, especially in the current economic climate for the aerospace sector. Looking forward, policymakers will need to consider how the affordability challenge could be addressed (e.g. via supply side intervention to increase capacity/competition and lower prices, or demand side financial incentives).

## Inputs and delivery

- 10.8 A total of £84 million of public funds had been disbursed to SiG by the end of December 2020. This had **levered £135 million from the private sector** (this comprised resources from Rolls Royce and in-kind contributions from the beneficiary businesses). **By the end of December 2020, SiG had spent just over £68 million of public funding on programme delivery, entered into an agreement to support 76 businesses.** These beneficiaries had received over 3.8 million hours of training (equivalent to an average of 50,000 hours per business, and exceeding SiG's contractual KPI target).
- 10.9 The evaluation has found **SiG was targeted appropriately**, with the majority of businesses consulted self-reporting low capability levels at the outset of support. This aligns with the original rationale for the programme.
- 10.10 **Feedback on the support received was also largely positive.** Most beneficiaries surveyed (29 out of 33) were either satisfied or very satisfied with their engagement with SiG, and two-fifths of respondents would recommend SiG unreservedly. That said, a small minority (five) were less likely to recommend the programme, and raised issues in managing the significant time commitment required to participate in the programme, consistency in SiG staff, and diminishing returns towards the end of the programme period (see below).

RQ2: How, if at all, do SiG participants interact with other sector specific interventions, particularly with the ATI and NMCL?

- 10.11 **Overall, the evaluation found that SiG followed or worked alongside other public sector support, notably R&D support, but integration with other aerospace sector-specific interventions was limited.**
- 10.12 SiG was designed to work alongside and complement other business support programmes aimed at the aerospace industry (e.g. SC21, NMCL and support from ATI), positioned at the top of a "ladder of progression". The programme was seen as distinctive due to its intensive, long-term, holistic, and co-ordinated approach which was tailored specifically for the aerospace sector. However, this "ladder" could be working more effectively in practice. Across the beneficiaries consulted, there was limited experience of accessing other aerospace support programmes before (5 out of 33 respondents), during (1 respondent) or after SiG (1 respondent). Beneficiaries were more likely to access non-aerospace specific support, with 11 firms doing so before and 10 alongside SiG support, many of whom accessed R&D and innovation funding. There

was also concern from external stakeholders about the lack of integration between SiG and wider support, with the lack of a clear, joined up pathway for firms through the support on offer (both in terms of aerospace specific and generic support). There was also mixed feedback from external stakeholders on how effectively SiG as an entity has engaged with external organisations and programmes.

## Outcomes and impacts

RQ3: To what extent, if at all, has participation in the SiG programme led to improvements in operational competitiveness, leadership behaviours and business strategy for beneficiary businesses?

- 10.13 **There is strong and consistent evidence on the positive impact of SiG on leadership attitudes and behaviours, and business strategy. Despite SiG being targeted at the leadership and management level, it also led to improvements in wider workforce engagement, confidence and behaviour to implement changes within businesses. The large majority of beneficiaries surveyed have introduced new processes and practices, which – combined with changes in leadership and management behaviours – has led to improved operational competitiveness and productivity, reduced costs (as reported by business beneficiaries) and increased turnover (the latter is statistically significant).**
- 10.14 The beneficiary survey found that the large majority of respondents had improved leadership and management behaviours (26 out of 33, 79%) and introduced new or improved processes/practices (26) which includes management and operational practices. There was also strong evidence from beneficiaries, delivery partners and external stakeholders that SiG had encouraged better workforce engagement, greater confidence and a positive cultural shift across the business as a whole. This had taken time to achieve, but was considered absolutely critical in securing workforce openness and buy-in to change, empowering staff with the confidence and ownership to instigate and implement change, and ensuring that changes are sustained over the longer term.
- 10.15 SiG is enabling firms to actually implement change - not just identifying what needs to change and providing the skills to change. Given most respondents were still participating in SiG, it was too early to assess if these changes were sustained, but early signs were encouraging.
- 10.16 As a result, beneficiaries reported reduced costs (for example, through improved efficiency, cost avoidance, reduced wastage, and improved supply chain management), improved productivity (self-defined), reduced variability/improved quality of outputs, and increased turnover. The econometric analysis shows that the impact on turnover is statistically significant, with a net impact estimated at £799m to £1,145m between 2013 and 2019. Productivity impacts, however, were not found to be statistically significant in the econometric analysis in data to 2019, which may reflect the lag time before these impacts are observed in published datasets.

10.17 Performance has been weaker in relation to impacts on R&D investment/innovation and the development of new products/services, although there are mixed views as to whether this was originally intended to be a goal of the programme.

RQ4: To what extent, if at all, has participation in the programme affected the value of contracts won and/or retained?

10.18 **SiG has had a positive impact on contracts won and/or retained across the businesses supported, and this includes exporting to overseas customers. Analysis of the monitoring data found: (i) the programme exceeded its KPI target for contracts won and/or retained; (ii) contract benefits were more broadly spread across the beneficiaries than is typically expected in business support programmes, and (ii) there was considerable lag between the start of support and most businesses observing an impact on contracts.**

10.19 According to the monitoring data, SiG had helped to win or retain contracts worth £5.2 billion by the end of December 2020, exceeding the original targets for the whole programme by 23%. Nearly four fifths of beneficiaries have recorded an impact on contracts. However, the data suggests substantial variation in the scale of contracts won/retained across those participating in the programme, with some 'big wins' and a long tail of beneficiaries for whom the value of contracts won/retained is comparatively small (80% of the contract value is accounted for by 32% of firms). Moreover, the data demonstrates the time lag to impact, whereby most businesses are on the programme for two years before they begin to realise contract benefits.

10.20 The survey findings corroborated the monitoring data, with a similar proportion of respondents (73%) reporting an impact on contracts. This also suggests SiG is helping firms to widen and diversify their business base (including contracts from non-aerospace sectors) and win a substantial proportion of contracts from overseas customers. These outcomes were attributed to the reductions in costs (to reduce prices or make contracts financially viable), improvements in quality and reliability brought about by SiG's support to develop management practices and operational processes.

RQ5: How many additional jobs have been created/safeguarded as a direct result of the programme?

10.21 **The programme has performed strongly in terms of job outcomes: it has exceeded its contractual KPI for jobs created/safeguarded and, according to our econometric analysis, had a statistically significant impact on jobs.**

10.22 As agreed under SiG's contractual agreement with BEIS, the number of jobs created/safeguarded is calculated using the value of contracts attributed to SiG (profiled over their delivery period) and applying an agreed conversion factor to contract values in each year. Based on this approach, by the end of December 2020, the monitoring data shows that gross jobs peaked in 2019, at just over 9,000. By the end of December 2020, the programme had exceeded its targets for the end of the contract period already. It is important to note that this monitoring data refers to 'gross' jobs attributed



to SiG (both direct and on level of indirect jobs), but does not consider issues of additionality/ counterfactual.

- 10.23 To arrive at the number of additional (i.e. net) jobs created/safeguarded as a direct result of SiG, detailed econometric analysis was undertaken, comparing observed outcomes of beneficiaries with the same outcomes for unsupported companies drawn from six different comparison groups. The results suggest that SiG has had a statistically significant impact on employment of beneficiaries, generating approximately 2,500 to 3,495 additional jobs across all beneficiaries between 2013 to 2019.
- 10.24 Primary evidence from the survey also found that SiG support is translating into employment benefits for most firms (79% had observed an impact). Moreover, there does not appear to be a trade-off between productivity improvements/cost reductions and jobs - most firms had achieved both. There was some evidence of increased salaries as staff become more skilled and capable as a result of SiG from the survey and case studies, but in the econometric analysis the impact on wages was not statistically significant.

**RQ6: How, if at all, has participation in the programme affected the competencies and skill level of staff both in beneficiary companies and in the wider sector?**

- 10.25 **The evaluation evidence suggests SiG has led to positive improvements in workforce skills, knowledge and capabilities, and changed attitudes and behaviours towards investment in leadership and management training. However, evidence of skills benefits for the wider sector (beyond those involved directly in SiG) is very limited.**
- 10.26 The beneficiary survey found the large majority of respondents had observed an increase in workforce knowledge and skills (27 out of 33 respondents, 82%). Management and leadership skills were most frequently cited as an area of skills improvement amongst those surveyed (20 respondents, 61%), alongside a range of wider technical skills.
- 10.27 The majority of beneficiaries have also improved their capabilities in business processes and practices as a result of SiG, progressing from ad hoc business practices, to formally defined steps, managed result metrics, and active optimisation of processes (i.e. progressing through the five levels of progress as measured by Capability Maturity Model).
- 10.28 There is also strong evidence to suggest SiG has changed attitudes and behaviours towards the value of investment in leadership and management training by demonstrating tangible benefits, and some beneficiaries are now more willing to pay for private sector support. This aligns closely with the original rationale for support.
- 10.29 The evaluation found very little evidence of a knock-on impact on skills across the wider aerospace sector. Only two of beneficiaries consulted reported that suppliers had



benefited through knowledge and skills transfer (spillovers are discussed in more detail below).

**RQ7: To what extent, if at all, has participation in the SiG programme led to an improvement in performance of the wider UK aerospace supply chain?**

**10.30 Overall, the evaluation evidence is unclear on the extent to which SiG led to improvements in the performance of the wider aerospace supply chain. That said, businesses recognised that the wider aerospace supply chain was more competitive, and to some extent had anchored future production and manufacturing in the UK than would have been the case otherwise. The evidence from external stakeholders was less clear.**

10.31 The business survey found evidence that SiG had led to a more competitive and diverse aerospace engineering sector (18 out of 25 respondents) and had anchored future production and manufacturing in the UK (19 out of 25). This was corroborated by delivery partners who argued that SiG had kept the supply chain activity in the UK (instead of moving to e.g. Asia). However, this was through directly supporting firms, rather than influencing the wider sector.

10.32 A minority of stakeholders were unclear on whether improving the wider aerospace supply chain was the role of SiG, and were unsure of the mechanisms through which wider benefits were expected to happen. There was also mixed feedback on the effectiveness of engagement and partnership working with external stakeholders, which is an important route through which to influence the performance of the wider sector.

**RQ8: To what extent, if at all, has the programme achieved its initial aim of levelling regional unemployment levels?**

**10.33 The evaluation found SiG has been successful in creating/safeguarding jobs. The large majority of jobs are at firms based outside of London and the South East, including in some of the most economically deprived areas of the UK. Given this, SiG has contributed to the levelling up agenda, and reflects the aims of the Regional Growth Fund.**

10.34 Monitoring data shows that 89% of jobs created/retained are outside of London and the South East, with large concentrations in the North West, East Midlands and Northern Ireland. This largely reflects the spatial distribution of aerospace firms and suppliers in the UK. By targeting this sector, the programme has, as a consequence, supported employment in areas targeted by Government's levelling up agenda.

**RQ9: How, if at all, has SiG contributed to promoting innovation in the wider sector, and knowledge spillovers into other sectors?**

**10.35 There was no clear evidence to suggest SiG contributed to promoting innovation in the wider sector. In addition, the evaluation found mixed evidence of perceived knowledge spillover benefits for beneficiaries' customers and suppliers; and to a**

**lesser extent for competitors and collaborators. This evidence on spillovers should be treated with caution.**

- 10.36 The business survey found (16 out of 25 respondents) that SiG had or was expected to, contribute to promoting innovation in the wider aerospace sector. However, there was no consensus amongst external stakeholders or delivery partners on whether SiG was actually (or was intended to) promoting innovation in the wider sector. Critically, there was an expectation that SiG stimulated process rather than product innovation.
- 10.37 It is important to highlight that the evidence on wider benefits/spillovers was based on perceptions that these effects had been achieved or would be achieved over the next few years. It was not possible to verify the evidence from groups reportedly experiencing the benefits (i.e. those not directly engaged with SiG). Notwithstanding this, the business survey (N=30) found indirect benefits had already been achieved for beneficiaries' customers (20), suppliers (13), competitors (4) and collaborators (9) as a result of SiG. There was weaker evidence of benefits for these groups in the next two years. The spillovers were mostly in the aerospace, manufacturing, and materials sectors.
- 10.38 The most common mechanism for generating these spillovers were through knowledge sharing between beneficiaries, developing stronger relationships and networks. SiG had facilitated knowledge spillovers through bringing beneficiaries together and encourage peer-to-peer networking (e.g. STAR days, roundtable sessions for participating CEOs, and the 'cohort approach' to support). Also, SiG staff embedded in multiple firms encouraged 'cross-fertilisation' of ideas and facilitated connections. Market spillovers were also perceived in terms of reduced costs for customers through reduced costs and improved quality of technologies/ products; and greater volume of orders placed by SiG beneficiaries. However, not as much evidence on this was found.
- 10.39 The feedback from delivery partners and most external stakeholders corroborated the findings on knowledge spillovers. The feedback highlighted that the SiG team had created "a trusted network" of firms. They recognised the benefits of SiG's "peer support network" in changing attitudes and raising ambition. That said, a small minority of stakeholders questioned whether SiG had influenced performance of the wider supply chain, with a perception that benefits were primarily focused on the beneficiaries directly involved in the programme and that the programme lacked clear mechanisms through which to generate spillovers.
- 10.40 The business survey found that SiG had encouraged spill-ins of knowledge from other sectors e.g. automotive (21 out of 30 respondents). However, the evidence was not clear on the extent of this.

**RQ10: What unintended consequences, if any, has the programme generated for companies or/and the wider sector?**

- 10.41 **SiG has led to unexpected consequences in a minority of cases: on the downside, short term capacity issues and impacts on business performance; and on the**

**upside, put business in a stronger position to be agile and pivot in response to the challenges faced by Covid-19.**

- 10.42 A minority of stakeholders expressed concern around substantial time commitment required to participate in SiG. Beneficiaries recognised this, but the majority of those surveyed (27 out of 33 respondents, 82%) said this had not prevented them from engaging in other business development or management activities. However, two cases noted 'unexpected' but 'necessary' short-term implications for business performance, particularly during the most intensive phase of engagement and change, prior to gains in the long-run.
- 10.43 Both external stakeholders and beneficiaries commented on the unexpected impact of SiG on business resilience and agility in the context of Covid-19. Changes made as a result of SiG to improve competitiveness had strengthened their position when the sector took a downturn, and enabled pivoting in response to opportunities presented by Covid-19.

**RQ11: What long-term impacts, if any, could be achieved by the programme and how can they best be measured?**

- 10.44 Over the longer-term, SiG could potentially have an ongoing impact on business resilience and agility, particularly during the period of economic recovery, if changes to business processes and operational practices are sustained. Notwithstanding the pandemic, it will also be important to assess whether impacts on jobs and turnover are recovered/sustained going forward. Impacts on productivity will need to be monitored closely; to date, the outcomes suggest a balance has been maintained between turnover and jobs growth, rather than productivity growth at the expense of jobs. Finally, on spillovers, looking forward there is a need for SiG to better define and articulate (and then track) the extent to which SiG generates spillover impacts, including the types of spillovers expected (i.e. market, knowledge, network), how they are expected to occur (i.e. the mechanisms), where they are happening (i.e. customers, collaborators, competitors etc) and when they are expected to be realised.

## Assessment of additionality and contribution

- 10.45 **The evaluation concludes that there is medium outcome additionality associated with the outcomes experienced by businesses participating in the SiG programme. Specifically, there is evidence of full additionality for a minority of businesses and much stronger evidence for speed and scale additionality. SiG has accelerated outcomes and they are of a larger scale than would have been the case otherwise.**
- 10.46 **These findings are positive given business survey respondents were still in receipt of SiG support, and the long timescales associated with outcomes being realised as result of implementing firm level changes to processes and practices in the aerospace sector.**

10.47 The business survey found that for just over one-quarter of beneficiaries (out of 32 respondents) outcomes would not occur at all or would have happened outside the UK. For over half of the businesses, outcomes would have occurred at a slower rate without SiG, and it would have taken up to five years or more to achieve outcomes (17 respondents). Around one-quarter of businesses reported outcomes would have occurred at a smaller scale without SiG; and for a small minority the outcomes would not have been of the same quality (4 respondents). Only two respondents would have achieved the outcomes anyway in the UK.

**Table 10-1: What would have happened to the benefits reported without SiG? (n=32)**

Type of additionality		Number of beneficiaries
Full	Would not have occurred at all	8
	Would have occurred anyway but outside of the UK	1
Partial	Would have occurred but at a slower rate	17
	Would have occurred but at a lower scale	9
	Would have occurred but not the same quality	4
Deadweight	Would have occurred anyway in the UK	2

Source: SQW business survey. Note that partial additionality answers are not mutually exclusive

10.48 Overall, the stakeholder evidence supports the findings of the business survey and case studies. Most stakeholders (6 out of 7) perceived that outcomes would not have occurred at all, occurred outside the UK, or occurred at a slower rate and scale. The majority view amongst stakeholders was that SiG had accelerated outcomes – in line with the results of the business survey.

10.49 The business survey and case studies identified a range of other factors internal and external to business beneficiaries contributing to the outcomes described, notably: new senior management team/business leadership in place; other R&D activities in the business; market demand and external sector and economic conditions; technology changes and developments. **The majority of businesses (22 out of 33 respondents) considered SiG to be the ‘critical’ contributory factor and as an ‘important contributory factor alongside others’.** This positive finding is generally reinforced by stakeholders and delivery partners. As one delivery partner noted “SiG has been the mortar between the bricks and the spark that lit the fuse”.

10.50 **In summary, the evaluation found that the SiG programme has implemented activities as planned and translated these into key outputs, and short- and medium-term outcomes – as set out in the logic model and theory of change.**

## Key lessons learned and reflections

10.51 Overall, SiG has performed well and received positive feedback in relation to the difference it has made for the businesses supported. However, findings are more mixed in relation to wider impacts and spillovers, and engagement with the wider support landscape. In this context, the evaluation has identified a number of key lessons around what has worked well and could be improved to inform future programme design. We reflect on these below:

- First, the two consistently cited aspects of SiG that were deemed ‘critical’ to success were (i) the **initial diagnostics process and focus on business-level strategy/objectives**, particularly in terms of its holistic and (where observed) collaborative approach, and (ii) the **embedded and long-term on-site presence of SiG staff**. This ‘whole firm’ approach has been necessary where transformational change is required, but for most support to achieve this was previously unaffordable and risky (due to information failures).
  - The process of diagnostics has been as important as the findings to secure buy-in and ownership across the businesses involved.
  - Providing the skills and capabilities to implement change has been important, but providing longer-term, on-site support has been absolutely critical in ensuring that progress and momentum is maintained, and changes are actually implemented and sustained in practice.
  - This aligns with the findings that business benefits (e.g. contracts) take time to realise, and that without SiG support they would have taken even longer, been smaller in scale or not achieved at all.
- However, it is important to acknowledge how the distinctive characteristics of the aerospace sector underpin the rationale for this type of intervention and what works in this context, especially given the costs and risks associated with change (as noted above). This is an important consideration in any future discussion by BEIS or others in the wider applicability of the SiG model.
- It is important to highlight **other key aspects of SiG that have enabled routes to impact**, including: the selection process, resulting in the right businesses being supported; the delivery mechanism, including the combination of SiG’s central staff and external delivery partners, leading to sustained demand for SiG; and the “cohort approach” which has encouraged peer-to-peer networking and knowledge spillovers.
- Second, the **evaluation raises questions as to whether the “one intensive size fits all” approach is necessary or appropriate for all**. This includes whether all firms need this level of support to achieve the programme’s aims, notwithstanding the reported ‘blindspots’ in relation to the scale and urgency of scale required. Whilst there is undoubtedly value in the intensive and sustained support from SiG, two issues have arisen in the study:

- the importance of a collaborative approach to diagnostics and the prioritisation of support which acknowledges the beneficiaries' capacity to engage and the importance of buy-in and commitment to the subsequent "engage" phase, and more extensively tailored in response.
  - for a minority of businesses, evidence to suggest the added value of support diminished towards the end of the four year period, suggesting a four year programme is not necessary for all.
  - SiG has sought to move towards more tailored and flexible support more recently. However, reflecting on feedback from consultees on what could be improved looking forward, there may be a need to consider distinguishing between the diagnostics process and subsequent package of support (prior to rolling out the full four years of support) and integrate a greater degree of tailoring and flexibility in this.
  - Third, **SiG could be better integrated with the wider business support landscape**, either in terms of sector-specific programmes that could create a pipeline of candidates for SiG, or in terms of integrating SiG with wider support available during delivery.
  - Fourth, **greater emphasis could be given in programme design and delivery to encouraging wider impacts and spillovers**, and ensuring that mechanisms are in place that enable these to occur. This is essential to ensure that wider social returns (beyond private returns to individual businesses) are maximised, particularly given the fully grant-funded nature of SiG. In this context, we also highlight the following:
    - despite the benefits for businesses supported were very positive, the programme engaged a relatively small number of firms. There is evidence to suggest some knowledge spillovers were occurring within the programme, but there was very limited evidence on spillovers for the wider sector, via beneficiaries themselves or SiG as an entity, and/or via more effective engagement with external stakeholders.
- 10.52 Finally, in response to the original aims for the evaluation and SiG itself, we conclude that the programme has achieved the majority of intended outcomes for those involved, but there is further scope to adjust the SiG model to maximise its effectiveness in the future.

## Annex A: Consultee list

A.1 This annex lists the consultees spoken to as part of the scoping interviews with SiG staff, delivery partners, and external stakeholders.

### SiG staff

**Table A-1: SiG scoping consultees**

Name	Organisation	Position
Andy Page	SiG	CEO
Malcolm James	SiG	Operations Executive
Neil Craythorne	SiG	Finance Manager
David Rose	SiG	Company Secretary

Source: SQW

### Delivery partners

**Table A-1: Delivery partner consultees**

Name	Organisation	Position
Julia Arkell	Deloitte	Client Relationship Director
Alan Hall	Global Integration	Account Director
Simon Forster	Inspire TS Ltd	Director
Liz Salter	Institute for Manufacturing	Industrial Associate
Andy Sargent	Project 7 Consultancy	Principal Consultant
Graeme Young	The Advisory, Conciliation and Arbitration Service	Senior Advisor and Collective Conciliator
Keith Ridgway CBE	The University of Sheffield Advanced Manufacturing Research Centre; University of Strathclyde Advanced Forming Research Centre	Co-Founder of AMRC; Executive Chair of AFRC
Mark Taylor	Shipleys UK	Managing Director

Source: SQW



## External stakeholders

**Table A-1: External stakeholder consultees**

<b>Name</b>	<b>Organisation</b>	<b>Position</b>
Colin Smith	AGP	Chair
Melanie Davies	GE Aviation	Global Sourcing Compliance Leader
Greg Gilbert	Barclays	Head of Credit Analysis
Ann Watson	SEMTA	CEO
Neil Barnett	ADS	Aerospace Director
Balaji Srimoolanathan	AGP	Programme Director
Hugh Clayton	Meggitt	Group Director
Steven Cowan	Senior VP	GKN Aerospace
Colin Turner	South West Regional Aerospace Alliance	CEO
David Barnes	Farnborough Aerospace Consortium	CEO

Source: SQW

# Annex B: Econometric methodology and analysis

## Econometric analysis

- B.1 As part of an impact evaluation of the Sharing in Growth (SiG) programme, we undertook an econometric analysis of the programme's impact. This fed into the overarching mixed-methods evaluation of SiG, for which contribution analysis was used as a framework.
- B.2 In short, the approach attempted to quantify the net impact of SiG by comparing changes in beneficiary performance to those in unsupported companies using a difference-in-differences (DiD) methodology. The findings from this analysis added to the evidence regarding the impact of SiG on outcomes associated with business performance (i.e. employment, turnover), productivity and efficiency, thus addressing research questions 4, 5 and 8 identified in Section 1 of this report.
- B.3 This Annex sets out an overview of the approach and methods used in our econometric analysis, including the methodologies implemented, comparison groups established, the statistical models and specifications estimated, and any assumptions made. Key findings from this analysis are also reported and discussed.
- B.4 Our econometric analysis focused on the effects of SiG support on: a) employment, b) turnover, c) wages, d) turnover per employee (as a proxy for productivity), and e) the ratio of costs of sales to turnover (as an alternative measure of productivity/effectiveness).<sup>64</sup> The results suggest that **SiG had a statistically significant effect on beneficiaries' turnover and employment**. On average:
- B.5 Supported companies were estimated to have employed between 17 and 23 more people during the programme and between 53 and 76 after the end of the programme than they would have employed without the support.
- B.7 These benefits translate into additional 2,501 and 3,496 jobs and £798.8m – £1,144.8m turnover attributable to SiG over the period between 2013 and 2019.<sup>65</sup>

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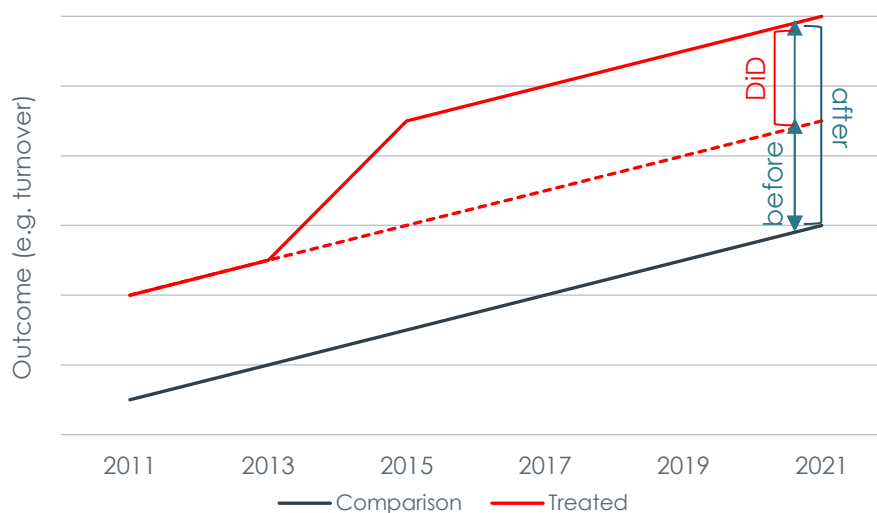
<sup>64</sup> The ratio was used to reflect the fact that costs may be reduced as a result of a decline in sales, and therefore analysing the level of costs would not necessarily provide an objective view of the effects of the programme

<sup>65</sup> Our data on companies' characteristics specifies calendar years. The FE years are assigned to the calendar years which contain the larger part of the FEs. In other words, for almost all companies analysed 2013 refers to 2013/2014 FE, while 2019 is 2019/2020 FE. However, companies may operate using different end points for their FEs, and our dataset does not specify what FE convention each company uses. Therefore in our econometric analysis we report calendar years provided in our dataset.

## Overview of the difference-in-differences approach

- B.8 We estimated the net effects of SiG support on beneficiaries using a difference-in-differences approach. This involved comparing changes in the outcome measures (e.g. turnover) before and after the intervention across supported (the treatment group) and unsupported (the comparison group) businesses. Figure B-1 illustrates the principle.
- B.9 By combining information from different periods in time across the treatment and comparison groups, DiD accounts for time trends – only the changes in outcome measures observed for the treatment group which exceed those observed in the comparison group are attributed to the programme. The DiD estimates of the effect of the programme are also free from the influence of any unobserved firm-specific characteristics, as long as these do not change over time.

**Figure B-1: Illustration of the difference-in-difference (DiD) principle**



Source: SQW

- B.10 A basic DiD model requires data from two periods (before and after the treatment). In this case, the differences in outcomes between the treatment and comparison groups are calculated in both periods and then compared to determine the programme's impact. This version possesses all the main benefits described above but is vulnerable to violation of **the principal assumption behind this approach – the 'parallel trends' assumption.**
- B.11 Under this assumption, in **absence of treatment, the beneficiaries are assumed to follow the same trajectory as firms in the comparison group.** This is a strong assumption and is difficult to test using data only from two periods. If the assumption is violated, the DiD estimate may wrongly attribute effects of external events, such as Brexit, or general economic conditions to the programme (if those effects and conditions affect supported and unsupported companies differently).

B.12 To overcome this issue, we used data which covers the period from 2010 to 2019 (data sources are discussed in more detail below, see Section B.25). This allowed us to undertake a graphical analysis to determine the validity of the parallel trends assumption. It also enabled the use of a more flexible, regression-based model which allowed us to relax this assumption (to a certain degree). The following Sections set out the statistical model used and explore these features in more detail.

## Statistical model of SiG's impact

B.13 When setting up the statistical model we took into consideration the following:

- There is a natural phasing in take up of SiG support – some companies were engaged earlier than others and have already finished the programme while some are still in the relatively early stages.
- SiG support lasts several years, and the full benefits may be realised after the end of the support period.
- External events (e.g. Brexit and Covid-19), could have had a different impact on supported and unsupported companies.

B.14 The overarching model used for statistical analysis was:

$$Y_{it} = \alpha_i + \gamma_t + SiG_i \gamma_t + \beta_1^{DD} D_{it} + \beta_2^{DD} A_{it} + \varepsilon_{it},$$

where:

- $Y_{it}$  is the outcome variable of interest (i.e. either turnover, employment, wages, the ratio of cost of sales to turnover or turnover per worker) for company  $i$  in year  $t$ .
- $D_{it}$  is a variable equal to one when company  $i$  is: a) in the treatment group and, b) in the years in which it received SiG support. Otherwise, the value of this variable is zero. This variable allows the model to capture differences in the outcome measures between supported and unsupported companies in the years during which support is received.
- $A_{it}$  is a variable equal to one when company  $i$  is: a) in the treatment group, and b) in the years after the receipt of SiG support. Otherwise, the value of this variable is zero. This variable allows the model to capture the differences in the outcome measures between supported and unsupported companies in the years following the end of SiG support.
- $\gamma_t$  is a time 'fixed effect'. This is a variable that is equal to one in a given year and zero otherwise. It captures the influence of events that occurred in a particular year and affected all firms in the economy.
- $\alpha_i$  is a firm-specific 'fixed effect'. This is a variable that is equal to one for a given firm and zero otherwise. It captures all observed and unobserved time-invariant differences between individual companies in the treatment and comparison groups prior to treatment.

- $SiG_i$  is a group-specific 'fixed effect'. This is a variable that is equal to one for SiG beneficiaries and zero for the comparison group.
  - $\varepsilon_{it}$  is an error term reflecting the amount by which the observed values of the outcome measures differ from the ones predicted by the model<sup>66</sup>.
- B.15 The main coefficients of interest in the model, which capture the effect of the programme during and after support are  $\beta_1^{DD}$  and  $\beta_2^{DD}$ .
- B.16 This model has several important features:
- **It captures the variation in years in which SiG beneficiaries received treatment, both in terms of timing of support and its duration** recognising that SiG is a tailored programme, that it had a natural phasing in take up (some companies were engaged earlier than others) and that some companies left the programme earlier than others. This also allows the model to isolate the effect of the programme from the effects of external events happening in the economy at different points in time.
  - It differentiates between the 'during' and 'after' treatment periods, capturing the fact that outcomes related to business performance often require several years to fully realise.
  - Interacting the group and time 'fixed effects' (i.e. including the term  $SiG_i\gamma_t$  into the model) enables it to control for potential differences in time trends between the treatment and comparison groups. This reduces our reliance on the parallel trends assumption. Changes in the outcome measures which are associated with differences in the pre-existing group-specific trends were not attributed to the programme.
- B.17 As discussed below, the estimates are based on ten years' worth of data (2010-2019), allowing us to use up to five times more observations than would be involved in a basic two-period difference-in-difference analysis.
- B.18 The model explores the variation in the outcomes not only between the SiG beneficiaries and the control group but also between the SiG beneficiaries treated at different times.
- B.19 As shown in (Goodman-Bacon, 2018)<sup>67</sup>, in settings where timing of treatment is variable, impact estimates obtained from the regression-based specification of the DiD model, as used in our analysis, are in fact a weighted average of all possible 'basic' two-period DiD estimates that can be obtained over the duration of the whole programme, including those comparing companies treated earlier to those treated later.
- B.20 In other words, the DiD model makes comparisons between both the treated and untreated companies, as well as between companies treated at different times.

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<sup>66</sup> In our estimations we used a cluster-robust estimator for standard errors which allows for arbitrary serial-correlation within the error term i.e. the model recognises that if it matches the data for one of the firms particularly well in one year, it is also more likely to match the data for the same firm the following year, and the standard errors should be adjusted for that.

<sup>67</sup> Goodman-Bacon, A., 2018. *Difference-in-differences with variation in treatment timing* (No. w25018). National Bureau of Economic Research.

- B.21 To better understand the proportion of the estimated effect of SiG on outcome variables that is attributed to each comparison, a Bacon decomposition was performed.<sup>68</sup> This revealed that in the results shown below ~90% of the estimated coefficient was attributed to the comparison between SiG beneficiaries and unsupported companies.
- B.22 An additional analysis of obtained coefficients revealed that in our overall estimate of SiG's impact, the weight of comparisons between supported companies and those which did not have SiG support at any time was more than 90%.<sup>69</sup>
- B.23 An alternative approach to relaxing the parallel trends assumption would be to include a continuous group-specific time trend. This would assume monotonicity in pre-existing trends affecting treatment and comparison groups. The  $SiG_i\gamma_t$  term used above does not imply monotonicity and may capture not only pre-existing trends, but also other differences between the treatment and comparison group which may be present in a given year. In our main specification of the model we did not assume monotonicity in the group-specific trend because it is likely that such a major disruption to the economy as Brexit (which has implications for exporting) would have broken any such trend. However, we did perform estimation using a monotonic group-specific trend as a robustness check.
- B.24 The next sub-section describes the data which underpinned our analysis.

## Data sources

- B.25 This analysis drew upon a panel dataset (i.e. containing observation on companies over time) covering the 10 years between 2010 and 2019. This drew upon:
- A list of SiG beneficiaries provided by SiG in April 2020, including organisations that were currently on the programme and had already completed it or had been unsuccessful in their application for support. The treatment group used within this analysis was drawn from this list and included the 73 firms that completed or were currently receiving support.
    - The 73 companies included those which left the programme early. We recognise that those businesses may be considered to be a separate treatment group. To preserve the sample size those companies were included in the analysis alongside the beneficiaries which completed the full programme. However, as mentioned above, the **statistical model used for the analysis accounted for the duration of treatment (as well as its timing)**.

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<sup>68</sup> Andrew Goodman-Bacon & Thomas Goldring & Austin Nichols, 2019. "BACONDECOMP: Stata module to perform a Bacon decomposition of difference-in-differences estimation," Statistical Software Components S458676, Boston College Department of Economics, revised 15 Sep 2019.

<sup>69</sup> The work of Goodman-Bacon is at the frontier of academic research on structure of panel DiD models. Due to software limitations associated with the nature of existing analytical results, Bacon decomposition was performed for a more limited model which did not include group-specific time trends. The results were broadly consistent with the results from our main specification which we present further in this annex. However, because that model was more reliant on the parallel trends assumption, the results of Bacon decomposition were used only as a robustness check and to gain a better understanding of the nature of obtained coefficients (i.e. the relative importance of comparisons between companies supported at different times).

- A list of the ‘Top 100’<sup>70</sup> aerospace supply chain companies provided by BEIS in April 2020.
- The Fame database, by Bureau van Dijk<sup>71</sup> which contains information on business performance of UK companies and is largely based on information firms submit to Companies House.
- The dataset assigns financial years (FYs) to the calendar years which contain the larger part of the FYs. In other words, for most analysed companies, 2013 refers to 2013/2014 FY, while 2019 is 2019/2020 FY. However, companies may operate using different FYs, and our dataset does not specify what FY convention each company uses. Therefore, in our econometric analysis we refer to calendar years.

B.26 Table B-1 sets out all outcome variables of interest within this analysis, as well as the variables that were used to form comparison groups (this process is described in more details below).

**Table B-1: Variables used in econometric analysis**

Outcome variables	Variables used to form comparison groups
Turnover	Company size <sup>72</sup>
Employment	Company age (since incorporation)
Average wages	Profit per employee
Turnover per worker (as a standard proxy for productivity)	Turnover per employee
The ratio of costs of sales to turnover (as an alternative proxy for productivity and business efficiency) <sup>73</sup>	Return to assets
	Average remuneration
	Average growth of turnover and employment between 2010 and 2012
	Risk (ratio of total liabilities to total assets)
	Number of trading addresses
	Number of companies in the corporate group
	Whether the company is an SME
	NUTS region

Source: SQW

B.27 Natural logarithms of turnover were considered to allow the coefficients to be interpreted as percentages (analysis in relative terms is advisable when comparing variables such

<sup>70</sup> Companies included in the list were considered to have the greatest industry relevance and be the largest based on a combination of turnover and employment.

<sup>71</sup> The relevant data was extracted by BEIS and analysed by SQW.

<sup>72</sup> Proxied with the number of employees.

<sup>73</sup> The ratio of costs of sales to turnover compares expenses generated by sales with company’s revenue and can be considered as a measure of business efficiency.



as turnover across companies of different size). This is a common practice which can also improve the model’s properties with respect to distributional assumptions and the parallel trends assumption.

- B.28 Given the mathematical relationship between the level of a variable and its natural logarithm, the parallel trends assumption cannot be strictly satisfied for both. Even though our statistical model relaxes this assumption to a certain degree, we undertook a graphical analysis of turnover, wages and employment to determine whether the levels or log-transformed values were more likely to satisfy it, and therefore more suitable for the analysis. All outcome measures, except for turnover, were modelled in levels.
- B.29 All monetary values included within our analysis were converted to real terms in 2019 prices using the HM Treasury GDP Deflator<sup>74</sup>.
- B.30 The following sub-section explains how comparison groups for the DiD analysis were formed using the data sources described above.

## Identifying a counterfactual

- B.31 The DiD approach allows estimation of the net impact of an intervention by considering a counterfactual position i.e. what would have happened in absence of support. To enhance the robustness of this evaluation’s results, the DiD model set out above (see Section B.14) was estimated using several alternative comparison groups, identified as part of preliminary analysis. These are listed in Table B-2.
- B.32 Propensity Score Matching (PSM) – a statistical matching technique – was used to reduce selection bias<sup>75</sup> when comparing SiG beneficiaries to a wider business population (comparison groups 2-6). This was used to improve the model’s internal and external validity, and further enhance robustness to violations of the parallel trends assumption. The details of this approach are presented in the next sub-section.

**Table B-1: Comparison groups used in analysis**

Comparison groups
‘Top 100’ supply chain companies provided by BEIS in April 2020 <sup>76</sup>
A subgroup of the ‘Top 100’ supply chain companies provided that were most similar to SiG beneficiaries, identified using PSM (one-to-one matching) <sup>77</sup>
A subgroup of all companies falling under an agreed set of SIC codes available on Fame identified using PSM (one-to-one matching) <sup>78</sup>

<sup>74</sup> At the time of analysis the GDP deflator for 2020 was not available. Latest data available at: <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-december-2020-quarterly-national-accounts>

<sup>75</sup> Selection bias is a bias which arises because supported companies may systematically differ on observed and unobserved characteristics from unsupported companies.

<sup>76</sup> The analysis included the information on 90 of these firms which we could identify in Fame.

<sup>77</sup> In total, this included a sample of 44 firms.

<sup>78</sup> This included a sample of 44 firms.

<b>Comparison groups</b>
A subgroup of all companies falling under an agreed set of SIC codes available on Fame, identified using PSM (one-to-many matching) <sup>79</sup>
A subgroup of all companies falling under an agreed set of SIC codes available on Fame, identified using PSM and a reduced set of matching characteristics (one-to-one matching) <sup>80</sup>
A subgroup of all companies falling under an agreed set of SIC codes available on Fame, identified using PSM and a reduced set of matching characteristics <sup>81</sup> (one-to-many matching)

Source: SQW

## Propensity Score Matching

B.33 BPSM is a statistical technique which enables the identification of a comparison group that consists only of companies which have similar observed characteristics to treated companies. In short, this is achieved by:

- First, estimating the likelihood of exposure to treatment of each company based on observed characteristics. The numerical values reflecting the likelihood of treatment are known as propensity scores.
- Second, identifying unsupported businesses with similar propensity scores to those of beneficiaries i.e. which were as likely to receive support as beneficiaries, but did not.

B.34 It is important to note that in this analysis, PSM was not used to directly assess the effect of receiving SiG support (e.g. by comparing outcomes in pairs of companies with most similar propensity scores). Instead, it was used to identify groups of unsupported companies that are similar to SiG beneficiaries, which were then used as a comparison group in the DiD model described above.

B.35 Table B-3 sets out in detail the steps which were carried out to conduct PSM and subsequent impact assessment using the DiD model, with further detail provided below.

**Table B-1: Steps in implementing PSM and DiD analysis**

<b>Step</b>	<b>Description</b>
Step 1	A pool of companies from which comparison groups would be drawn was identified
Step 2	Propensity scores were estimated
Step 3	Six alternative comparison groups were formed based on estimated propensity scores
Step 4	The quality of each comparison group was assessed
Step 5	DiD analysis was undertaken

Source: SQW

<sup>79</sup> This included a sample of 1,773 firms.

<sup>80</sup> This included a sample of 88 firms.

<sup>81</sup> This included a sample of 1661 firms.

**B.36 Step 1: Two pools of companies from which comparison groups would be drawn were identified:**

- The list of ‘Top 100’ supply chain firms.
  - All companies from this list which we were able to find in Fame database were used as one of the comparisons groups (group 1). However, this list contained some very large companies (e.g. Rolls-Royce and Ametek) which arguably may substantially differ from SiG beneficiaries. Therefore, we used PSM to select a subset of the ‘Top 100’ companies which were the most similar to SiG beneficiaries.
- Firms within industries identified by the seven most common standard industrial classification (SIC) codes among SiG beneficiaries.
  - SiG supports aerospace supply chain companies. However, not all beneficiaries are directly involved in manufacturing aircrafts. Therefore, to identify relevant industries a list of relevant SIC codes (presented in Table B-4) including the codes which were primary for at least five SiG beneficiaries was agreed with BEIS.

**Table B-2: List of SIC codes used to identify the pool of potential comparison firms**

SIC code	Short Description
25.66	Treatment and coating of metals
25.99	Manufacture of other fabricated metal products
26.11	Manufacture of electronic components
28.99	Manufacture of other special-purpose machinery
30.30	Manufacture of air and spacecraft and related machinery
32.99	Other manufacturing
71.129	Other engineering activities

Source: Guidance on standard industrial classification of economic activities (SIC)

**B.37 Step 2: propensity scores were estimated:** Estimations were based on data from 2012 i.e. before the start of the programme.

- This approach was chosen (as opposed to using data from the latest pre-treatment period for each company) to rule out any potential differences in observable characteristics of businesses which may arise due to influence of external factors in different years. In other words, similar companies may appear to be quite different if they are compared on data from different points in time.

**B.38** The list of the characteristics used to estimate propensity scores included (also shown above in Table B-1): company size<sup>82</sup> and age (since incorporation), profit per employee, turnover per employee, return to assets, average remuneration, average growth of

<sup>82</sup> Proxied with the number of employees.

turnover and employment between 2010 and 2012, company's level of risk<sup>83</sup>, number of trading addresses, number of companies in the corporate group, NUTS region and whether the company was an SME.

- The list of characteristics used to estimate propensity scores was chosen based on the analysis of available data in Fame for SiG beneficiaries in 2012.

B.39 As a robustness check, propensity scores were also estimated using a reduced set of characteristics, including: number of employees, age since incorporation and nuts region. This was done because:

- Adding growth rates of employment and turnover to the list of characteristics used to estimate the likelihood of treatment can help to achieve parallel pre-treatment trends between the treatment and comparison group. However, there is a risk of capturing companies which may have happened to be overperforming in the period over which the growth rates were calculated but would subsequently revert to their natural growth rates of employment and turnover. This could potentially lead to an overestimate of the effects of the programme.
- Using a subset of available characteristics to estimate propensity scores can help test the sensitivity of results to the choice of characteristics used in analysis.

B.40 **Step 3: Comparison groups were formed based on estimated propensity scores.** We used two alternative matching strategies: a) one-to-one matching, and b) one-to-many matching.

- One-to-one matching using the nearest neighbour algorithm allowed us to construct focussed comparison groups which contained only those unsupported companies which were the most similar to SiG beneficiaries.
  - For each SiG beneficiary included in the estimation of propensity scores an unsupported company with the closest propensity score was added to the comparison group. This approach was used to construct comparison groups 2,3 and 5.
- To increase the sample size, we also formed comparison groups using the widest possible range for one-to-many matching (comparison groups 4 and 6). These included all companies 'on common support' with SiG beneficiaries i.e. all unsupported companies with estimated propensity scores between the lowest and highest propensity scores observed among SiG beneficiaries.
  - In other words, we considered all unsupported companies which were as likely to be supported as the group of SiG beneficiary group, rather than any one particular beneficiary.
- It is also possible to use PSM to create counterfactuals that include the two, three or any number of the closest matched companies to each SiG beneficiary. However, since within the above analysis we have included both extremes of this range (one-to-one

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<sup>83</sup> i.e. a ratio of total liabilities to total assets

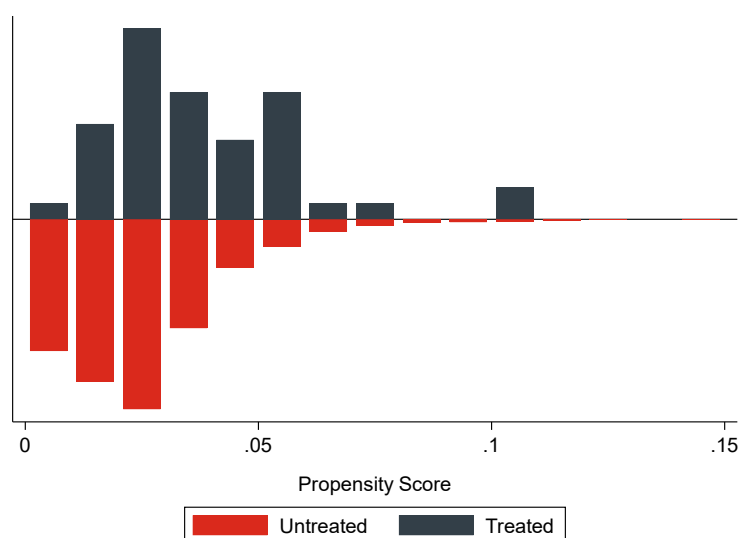
matching vs everyone on common support), it is unlikely that this additional check would significantly affect results.

B.41 **Step 4: the quality of each comparison group was assessed.** We used a combination of graphical analysis and formal statistical tests.

B.42 The distribution of propensity scores for the treated and untreated companies were considered, and the mean values of observable characteristics in both groups were compared.

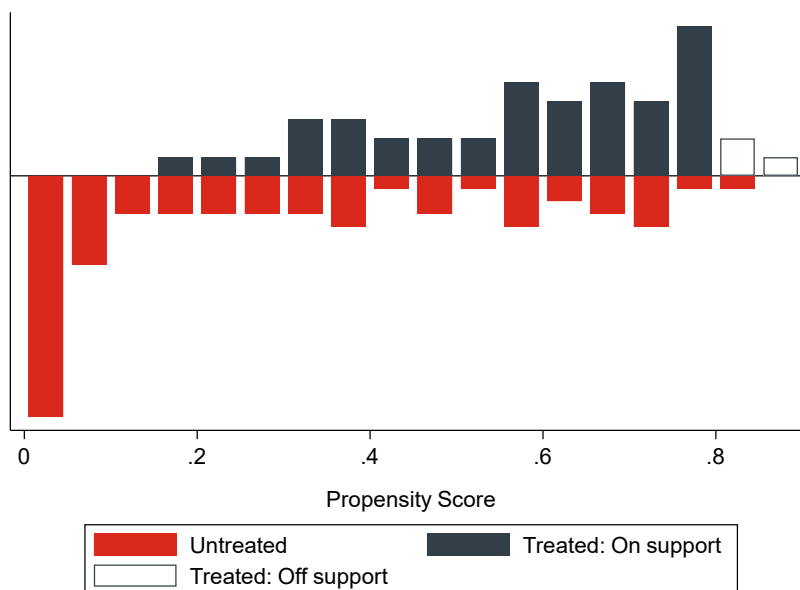
- When considering the wider business population from industries with relevant SIC codes, there is a large overlap in the distributions of propensity scores for supported and unsupported companies (Figure B-2 below). This means that overall, judging by observable characteristics, many of unsupported companies were quite similar to SiG beneficiaries, which further justifies using comparison groups which include all companies on common support.
- When considering the 'Top 100' supply chain companies, there is little overlap at the tails of the distributions of propensity scores (Figure B-3). This suggests that some of the 'Top 100' supply chain companies may not be a good direct comparison for SiG beneficiaries, which provides further justification for using comparison group 2 (based on one-to-one matching of SiG beneficiaries with the most similar 'Top 100' companies).

**Figure B-1: Distribution of propensity scores when matching firms with relevant SIC codes**



Source: SQW

**Figure B-2: Distribution of propensity scores when matching with the 'Top 100' supply chain firms**



Source: SQW

B.43 Table B-5 below sets out summary statistics for each outcome variable, discussed in the following Section.

B.44 **Step 5: DiD analysis.** Once the matching was completed and all six comparison groups formed, the effect of the programme was estimated using the DiD method described above.

B.45 As a robustness check, in a few instances where our analysis at Step 4 indicated any large (more than 10%) and/or statistically significant differences between the treatment and comparison groups on certain characteristics which were not eliminated by PSM, we introduced those variables as additional controls to our DiD model.<sup>84</sup> These did not significantly alter our results or conclusions.

4.46 It is important to note that PSM allows matching based only on observable characteristics. Therefore, the analysis might undesirably attribute some effects of unobservable characteristics which may change over time (e.g. management style) to the intervention. The effect of time-invariant unobservable characteristics is controlled for in our statistical model.

B.47 Also, the sample sizes of each control group varied significantly due to the availability of data on SiG-supported firms within the year chosen for matching (2012). For example, there were only 44 SiG beneficiaries with sufficient data available on matching characteristics in 2012. Therefore, when one-to-one matching was used to identify the counterfactual, only 88 firms in total were included in the analysis. Whereas this is a

<sup>84</sup> The list of such variables includes: average remuneration, turnover per employee, return to total assets, profit per employee and company risk.

relatively small sample, additional specifications that drew upon larger samples were also run. In addition, this analysis drew upon 10 years of data, thus increasing the number of available datapoints.

## Characteristics of businesses in comparison groups

- B.48 Table B-5 below sets out the mean, median and standard deviation of each of the outcome variables considered within this study. Variables are reported across all six comparison groups as well as for SiG beneficiaries before they received SiG support, and after<sup>85</sup>.
- B.49 As anticipated, firms in control groups 1 and 2, which drew upon the list of the 'Top 100' supply chain firms provided by BEIS, perform better in terms of most outcome variables in comparison to SiG beneficiaries. Firms in comparison groups 1 and 2 on average have a higher turnover, number of employees and turnover per employee. The average ratio of cost of sales to turnover and wages across these groups, however, are only marginally greater than those of SiG beneficiaries. In addition, firms in comparison group 2 are on average more similar to SiG beneficiaries on all measures, which is expected since this group includes firms identified through the PSM process detailed above.
- B.50 Comparison groups 3-6, all identified using PSM, perform similarly to SiG beneficiaries on all outcome measures of interest. Average turnover and wages appear relatively higher in groups identified with one-to-many matching (i.e. control groups 4 and 6) compared to SiG beneficiaries than those with one-to-one matching (3 and 5), though differences remain marginal.
- B.51 Table B-5 also provides some initial indication of the benefits of SiG, since within the SiG beneficiary group mean values for all outcome variables increased after SiG support, except for real turnover per employee.
- B.52 The following Section presents the results of our analysis.

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<sup>85</sup> For each beneficiary, only data from years before it received SiG support were included in the 'SiG before' summary statistics, and only data from the years during and after treatment in the 'SiG after' statistics. For control groups, data across all 10 available years were included where possible.



**Table B-1: Summary statistics for SiG beneficiaries before and after receipt of SiG support and firms in all comparison groups**

		SiG Before	SiG After	Control Group 1	Control Group 2	Control Group 3	Control Group 4	Control Group 5	Control Group 6
Real turnover (2019 £th)	Mean	21,748	26,795	165,742	41,230	24,526	27,236	26,354	32,969
	Median	15,243	19,891	50,047	22,514	15,388	14,247	16,308	14,724
	Standard deviation	19,422	23,790	244,376	39,446	26,413	48,302	35,599	75,465
Employment (no. employees)	Mean	154	212	640	220	160	169	173	167
	Median	121	174	265	157	127	103	131	100
	Standard deviation	113	146	1,004	173	117	239	137	244
Real Wages (2019 £th)	Mean	32,942	33,266	38,438	35,397	34,392	34,761	35,338	35,911
	Median	32,534	32,979	36,479	35,295	33,597	32,272	32,188	33,155
	Standard deviation	8,183	6,107	11,356	6,536	8,358	22,497	14,057	22,673
Real turnover per employee (2019 £th)	Mean	173	147	546	176	158	173	140	224
	Median	112	107	179	161	123	136	120	144
	Standard deviation	336	297	1,962	62	121	207	88	465
Real cost of sales to turnover ratio	Mean	0.740	0.748	0.788	0.776	0.715	0.703	0.713	0.704
	Median	0.750	0.745	0.800	0.789	0.717	0.705	0.725	0.708
	Standard deviation	0.121	0.133	0.137	0.095	0.124	0.940	0.131	0.729

Source: SQW

## Results

- B.53 Table B-8 – Table B-12 below present our main results, derived from estimations of our statistical model using alternative comparison groups. Coefficients statistically significant at the 5% level are highlighted green, those significant at the 10% level are highlighted yellow.<sup>86</sup> **Our analysis shows that SiG has had a statistically significant impact on beneficiaries' employment and turnover.**
- B.54 Interestingly, for employment and, in particular, turnover estimates for coefficients increase in magnitude and tend become more strongly statistically significant after SiG treatment, compared with those during treatment. This supports the idea that the impacts of the programme on these outcomes take time to fully come through.
- B.55 At this stage, we could not find a statistically significant effect on average wages or the ratios of costs of sales to turnover and turnover per employee. The observed changes in those measures for SiG beneficiaries do not exceed the changes observed in the comparison groups and therefore cannot be directly attributed to the programme. This may be because it could take longer for productivity/efficiency benefits to be fully reflected in the analysed measures.
- B.56 The coefficients for turnover can be interpreted as percentages: e.g. with the main specification (without a continuous time trend) and when comparison group 2 is used to establish the counterfactual, turnover figures for SiG beneficiaries are on average 11.8% higher during the programme and 32.1% higher after the programme than they would have been without support.
- B.57 The coefficients for average employment can be interpreted as a direct impact of the programme: e.g. with the main specification and when comparison group 2 is used to establish the counterfactual, SiG beneficiaries on average employ 23 more staff during the programme and 68 more staff after the programme than they would have without support.
- B.58 The coefficients for wages, turnover per worker and the ratio of costs to turnover also could be interpreted as direct impacts of the programme on the levels of those measures (though, as discussed above, the effects on those measures are not statistically significant).
- B.59 The estimates for coefficients on outcomes that were found to be statistically significantly different from zero (i.e. employment and turnover) were similar across all specifications. Even where estimates differed, they fell within the estimated 95% confidence intervals. This lends credibility to our findings since **our main conclusions, i.e. that SiG had an effect on turnover and employment, are largely unaffected by**

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<sup>86</sup> The level of statistical significance reflects the probability of being wrong when concluding that the effect is present (the coefficient is not zero). Often the 5% level is taken as the threshold for statistical significance. However, given the complexity of support programmes and potential differences in routes to impact among beneficiaries, we consider results statistically significant at the 10% level to be of policy significance.

**the changes within our statistical model and/or comparison groups used, as described within this Annex.**

## Aggregate estimate of SiG's impact

B.60 As stated above, our analysis showed that SiG has had an impact on employment and turnover within beneficiary firms. Table B-6 below sets out the average per company increase in turnover and employment estimated, as well as the total estimated impacts of SiG on these outcomes across all beneficiaries. Within this:

- Ranges are presented to reflect the variation in results estimated across specifications and using different comparison groups. Ranges are calculated based on the smallest and largest statistically significant estimate obtained.
- Per-company turnover estimates were calculated by multiplying the percentage effects by the mean pre-treatment turnover of SiG beneficiaries, reported in Table B-5 above (£21.7m).<sup>87</sup>

**Table B-1: Estimates for overall impact of SiG on employment and turnover of beneficiaries.**

	<b>Average (per company) increase whilst receiving support relative to comparison groups</b>	<b>Average (per company) increase after receiving support relative to comparison groups</b>	<b>Total net increase across all beneficiaries between 2013-2019</b>
Real Annual Turnover (2019 £m)	£1.6m – £2.8m per year	£5.6m – £7.6m per year	£799m – £1,145m <sup>88</sup> cumulative
Jobs pre-SiG and created/safeguarded as a result of SiG)	17 – 23	53 – 76	2,500 – 3,495

Source: SQW

B.61 Aggregate impacts calculated drew upon data provided by SiG in March 2021 regarding number of beneficiaries supported. This data included dates in which all beneficiaries began and completed their SiG programme. It included a total of 76 beneficiary firms. Whereas this is slightly greater than the 73 firms included within the sample used to conduct this econometric analysis, the average impact values calculated should not be significantly affected. Of the 76 beneficiaries, 33 had completed SiG support by May 2020 and 43 were still ongoing.

B.62 The coefficient that estimates the effect of SiG on employment in beneficiaries after support includes within its estimated impact any jobs created within that firm whilst in

<sup>87</sup> The pre-treatment levels of turnover were averaged across companies and all pre-treatment periods for which the data was available (the number of available pre-treatment periods varied by company). This was done to reflect the volatility (rather than a monotonic growth) in the pre-treatment levels over time, which was revealed through a graphical analysis of pre-existing trends during the assessment of validity of assumptions underpinning the DiD methodology.

<sup>88</sup> The estimated aggregate effect on turnover during support was between £281m – £441m and for after support it was £518m - £703m.

receipt of SiG support. Therefore, the number of total jobs created or safeguarded was estimated by:

- First, multiplying our estimate of the average (per company) number of jobs created whilst in receipt of SiG support by the number of firms reported to currently be in receipt of support (i.e. 43).
- Then, adding this to the multiple of the number of firms that have completed SiG (i.e. 33) and the estimate for the effect after support.
- The estimates of the effect of SiG on turnover reported above are average annual increases in turnover for beneficiaries (i.e. they show the direct percentage increase in annual real turnover resulting from participation in SiG).
- Therefore, to estimate the aggregate effect of SiG on turnover for beneficiaries it is necessary to consider the years for which firms received SiG support (this is typically 4 years) as well as years since completion of support.

B.63 For the latter, data provided by BEIS in March 2021 was used to identify the year in which firms had completed SiG support for each of the 33 firms that had done so at that point, as reported in Table B-7 below.

**Table B-2: Year of completion of SiG programme for SiG beneficiaries**

End year	Number of beneficiaries
2016	5
2017	2
2018	12
2019	9
2020	5

Source: SiG

B.64 Aggregate turnover effect was then calculated by:

- First, multiplying the total number of firms still in receipt of SiG support (i.e. 43) by the number of years for which SiG support was received (assumed to be 4<sup>89</sup>), and the estimated average (per firm) annual increase in turnover during support, as reported in Table B-6.
- This formed the estimate of the total increase in turnover for firms that are receiving support.
- Then, multiplying the estimated average (per firm) annual increase in turnover after support, as reported in Table B-6, by the total number of years since each firm completed the SiG programme.

<sup>89</sup> This is a simplifying assumption as some of SiG beneficiaries have not completed all four years of support at the time of analysis

- This provided the estimate of the total increase in turnover for firms after receiving support, taking into account the variation in the number of years since firms finished the programme.
  - Finally, adding the estimates calculated in the first two steps together.
- B.65 Overall, results of econometric analysis suggest that in the period between 2013 and 2019 SiG directly
- Increased the turnover of its beneficiaries by £799m – £1,145m
  - Created and safeguarded between 2,500 and 3,495 jobs for beneficiaries
- B.66 The estimated effects represent only the direct effect of the SiG programme on beneficiaries. They do not take into account any spillover or other effects on the wider supply chain which may have occurred.
- B.67 The width of the estimated ranges for the effects of SiG support on turnover and employment reflects: a) the variation of outcomes observed among individual beneficiaries, and b) differences in growth observed across the comparison groups. The relatively small sample of supported companies does not allow us to narrow down the range – the confidence intervals around the point estimates are wide and overlap substantially (when compared across model specifications), suggesting that from a statistical point of view the true effect lies within the relatively wide range outlined above.
- B.68 However, based on our analysis of stability of results during robustness checks and taking into account the logic underpinning the choice of comparison groups, we consider groups two and three (one-to-one matching to the list of ‘Top 100’ supply chain companies and companies with relevant SIC codes respectively) to be the strongest. Considering this, the impacts of the programme are likely to be closer to the upper bounds of suggested ranges.

**Table B-3: Coefficients on employment from DiD analyses with all specifications and on all control groups**

Specification and coefficient			Control Group					
			1	2	3	4	5	6
Main specification	During	Coef.	<b>17.7</b>	<b>23.3</b>	<b>20.9</b>	<b>20.9</b>	<b>19.5</b>	<b>19.5</b>
		S.e.	8.3	10.7	10.4	10.2	10.6	10.4
		P-value	0.035	0.033	0.047	0.040	0.069	0.061
	After	Coef.	<b>62.8</b>	<b>68.4</b>	<b>62.3</b>	<b>62.3</b>	<b>53.2</b>	<b>53.2</b>
		S.e.	27.3	29.7	28.9	28.5	32.6	32.0
		P-value	0.023	0.025	0.034	0.029	0.106	0.097
With a continuous group-specific trend	During	Coef.	7.1	<b>22.0</b>	<b>20.1</b>	<b>17.3</b>	<b>18.6</b>	<b>15.3</b>
		S.e.	11.6	10.2	9.8	9.4	10.1	9.7
		P-value	0.542	0.035	0.045	0.067	0.069	0.116
	After	Coef.	<b>75.6</b>	<b>68.9</b>	<b>63.0</b>	<b>64.6</b>	<b>54.8</b>	<b>55.3</b>
		S.e.	27.9	29.0	27.7	26.6	31.3	30.1
		P-value	0.007	0.021	0.025	0.015	0.084	0.066

\*Notes: This tables shows the results from the difference in difference analysis conducted using our main specification for all six control groups as described in detail within this annex. The control groups identified using PSM were matched excluding firms with propensity scores lower than 0.18 (for control group 2) and 0.01 (control group 3-6). The figures reported in bold are the coefficients to the employment variable. Figures not in bold are cluster-robust standard errors. P-values are reported in italics. The level of statistical significance colour coded: green is  $p < 0.05$ , yellow  $p < 0.1$

Source: SQW

**Table B-4: Coefficients on natural logarithm of turnover from DiD analyses with all specifications and on all control groups**

Specification and coefficient			Control Group					
			1	2	3	4	5	6
Main specification	During	Coef.	0.084	0.118	0.095	0.095	0.098	0.098
		S.e.	0.043	0.048	0.049	0.048	0.049	0.049
		P-value	0.055	0.017	0.056	0.049	0.051	0.044
	After	Coef.	0.259	0.321	0.320	0.320	0.332	0.332
		S.e.	0.079	0.079	0.076	0.075	0.084	0.082
		P-value	0.001	0.000	0.000	0.000	0.000	0.000
With a continuous group-specific trend	During	Coef.	0.078	0.108	0.085	0.070	0.087	0.075
		S.e.	0.041	0.047	0.048	0.045	0.048	0.046
		P-value	0.060	0.025	0.076	0.120	0.074	0.099
	After	Coef.	0.277	0.352	0.328	0.299	0.317	0.321
		S.e.	0.076	0.081	0.077	0.075	0.083	0.082
		P-value	0.000	0.000	0.000	0.000	0.000	0.000

\*Notes: This tables shows the results from the difference in difference analysis conducted using our main specification for all six control groups as described in detail within this paper. The control groups identified using PSM were matched excluding firms with propensity scores lower than 0.18 (for control group 2) and 0.01 (control group 3-6). The figures reported in bold are the coefficients to the logarithm of turnover variable. Figures not in bold are cluster-robust standard errors. P-values are reported in italics. The level of statistical significance colour coded: green is  $p < 0.05$  and yellow is  $p < 0.1$

Source: SQW



**Table B-5: Coefficients on average wage from DiD analyses with all specifications and on all control groups**

Specification and coefficient			Control Group					
			1	2	3	4	5	6
Main specification	During	Coef.	<b>1946</b>	1094	1521	1521	1347	1347
		S.e.	<b>1159</b>	1581	1529	1503	1516	1490
		P-value	<b>0.095</b>	0.492	0.323	0.312	0.377	0.366
	After	Coef.	389	-555	862	862	336	336
		S.e.	1509	2099	2112	2077	2106	2070
		P-value	0.797	0.793	0.684	0.678	0.873	0.871
With a continuous group-specific trend	During	Coef.	1755	898	1343	1247	1185	1111
		S.e.	1069	1447	1388	1270	1392	1271
		P-value	0.103	0.537	0.336	0.327	0.397	0.382
	After	Coef.	372	-681	863	385	350	57
		S.e.	1500	2053	2066	2017	2064	2028
	During	P-value	0.804	0.741	0.677	0.849	0.866	0.978

\*Notes: This tables shows the results from the difference in difference analysis conducted using our main specification for all six control groups as described in detail within this paper. The control groups identified using PSM were matched excluding firms with propensity scores lower than 0.18 (for control group 2) and 0.01 (control group 3-6). The figures reported in bold are the coefficients to the average wage variable. Figures not in bold are cluster-robust standard errors. P values are reported in italics. The level of statistical significance colour coded: green is  $p < 0.05$  and yellow is  $p < 0.1$ . Even though one of the coefficients is statistically significant at the 10% level, this finding is not supported by results obtained using alternative comparison groups.

Source: SQW

**Table B-6: Coefficients on cost of sales to turnover from DiD analyses with all specifications and on all control groups**

Specification and coefficient			Control Group					
			1	2	3	4	5	6
Main specification	During	Coef.	0.008	0.007	0.010	0.010	0.011	0.011
		S.e.	0.011	0.015	0.014	0.013	0.014	0.014
		P-value	0.459	0.613	0.485	0.476	0.437	0.426
	After	Coef.	0.011	0.009	0.024	0.024	0.020	0.020
		S.e.	0.019	0.022	0.019	0.019	0.020	0.019
		P-value	0.559	0.680	0.218	0.207	0.304	0.292
With a continuous group-specific trend	During	Coef.	0.009	0.009	0.011	<b>0.027</b>	0.013	0.021
		S.e.	0.011	0.014	0.013	<b>0.016</b>	0.014	0.014
		P-value	0.447	0.514	0.403	<b>0.088</b>	0.370	0.143
	After	Coef.	0.008	-0.002	0.023	0.032	0.020	0.025
		S.e.	0.018	0.021	0.018	0.020	0.018	0.019
		P-value	0.660	0.935	0.203	0.118	0.287	0.178

\*Notes: This tables shows the results from the difference in difference analysis conducted using our main specification for all six control groups as described in detail within this paper. The control groups identified using PSM were matched excluding firms with propensity scores lower than 0.18 (for control group 2) and 0.01 (control group 3-6). The figures reported in bold are the coefficients to the cost of wage to turnover variable. Figures not in bold are cluster-robust standard errors. P values are reported in italics. The level of statistical significance colour coded: green is  $p < 0.05$  and yellow is  $p < 0.1$ . Even though one of the coefficients is statistically significant at the 10% level, this finding is not supported by results obtained using alternative comparison groups and model specifications.

Source: SQW

**Table B-7: Coefficients on turnover per employee from DiD analyses with all specifications and on all control groups**

Specification and coefficient			Control Group					
			1	2	3	4	5	6
Main specification	During	Coef.	5.9	5045.1	2627.1	2627.1	-1307.7	-1307.7
		S.e.	9.0	14678.0	13099.7	12880.5	13695.5	13459.2
		P-value	0.514	0.732	0.842	0.838	0.924	0.923
	After	Coef.	34.3	45239.6	70790.4	70790.4	67590.9	67590.9
		S.e.	35.2	54106.4	59635.1	58637.5	58159.2	57155.5
		P-value	0.330	0.406	0.238	0.228	0.248	0.237
With a continuous group-specific trend	During	Coef.	25.4	-3296.5	678.8	-1197.1	-3301.9	-2095.1
		S.e.	19.8	9597.5	8724.3	7749.1	10048.2	8982.8
		P-value	0.202	0.732	0.938	0.877	0.743	0.816
	After	Coef.	47.1	23373.1	45995.1	19111.8	44261.0	23400.3
		S.e.	30.5	26667.0	35881.5	17141.1	35447.5	16975.8
		P-value	0.124	0.384	0.203	0.265	0.215	0.168

\*Notes: This tables shows the results from the difference in difference analysis conducted using our main specification for all six control groups as described in detail within this paper. The control groups identified using PSM were matched excluding firms with propensity scores lower than 0.18 (for control group 2) and 0.01 (control group 3-6). The figures reported in bold are the coefficients to the turnover per worker variable. Figures not in bold are cluster-robust standard errors. P values are reported in italics. The level of statistical significance colour coded: green is  $p < 0.05$  and yellow is  $p < 0.1$  Figures for comparison group 1 show the effect in £th, whereas for other comparison groups the unit of measurement is £.

Source: SQW

## Annex C: Case study summaries

### Case Study 1

The company is based in the North of England and designs and manufactures lighting systems for both the civil and military aerospace sectors. The majority of its products are exported.

The family-owned company had not kept up to date with advances in manufacturing and management techniques and therefore needed to improve its competitiveness to win more civil aerospace contracts. Prior to SiG, the company had accessed short term private sector support but had not been able to sustain improvements after the support ended. The company therefore engaged with SiG as it wanted a longer-term holistic programme to achieve the process improvements and cultural change necessary to become more competitive in the global market.

The initial SiG diagnostic was crucial to the success of the later phases of support. The process of SiG engagement with the whole senior management team helped to empower staff, whilst the results of the diagnostic highlighted areas for improvement. The company then accessed a wide range of tailored support from SiG: vision and strategy; employee engagement; supply chain management; visual management and new product introduction processes. In addition to SiG, the company also received a capital grant related to its premises and undertook two R&D projects, including one funded by Innovate UK.

The company retained over £8m contracts as a result of the SiG engagement. The whole package of support from SiG contributed to this in a variety of ways – “each individual SiG coach was a piece of the jigsaw” – including improved strategic vision and focus, enhanced employee engagement, and better supply chain management. The company is also now more likely to invest internal funds in future public and private sector training because SiG has demonstrated the positive impacts that training delivered by sector specialists can generate.

The benefits achieved were reported to be fully additional. Without SiG, the company would have carried on with ‘business as usual’ because there would not have been a framework in place to make changes nor the resources to implement the changes in the short term and sustain them over the longer term. In addition to the initial diagnostic, the long term, on-site presence of SiG was particularly important in enabling these benefits because it allowed SiG to become an extension of the business rather than an ‘outsider’ and ensured that improvements were sustained.

This case study illustrates the importance of the on-site nature of the SiG support to delivering sustained benefits. Three improvements were suggested to enhance SiG’s impact: introducing greater flexibility and recognising that the ‘SiG way’ does not always work; reducing the administrative and paperwork requirements on beneficiaries; and

greater support from the central SiG team to grow a peer-to-peer network of beneficiaries.

## **Case Study 2**

The beneficiary is a privately owned, family-run business employing around 550 staff across two sites. The business' engagement with SiG was prompted by a desire to increase efficiencies, in order to support further organic growth. Further, the business sought to diversify into aerospace, but lacked industry expertise. Prior to engaging with SiG, the business attempted to address these challenges by implementing training courses for employees, such as Business Improvement Techniques at L2. However, it became clear that training at senior management level would support the process of efficiency optimisation. Undertaking this process using private consultants alone was prohibitively expensive. SiG's offer of structured support targeted at the board level and delivered by high-calibre partners was therefore appealing. The business hoped to use SiG to increase capacity and skills in order to improve productivity, reduce inefficiencies, minimise waste and diversify into aerospace. SiG also offered opportunities for networking and inter-sector knowledge and skills transfer, which the business hoped would support its diversification.

The Business began the SiG programme in September 2014. The beneficiary was supported by an onsite core team of three individuals from SiG and engaged in external training courses. The SiG experts successfully embedded themselves and brought about positive changes, including addressing inefficiencies identified through the SiG diagnostic process. For example, through operational improvements, the variability of outputs was reduced, and productivity increased. Further, SiG's support enabled cultural and managerial improvements related to communication, leadership behaviours and skills development of both leaders and the wider team. The beneficiary also improved its understanding of the opportunities available in the aerospace industry. SiG therefore contributed to the business' overall growth. However, SiG was highly resource intensive, drawing heavily on middle management. This reduced the firm's performance in some areas where managers had less time to carry out their roles effectively.

The beneficiary estimated that, without SiG, over three quarters of the reported benefits would have occurred anyway (showing a slight scale additionality). SiG was considered to be "part of the jigsaw" in enabling business improvements. Other contributing factors included: the business' desire to change, its ability to innovate and adapt, and its participation in other programmes. It was reported that more benefits could have been achieved if SiG provided more tailored support. Further, benefits may have been enhanced if the programme had been focused on supporting specific parts of the business, and if the firm had dedicated an internal team to the process, reflecting the required time commitment. SiG's relatively limited understanding of the differences between operational requirements in the automotive and aerospace sectors may also have affected their ability to make improvements.

### **Case Study 3**

Part of a global corporation, the business has around 250 employees at a site in the south of England. It designs and manufactures connectors and interconnect systems for the civil and military aerospace markets, plus wider military and marine applications.

The company had developed a strong design capability but had not fully adapted to modern methods such as design for manufacture, leading to weak levels of manufacturing competitiveness. In 2013, the company therefore launched a new strategy to improve productivity and competitiveness. The company recognised the scale of change envisaged in its strategy and therefore embraced the support of SiG, the focus of which perfectly aligned with the company's pre-existing strategy.

The initial diagnostic was described as "fundamentally flawed because it led to a predefined cure" which was insufficiently tailored. Some aspects of the subsequent support were considered relevant and high quality; however, others were considered irrelevant. In addition, the business had limited capacity to engage with SiG because of the demands of its own improvement programme. Due to these capacity constraints and differences in opinion on priorities, SiG support was paused for a year. When the company returned, SiG provided more tailored support, e.g. finding a technology expert, and this change in approach was valued. However, the company formally withdrew early from SiG because it did not believe the programme was delivering the expected benefits in a cost-effective way.

Overall SiG had a positive impact on the company. Specific benefits related to a clearer strategy on future product range, using the results of personality testing to inform inhouse team building activities, and improved process control due to the support from the technology expert. These informed inhouse efforts to implement the company's own strategy. Although SiG indirectly contributed to company growth it was not considered necessary. Indeed, it was reported that SiG was not a cost-efficient way of supporting company growth because the SiG support was not sufficiently tailored, leading to wasted efforted.

This experience highlights two key lessons. Firstly, the importance of the selection process to ensure that participating companies have sufficient time to commit to the full SiG programme and are at the right stage of development. Secondly, that a more flexible approach to the diagnostic process which draws on the business' own perspectives about key areas for improvement would be beneficial to ensure that time (and financial resources) are targeted at the areas of greatest need.

### **Case Study 4**

The beneficiary is an engineering service provider specialising in design and manufacturing solutions for customers predominantly in the aerospace sector. In 2013,

the firm refocussed its strategy on growth and increasing market share. It recognised that it would need to change the business culture, improve operational performance and increase its overall competitiveness. Previous support programmes that the company had accessed could not bring about the step-change required due to their “light touch” and “prescriptive” nature. The intensity of SiG therefore appealed, as did the high-quality resources and experts it provided – the level of which would not have been affordable to the beneficiary in the absence of the programme.

The initial phase of support was the business diagnostics. This was predominantly led by SiG but also involved collaborative input from across the business. The outputs from the diagnostics enabled SiG to develop a tailored programme of support, which included workshops, coaching and formal training. Support was delivered through a combination of an onsite SiG team and external training providers. The former also played a role in holding the firm accountable for the support received. The focus of the support was initially on the firm’s leadership, it then shifted down the organisation to team leaders and finally to shop floor teams. Latterly, the programme focused on translating these improvements into tangible business growth.

The first outcome to the business was operational improvement. This was enabled by the implementation of Lean techniques and, relatedly, more effective management and leadership practices e.g. visual management. Operational improvements led to a reduction in business costs and more competitive pricing, resulting in new contract wins. Over time, a shift in company culture was also achieved. The targeted leadership training at the start of the programme helped develop the understanding of the need for change. Then, as the programme progressed and its benefits became more tangible, the consultee reflected that there was a notable improvement in the business towards a high performing, ambitious and modern culture. This, in turn, resulted in more collaborative work and therefore to spillover benefits in the wider aerospace industry. HAP’s customers also benefitted indirectly due to its improved delivery performance and lower costs, enabling a more strategic relationship to form.

SiG improved the pace, scale and quality of business improvements described above. In particular, the strong focus of the programme on supporting and targeting the development of the leadership team facilitated a widespread cultural shift. However, it was also noted that the beneficiary would have benefited from more change management training to ease the company through such a significant transformation.

### **Case Study 5**

The firm is a specialist manufacturing company specialising in the production of machined components and assemblies for aerospace companies. When applying to SiG, the firm had plans for an internal growth programme, with phase one including a move to new purpose-built premises. Whilst this presented a significant growth opportunity, careful planning was required to ensure a successful move. The firm required training



and support in all areas addressed by SiG, including factory layout, process automation, employee appraisal and motivation.

Prior to engaging with SiG, the firm had received public support from a predecessor of the current SC21 programme and Local Enterprise Partnership grants. The firm had also sought private support from consultants, with costs deemed prohibitive. In contrast, SiG provided the right type of support at an affordable level for an SME, offering a uniquely intensive approach which would enable the firm to revisit principles and strategy before progressing to implementing changes.

The firm started on the programme in July 2014. Throughout, it was supported by a head coach based within the factory alongside other members of SiG staff, with the presence of a coach noted as critical in keeping the firm on track. The initial diagnostic enabled the firm to reflect on performance and identify support requirements. Two other programme elements were identified as important: workforce training; and developing strategic company objectives and vision.

SiG staff successfully embedded themselves within the firm, bringing about positive changes. This included various cultural and managerial changes, with key examples linked to communication, operations and strategy. Operational changes led to improvements in productivity and accelerated business growth (with an increase in both turnover and employment). SiG also helped to develop the firm's workforce, increasing knowledge, skills and capabilities. More widely, engagement with SiG has led to spillover benefits to suppliers (increased purchases), customers (improved delivery quality), collaborators (new connections and collaborations) and competitors (sharing best practice).

Without SiG support, the reported benefits are unlikely to have occurred because the firm faced barriers to finance and would not have been able to access similar support elsewhere. Overall, the firm had a positive experience with the programme, with key strengths including the reflective and intensive nature of the programme. However, it was noted that success on SiG is dependent on commitment to transformation within the business. Potential areas for improvement included increased expertise in planning systems amongst the SiG team; affordability of the alumni network; increased cross-sector learning; and the potential for Team Leader training beyond SiG.

### **Case Study 6**

The company is based in the North of England and designs and manufactures precision sheet metal fabrications, mainly for the aerospace industry. The majority of its products are exported.

The company engaged with SiG to tackle the barriers that were preventing it from scaling. This included the management culture and specific performance challenges on KPIs such

as on time delivery and right first time quality. The company did not have the internal capacity to implement an in-house business improvement programme so engaged with SiG to access additional expertise and resources in a structured way that would leave a long term legacy.

Based on the results of the effective diagnostic process, SiG support was prioritised for five areas: leadership, new product introduction, Sales, Inventory and Operations Planning (SIOPs), lean and quality. SiG became an extension of the company and the weekly meetings and reporting schedule are now part of business as usual processes. This tight management and ongoing communication meant the support was well structured and could adapt as the company needs changed throughout the SiG programmes, including in responding to Covid-19 when the company lost c. 30% of its workforce due to orders being delayed/cancelled. SiG activities targeted the senior leadership team, but the process also engaged wider staff, and this was important in delivering outcomes. The intensive nature of SiG meant that the company did not have the capacity to engage with other public or private sector sources of support. This was not a problem because the SiG support covered all the areas the business wanted to improve in.

SiG support has allowed the company to retain several multi-million pound aerospace contracts as well as to successfully diversify by winning new contracts in sectors including nuclear and pharmaceuticals. The underpinning improvements in employee engagement, production efficiency, on-time delivery, defining a company vision and new product introduction processes were achieved up to five years more quickly than would otherwise have been possible because SiG provided additional resource and expertise to implement changes.

Overall, the company is very satisfied with the support received from SiG to date. The company will continue with its own apprenticeship programme but now plans to invest internal resources in external leadership and management training too. This case study illustrates the benefits that can be achieved when an organisation engages with SiG and is open to implementing changes. The SiG support on defining company values and employee engagement were both considered to have played a crucial, if intangible, role in the company's growth.

### **Case Study 7**

The beneficiary is a leading manufacturer of precision engineered aerospace products, which, at the time of joining SiG in 2013, employed 350 people at its site in the East Midlands. Prior to this, the company had worked in partnership with Rolls Royce to improve its processes as part of the Journey to Excellence, and had been undergoing substantial growth through acquisition activity. It was recognised by the beneficiary that, for this growth to be successful and sustainable, considerable changes were required in terms of the business culture and strategy. Private support had been ruled out due to the

unfeasible expense (and associated risk) and the difficulty in obtaining specialist knowledge. SiG provided a solution to these supply side issues by providing affordable support with a specific aerospace focus. The firm aimed to use SiG to upskill its staff and generate operational improvements in order to increase its efficiency and productivity, with the overarching objective of improving competitiveness.

The initial diagnostics phase effectively highlighted key areas for improvement and was crucial to the beneficiary's success on the programme. The ensuing support was delivered in parallel by an onsite team and externally provided training sessions. These sessions covered various themes including leadership and management, business strategy and operational competitiveness. Importantly, the onsite team brought a sense of accountability which enabled the ethos of continuous improvement to become ingrained into the company.

In line with the company's aims for the programme, SiG successfully contributed to an improvement in workforce knowledge and skills, particularly with regards to communication and manufacturing best practice. This upskilling led not only to higher salaries for staff, but also highlighted how much could be achieved through investment in training. Consequently, the company now invests more heavily in its own team. Furthermore, SiG facilitated operational improvements, such as the introduction of a new pipe assembly system. Alongside other changes, this improved the overall efficiency of the shop floor which, in turn, led to increases in productivity, turnover and profitability. In the absence of the programme, the outcomes would have been achieved but it would have taken up to two years longer without the focus, momentum and discipline provided by SiG. The initial diagnostic phase and the sense of accountability were therefore particularly critical in enabling benefits to be achieved.

Whilst the beneficiary's overall experience of the programme was positive, there was a perceived decline in the quality of the SiG staff as the programme went on, which affected its ability to bring about meaningful improvements. Furthermore, some of the training sessions were considered to be irrelevant for the company and a more tailored approach would have maximised the efficiency of resource use.

### **Case Study 8**

The firm is a leading manufacturing company, specialising in the production of microwave tubes, high voltage power supplies and transmitters. When applying to SiG, the firm was undergoing a change in management and had identified the need for significant cultural change to improve its operations. However, the firm was struggling with capacity to implement the changes alongside day-to-day work commitments. SiG's oversight and support was an opportunity to reduce pressure on the firm's management team, making this transformation more manageable. The firm required training and support in almost all areas addressed by the SiG programme, including leadership and management, employee engagement, and operational processes.

Before and during SiG, the firm received public support through various Innovate UK's Knowledge Transfer Partnership projects, which addressed the firm's technical and research activities. The firm had also sought private support from consultants, which was viewed as short term and less supportive, with suggested changes not seen through. In contrast, SiG provided embedded support, including coaching, encouragement and monitoring to ensure changes were implemented.

The firm started the programme in September 2014. Throughout, it was supported by SiG staff embedded in the team at the factory, with their own office space in the building, with the presence of SiG staff noted as key in ensuring progression. The initial diagnostic helped to set the scene enabling the firm to reflect on all aspects of the business and identify support requirements. Four other programme elements were identified as important: strategic training, management training, employee engagement and training; and support with operational improvements.

SiG staff successfully embedded themselves within the firm, bringing about positive outcomes. This included various cultural, managerial, strategic and operational changes, with key examples linked to communication, operations, planning and strategy. Operational changes led to improvements in overall productivity and business growth (with an increase in both turnover and employment). SiG also helped to develop the firm's workforce, increasing engagement, knowledge, skills and capabilities. More widely, engagement with SiG has led to spillover benefits to suppliers (increased purchases), and customers (improved delivery quality), whilst knowledge spilling in from other sectors, namely automotive, and peers on the SiG programme was noted as a further benefit.

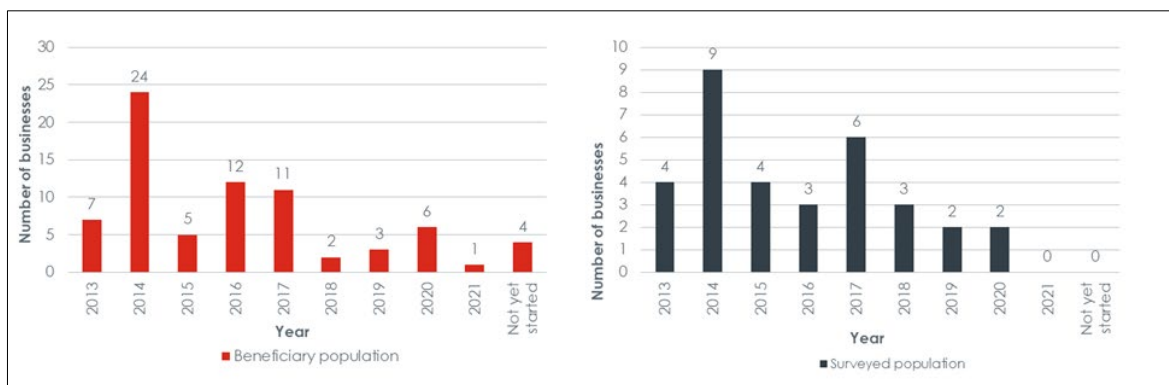
Without SiG support, the reported benefits are unlikely to have occurred to the same speed and scale because the firm would not have been able to access the various support and training activities they did. Other contributory factors included market demand and favourable economic conditions, and technology changes and developments which helped to enable the commercial outcomes. Relative to these, SiG was considered an important contributory factor.

The firm had a positive experience with the programme, with key strengths relating to the embedded nature of the support, including SiG's role in holding the business accountable. The "big challenge" for the business will be to ensure changes are sustained after programme completion in mid-2021. Further, the firm recognised that cultural change takes a long time embed within a business, and so SiG's support may lead to further benefits in the future. Potential areas for improvement include increased tailoring of activities to individual companies and maintaining consistency in individuals within the SiG team. However, this may have been linked to the growth of the programme in its early phases, with feedback having already been taken on board by SiG.

# Annex D: Detailed survey analysis

- D.1 This annex sets out the full analysis of the survey of SiG beneficiaries. In total, 33 beneficiaries were interviewed between September and November 2020. The interviews focused on obtaining evidence on the activities delivered through SiG and any resulting benefits of the programme to participating firms alongside the influence it has had on the wider aerospace sector. The questionnaire was initially piloted with six beneficiaries and was found to be too long. It was subsequently streamlined and, in some instances, those who participated in the pilot did not answer all of the revised questions. Data was taken, where possible, from the pilot questionnaire to inform the final results.
- D.2 In total, 33 businesses were consulted representing 44% of the beneficiary population<sup>90</sup>. The sample group is broadly representative of the wider population in terms of start date, with 2014 being the most common year to begin the programme (Figure D-1).

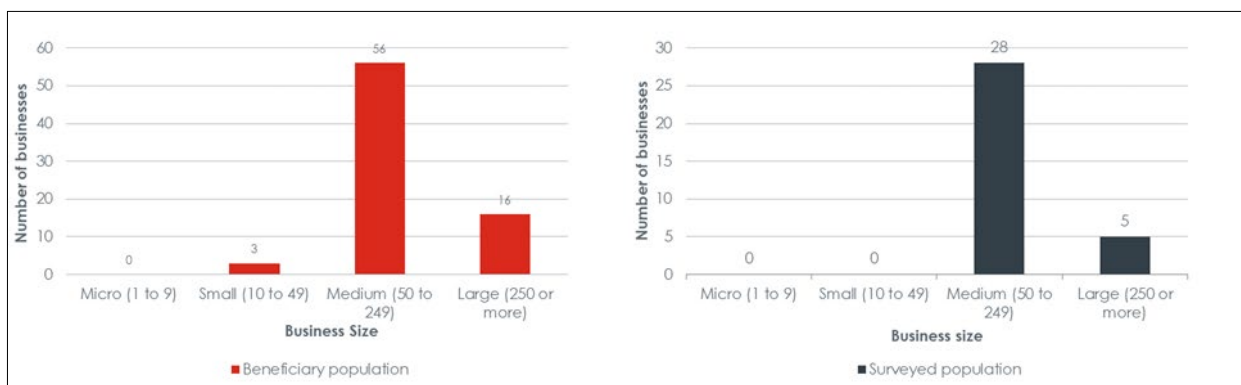
**Figure D-1: Comparison of beneficiary population to surveyed population – start date**



Source: SQW analysis of monitoring data and survey results

- D.3 The sample group is also representative of the wider beneficiary population in terms of business size, with the majority of the beneficiary and surveyed population being medium in size and a small proportion being large (Figure D-2).

**Figure D-2: Comparison of beneficiary population to surveyed population – business size**

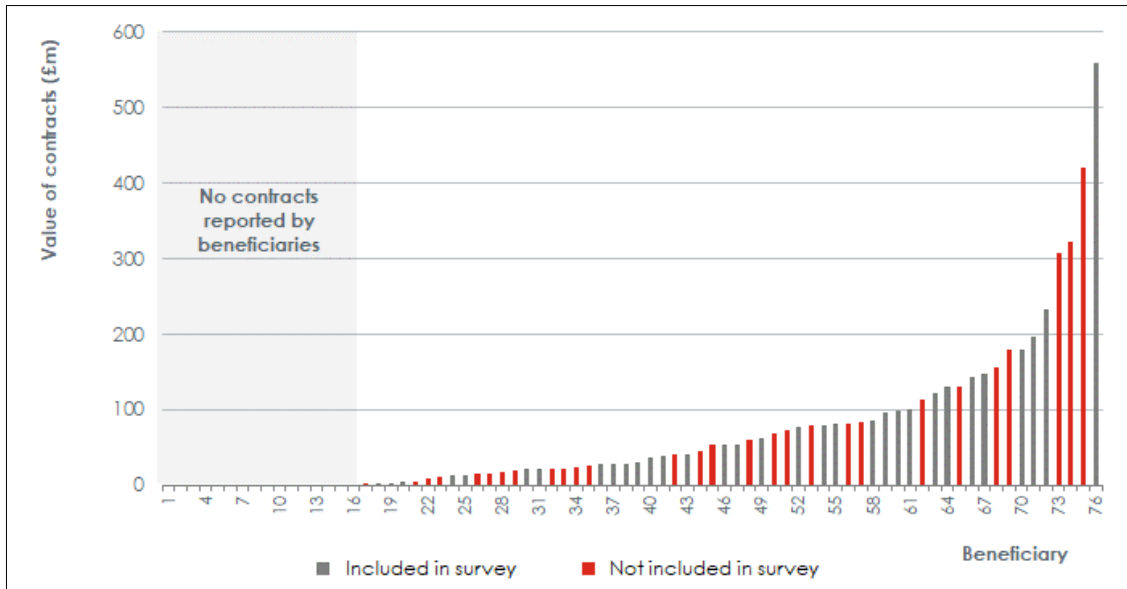


Source: SQW analysis of monitoring data and survey results

<sup>90</sup> Beneficiary population taken to be 75 (76 total but one no longer trading).

D.4 As shown below, the value of new/retained contracts attributed to SiG by each beneficiary firm consulted (according to MI data) is spread across the distribution of contract values.

**Figure D 2: Distribution of new/retained contracts by value**



Source: SQW based on SiG monitoring data

## Engagement with SiG

### Status of engagement with SiG

D.5 The majority of businesses (20/33, 61%) were actively engaged in the SiG programme at the time of interview, with full approval. 10/33 businesses (30%) had completed the programme either fully or partially.

**Table D-1: Status of engagement with SiG (N=33)**

	Number of respondents
Active - full approval	20
Active – diagnostic	3
Active – due diligence	0
Completed – full programme	6
Completed – only part of programme, engagement stopped before full four years	4
Total	33

Source: SQW analysis of SiG beneficiary survey 2020

### Thinking back, when did you begin to receive support from SiG?

D.6 In terms of when businesses began to receive support from SiG, this was evenly spread from 2013 through to the latest in 2020. The distribution of start dates is similar to the full beneficiary population.

**Table D-2: Year SiG support began (N=33)**

	Number of respondents
2013	4
2014	9
2015	4
2016	3
2017	6
2018	3
2019	2
2020	1
Don't know	1
Total	33

Source: SQW analysis of beneficiary survey 2020

### And when did that support finish?

D.7 Support was ongoing for the majority of businesses (25/33, 76%) with the remainder having stopped receiving support between 2017 and 2019.

**Table D-3: Year SiG support finished (N=33)**

	Number of respondents
2017	2
2018	3
2019	3
Support is ongoing	25
Total	33

Source: SQW analysis of beneficiary survey 2020

### If support is ongoing - When do you expect the support to finish?

D.8 Of the 25 businesses for which support is ongoing, expected finish dates ranged from 2020 to 2025. One respondent could not say when they expected the support to finish.

D.9 Across this and the previous question, a total of six consultees reported that their support had been extended, with a seventh business indicating that their support had been paused at the time of interview as a result of Covid-19.



**Table D-4: Year SiG support is expected to finish (N=25)**

	Number of respondents
2020	4
2021	13
2022	2
2023	3
2025	2
Don't know	1
Total	25

Source: SQW analysis of beneficiary survey 2020. N=25, respondents that indicated support is ongoing

## Motivations

### What best describes your initial motivation for engaging with SiG? Tick all that apply.

- D.10 The most common motivations for engaging with SiG were to 'Improve workforce capabilities' and to 'Increase productivity', both with 28/33 respondents (85%), whilst the least common was to 'Remove barriers to investing in R&D and innovation', mentioned by 5/33 (15%).
- D.11 Of the "other" responses, a range of themes could be identified, including to facilitate cultural change, to improve operational performance, productivity and competitiveness, to improve management skills and to enter new markets.

**Table D-1: Initial motivations for engaging with SiG (N=33)**

	Number of respondents
Improve workforce knowledge and skills	19
Improve workforce capabilities	27
Secure new and/or retain contracts	22
Create and/or safeguard high value jobs	16
Remove barriers to investing in R&D and innovation	5
Increase productivity	28
Increase competitiveness	24
Other	10

Source: SQW analysis of beneficiary survey 2020; Results not mutually exclusive

### Why did you need public sector support to address these issues?

- D.12 The need for financial support in order to identify and implement improvements was the most frequently cited reason, mentioned by 14/33 respondents (42%). Another factor

identified by a large proportion (13/33, 39%) of respondents was the in-house lack of knowledge, expertise or capabilities to transform the business.

**Table D-2: Reasons behind need for public sector support (N=33)**

	Number of respondents
Financial support	14
Lack of knowledge/ expertise/ capabilities to transform business in house	13
Best available option	4
Best available option	4
Programme structure	2
Dedicated support	2
Not available privately	2
Attempting to gain aerospace contacts/knowledge	1
Not involved in application	1
Size of business	1

Source: SQW analysis of beneficiary survey 2020; Results not mutually exclusive. Categories determined based on coding of open responses.

## Activities

### Which of the following types of support and advice did you receive through SiG?

D.13 Almost all businesses (29/33, 88%) had completed the initial business diagnostic as part of SiG, with other popular activities including operational competitiveness (27/33, 82%) and leadership and management (26/33, 79%).

**Table D-1: Support and advice received through SiG (N=33)**

	Yes	Partly	Yes (but to a lesser extent)
Initial business diagnostic	29	0	0
Operational competitiveness	27	0	2
Leadership and management	26	0	0
Business strategy	24	1	0
Off-site training/development courses	22	0	0
Supply chain	20	0	0
Annual business review	19	0	0
Group knowledge/best practice activities	15	0	0
Accounting and financial management	14	1	2

Source: SQW analysis of beneficiary survey 2020; Results not mutually exclusive

### How regular was the engagement with SiG, including the external delivery partners?

D.14 The majority of beneficiaries (24/33, 73%) reported that engagement with SiG was daily during the programme.

**Table D-2: Frequency of engagement with SiG (N=33)**

	Number of respondents
Daily	24
Weekly	8
Monthly	0
Don't know	1
Total	33

Source: SQW analysis of beneficiary survey 2020

### Did this level of engagement change over time?

D.15 Almost half (14/33, 42%) of beneficiaries reported that the level of engagement with SiG decreased over time, with a further 9/33 (27%) stating that it fluctuated over time but with no clear pattern.

**Table D-3: Level of engagement over time (N=33)**

	Number of respondents
No	8
Yes – increased over time	1
Yes – decreased over time	14
Yes – fluctuated over time but no clear pattern	9
NA (too early to say)	1
Total	33

Source: SQW analysis of beneficiary survey 2020

### Prior to your engagement with SiG, had your business procured / accessed this type of support commercially?

D.16 Prior to engaging with SiG, an almost equal proportion of businesses had procured/accessed this type of support commercially (15/33, 45%) as had not (14/33, 42%).

**Table D-4: Previous commercial support procured/accessed (N=32)**

	Number of respondents
Yes	15
No	14

	Number of respondents
Don't know	4
Total	33

Source: SQW analysis of beneficiary survey 2020. N=32, 1 no response

**If no, why not?**

D.17 A range of reasons were identified, with the most popular being that the cost was prohibitive, that it was not required, and that it was not previously a priority.

**Table D-5: Reasons behind not accessing commercial support (N=10)**

	Number of respondents
Cost prohibitive	4
Not required	2
Not a priority	2
None available	1
Poor quality	1
Unsure who to go to	1
Other	1

Source: SQW analysis of beneficiary survey 2020; Results are not mutually exclusive. N=10, of 14 respondents who had not accessed support before, four no response

**In the year prior to engaging with SiG, did your business receive any other public sector support?**

D.18 13/33 (39%) of the businesses had received other public sector support in the year prior to engaging with SiG, with a similar proportion having not.

**Table D-6: Other public sector support in year prior to engaging with SiG (N=33)**

	Number of respondents
Yes	13
No	17
Don't know	3
Total	33

Source: SQW analysis of beneficiary survey 2020

**If yes, please specify what support you received from the list below (tick all that apply)**

D.19 Two respondents had received support through the SC21 Operational Excellence programme, whilst two had completed NATEP and one had received ATI funding. From the eleven beneficiaries who selected 'other' in question 12, a range of support was identified, with only Innovate UK funding noted by more than one respondent.

**Table D-7: Public sector support received in year prior to engagement with SiG (N=13)**

	Number of respondents
SC21 Lite – for small and medium-sized companies to start on their SC21 improvement journey (introduced in 2012)	0
SC21 Operational Excellence (OE) – Improve operational effectiveness and achieve supply chain excellence (introduced in 2006)	2
SC21 Competitiveness & Growth (C&G) – Increase competitiveness and improve organisational capability (introduced in 2019)	0
National Aerospace Technology Exploitation Programme (NATEP, introduced in 2013)	1
ATI (Aerospace Technology Institute) funding (introduced in 2013)	2
NMCL - National Manufacturing Competitiveness Levels (introduced in 2016)	0
Other Prime/Tier 1 specific programmes like UTC Gold. Note to SQW - some of the Primes/Tier 1's in the aerospace sector have their own supply chain development programmes.	0
Other (please specify)	11

Source: SQW analysis of beneficiary survey 2020; Results not mutually exclusive. N=13, businesses who had accessed other public sector support in the year prior to engaging with SiG

**Table D-8: Other public sector support received in year prior to engagement with SiG (N=11)**

	Number of respondents
Innovate UK funding	2
Scottish Enterprise training	1
Innovate UK Knowledge Transfer Partnerships	1
Knowledge Transfer Platform	1
Innovus - nuclear R&D funding	1
Expert Programme	1
APC Funding	1
Local Council Grand Funding	1
Rolls Royce's Journey to Process Excellence programme (JTP)	1
Invest NI support	1
North West Aerospace Alliance	1
Original SC21 programme in 2010	1

Source: SQW analysis of beneficiary survey 2020; Results not mutually exclusive. N=11, beneficiaries who selected "other" forms of support

**At the same time you received SiG support, has your business received any other public sector support?**

D.20 Approximately two thirds of respondents (21/33, 64%) had received other public sector support at the same time as they received SiG support.

**Table D-9: Public sector support received during engagement with SiG (N=33)**

	Number of respondents
Yes	11
No	21
Don't know	1
Total	33

Source: SQW analysis of beneficiary survey 2020. N=32, one no response

**If yes, please specify what support you received from the list below**

D.21 Of the eleven who indicated they had received other public support in question 13, one reported that they had completed the National Aerospace Technology Exploitation Programme, whilst the remainder identified a range of 'other' sources of support.

**Table D-10: Public sector support received during engagement with SiG (N=11)**

	Number of respondents
Innovate UK funding	3
R&D Tax Credits	3
Scottish Enterprise training	2
National Aerospace Technology Exploitation Programme	1
Innovate UK Knowledge Transfer Partnerships	1
Business Improvement Techniques Programme	1
Advanced Manufacturing Supply Chain Initiative	1
Other public R&D funding	1
Patent boxes (rewarded for IP and technology)	1

Source: SQW analysis of beneficiary survey 2020; Results not mutually exclusive. N=11, respondents who received other public support during engagement

**[For completed only] After SiG support ended, has your business received any other public sector support?**

D.22 Of the seven beneficiaries who had completed their SiG support, one reported that they had received other public sector support since their SiG support ended.

**Table D-11: Public sector support received since engagement with SiG (N=7)**

	Number of respondents
Yes	1
No	6
Don't know	0
Total	7

Source: SQW analysis of beneficiary survey 2020. N=7, beneficiaries that have completed programme.

**If yes, please specify what support you received from the list below**

D.23 The one business that answered Yes in Q15 reported having received support from the NMCL - National Manufacturing Competitiveness Levels programme and more widely through R&D tax credits.

**How does SiG align and compare with the other support provision described –does SiG offer something unique or different?**

D.24 Two main themes were identified in terms of how SiG is unique in comparison to the other support provision described by beneficiaries: the intensity and embedded nature of support provided by SiG, mentioned by 8/22 (36%) and the fact that SiG is a distinct transformation programme with a rounded approach, mentioned by 9/22 (41%).

**Table D-12: Unique elements of SiG (N=22)**

	Number of respondents
SiG support is intense and embedded within the organisation	8
SiG is a transformation programme with a rounded approach	9
SiG is an aerospace specific programme	1
Other	4
Not applicable	10
Don't know	1

Source: SQW analysis of beneficiary survey 2020; Results not mutually exclusive. N=22, those who had accessed other support before/during/after SiG support. Categories determined based on coding of open responses.

## Overall feedback on SiG support

**Which aspects of SiG support have you found most valuable, and why is this?**

D.25 A range of aspects of support were identified as being most valuable.



**Table D-1: Most valuable aspects of SiG support (N=33)**

	Number of respondents
Understanding of performance and financial data, monitoring and forecasting	8
Leadership and management activities	8
SiG programme support	5
Business Diagnostic	5
SiG expertise	4
On site presence of SiG staff	4
Business strategy and business development activities	4
Third party support	2
Engagement with workforce on the shop floor	2
HR/Personnel activities	1
SiG programme governance	1
Balance of theory and academic training with onsite application	1
Network of SiG beneficiaries	1
Other	5
Don't know	1

Source: SQW analysis of beneficiary survey 2020; Results not mutually exclusive. N=33. Categories determined based on coding of open responses.

### Which aspects of SiG support have you found least valuable, and why is this?

D.26 A range of aspects of SiG support were identified by beneficiaries as being least valuable.

**Table D-2: Least valuable aspects of SiG support (N=30)**

	Number of respondents
Some programme elements not applicable or relevant to business	7
Programme too prescriptive	7
Level of administration tasks and paperwork	5
Some company requirements beyond SiG's expertise/offer	7
Some elements of programme have not delivered as expected	4
Time commitment	1
Top-down approach rather than bottom-up	1
Turnover of SiG staff	1
Onsite SiG staff unhelpful	1
Don't know	1
Nothing identified	2

Source: SQW analysis of beneficiary survey 2020; Results not mutually exclusive. N=30, three no response. Categories determined based on coding of open responses.

### Overall, how satisfied or dissatisfied are you with your engagement with SiG?

D.27 Overall, the majority of beneficiaries (29/33, 88%) were either very satisfied or satisfied with their engagement with SiG.

**Table D-3: Overall satisfaction with engagement with SiG (N=33)**

	Number of respondents
Very satisfied	18
Satisfied	11
Neither satisfied nor dissatisfied	2
Dissatisfied	2
Total	33

Source: SQW analysis of beneficiary survey 2020

## Benefits, additionality and contribution

### Qualitative/process benefits

**How would you describe the degree of formality and optimisation of your processes overall?**

**Table D-1: Degree of formality and optimisation of your processes overall? (N=33)**

	At the time of your first engagement with SiG	Now as a result of SiG
Level 1 - Initial: Processes exist but are informal, ad hoc, and not properly characterised	14	0
Level 2 - Repeatable: Basic processes established, processes are repeatable	9	5
Level 3 - Defined: Processes are well defined and standardised	6	6
Level 4 - Managed: Process quantitatively measured and controlled	0	15
Level 5 - Optimising: Focus on process improvements	1	3
Don't know	3	4
Refused	0	0
Total	33	33

Source: SQW analysis of beneficiary survey 2020. N=32, one no response

**Figure D-1: Beneficiary progression through the Capability Maturity Model between first engagement with SiG (A, start year) and time of interview (B, Autumn 2020)**

Year of starting SiG	Capability Maturity Model Level					Don't know
	Level 1 - Initial: Processes exist but are informal, ad hoc, and not properly characterised	Level 2 - Repeatable: Basic processes established, processes are repeatable	Level 3 - Defined: Processes are well defined and standardised	Level 4 - Managed: Process quantitatively measured and controlled	Level 5 - Optimising: Focus on process improvements	
2020		A				B
			A → B			
2019	A → B					
		A → B				
2018						AB
		A → B				AB
2017					AB	
	A → B					
	A → B					
	A → B					
	A → B					
			AB			
2016		A → B				
		A → B				
	A → B					
2015	A → B					
		A → B				
			A → B			
			A → B			
2014			A → B			
		A → B				
		A → B				
	A → B					
		AB				
	A → B					
	A → B					
	A → B					
	A → B					
			A → B			
2013						AB
	A → B					
	A → B					

Source: SQW analysis of beneficiary survey 2020. N=33

**Which of the following benefits were achieved by March 2020 and you expect to achieve over the next two years as a result of the support your business has received from SiG? Tick all that apply.**

D.28 The most commonly achieved benefits are increase in workforce knowledge and skills (27/33, 82%), introduction of new or improved processes/practices (26/33, 79%) and improvements in leadership and management behaviours (26/33, 79%).

**Table D-2: Benefits achieved as a result of SiG (N=33)**

	<b>Achieved by March 2020</b>	<b>Expected over a two-year period from April 2020</b>	<b>Not expected / not relevant</b>	<b>Refused / don't know</b>
Increase in workforce knowledge and skills	27	4	1	1
Introduction of new or improved practices and processes	26	4	3	0
Improvements in leadership and management behaviours	26	4	2	1
Improved workforce capabilities	24	5	3	1
New or improved business strategy	23	4	4	2
Increased investment in staff training & development	20	5	6	2
Improvements in operational competitiveness	19	7	5	2
Increased investment in R&D and innovation	7	3	22	1
Increase confidence to base production in the UK, or return of manufacturing activities from overseas	7	2	21	3
New and/or improved product or service	5	8	18	2

Source: SQW analysis of beneficiary survey 2020

## Follow-up questions

**[If identified increase in workforce knowledge, skills, and capabilities] What are the top three skills/capabilities that have improved as a result of SiG? This could include technical, managerial, financial skills, or wider skills such as communication, team working etc.**

D.29 Management and leadership skills were most frequently cited by beneficiaries (20/29, 69%) as an area of improvement.

**Table D-1: Areas of improvement as a result of SiG (N=29)**

Area of improvement	Number of beneficiaries
Management/leadership	20
Technical skills and operational efficiency	11
Financial skills - KPIs and forecasting	8
Communication	8
Cultural change	8
Business structure and strategy	6
Team working	4
Problem solving	3
Waste awareness	1
Workload capacity	1

Source: SQW analysis of beneficiary survey 2020; Results not mutually exclusive. N=29, 27 respondents who said that they have achieved improved knowledge and skills plus two who said they expect to achieve this. Categories determined based on coding of open responses.

**[If identified introduction of new practices and processes] You stated previously that you have introduced new or improved practices and processes as result of SiG.**

**Please can you summarise practices or processes that SiG identified as requiring improvement?**

**Table D-2: Practice/processes identified as requiring improvement**

Area	Number of beneficiaries
KPIs and business reporting	9
LEAN and other production processes	8
New product introduction processes	8
Planning processes e.g. financial planning	8
Communication processes e.g. meetings	7
HR processes	7
Management processes	5
Value stream mapping	2

Area	Number of beneficiaries
Problem solving processes	1
Waste Processes	1
Customer engagement processes	1

SQW analysis of beneficiary survey 2020; Results not mutually exclusive. <sup>1</sup> N=27, 24 of the 26 respondents who said that they had observed new practices and processes could provide an answer to this question, plus an additional three who selected that it was an expected outcome. Categories determined based on coding of open responses.

### **Which of these changes have been implemented to date?**

D.30 All of those asked said that the changes have been at least partly implemented to date.

### **For beneficiaries where SiG support is complete: have these changes been sustained since SiG support ended?**

D.31 Of the eight beneficiaries who had completed the programme, five identified changes in practices and processes<sup>91</sup>. Four of these said that the practices had been sustained since the programme ended. One also could not answer this question as they have since sold the business so are unaware if the changes have been maintained. One other noted that Covid-19 meant that many of the changes implemented were forced to end.

### **If already increased investment in R&D and innovation - Can you estimate how much you invested in R&D per annum at the time of your first engagement with SiG and now as a result of SiG?**

D.32 Only one beneficiary could provide answers to both parts of this question<sup>92</sup>. They stated that R&D expenditure increased from £200k p/a at the time of first engagement, to £800k-£1m p/a currently.

### **If already introduced a new and/or improved product or service - You said that you have developed a new product or service as a result of engaging with SiG. can you briefly sum up what this is?**

D.33 Five beneficiaries have introduced new products/services as a result of SiG, these are:

- New products and services in treatments e.g. metal and precious metal coatings
- Microwave tube
- Commercial aircraft
- Services previously provided by supply chain (that beneficiary now has control of)
- Service to maintain, repair and modify aircrew helmets.

<sup>91</sup> N=5

<sup>92</sup> N=1, although 6 beneficiaries stated that they had increased investment in R&D, only one could provide numbers.

## Client base and contracts won/retained

Which of the following benefits were achieved by March 2020 and you expect to achieve over the next two years as a result of the support your business has received from SiG? Tick all that apply

D.34 In total 24/33 (72%) beneficiaries said that that had won and/or retained contracts by March 2020. The most common outcome (22/33, 67%) was contracts won, the least common (9/33, 27%) was diversification of client base.

**Table D-1: Benefits achieved as a result of SiG (N=33)**

	<b>Achieved by March 2020</b>	<b>Expected over a two-year period from April 2020</b>	<b>Not expected / not relevant</b>	<b>Refused / don't know</b>
Contracts won	22	6	5	0
Contracts retained	20	4	7	2
Export growth	11	8	12	2
Diversification of client base	9	11	11	2

Source: SQW analysis of beneficiary survey 2020. N=33,

### Follow-up questions

#### Contract values

D.35 Only 13 firms were able to quantify the value of contracts won/retained between their first involvement with SiG and March 2020: the median value of contracts won/retained due to SiG was £21m per firm of contracts won/retained.

D.36 Of the new contracts won, roughly 64% of the average value of contracts won as a result of SiG. and roughly 45% of the average contracts retained as a result of SiG were also from overseas exports.

D.37 Most (14/24, 58%) beneficiaries stated that the additional contracts won/retained were in a mixture of the aerospace and other sectors. 10/24 (42%) beneficiaries said that all of the new/retained contracts were in aerospace.

**Table D-1: Sectors of new/retained contracts (N=24)**

<b>Sector</b>	<b>Number of respondents</b>
Mix of aerospace and other sectors	14
All aerospace	10

Source: SQW analysis of beneficiary survey 2020. N=24 beneficiaries that achieved contracts won/retained



## Other quantifiable business impacts

D.38 In total 26/33 (79%) beneficiaries said that they had created and/or safeguarded jobs by March 2020. 21/33 (64%) said that they had achieved increased turnover by March 2020.

**Table D-1: Benefits achieved as a result of SiG (N=33)**

	Achieved by March 2020	Expected over a two-year period from April 2020	Not expected / not relevant	Refused / don't know
Jobs safeguarded	25	5	3	0
Improved productivity / value add per person	24	5	3	1
Jobs created	22	4	7	0
Reduction in costs (via efficiency, avoidance, operational change)	22	6	3	2
Increased turnover	21	6	6	0
Increased profitability	20	6	5	2
Increase in salaries of staff	19	4	9	1

Source: SQW analysis of beneficiary survey 2020.

**[If achieved increase in salaries] What was the average salary for manufacturing and production staff at the point you first engaged with SiG and in March 2020 (roughly)?**

D.39 On average, the salary increase was 12%.

**Table D-2: Change in average salary for manufacturing and production staff (N=8)**

	Salary before (£)	Salary after (£)	% increase
Beneficiary 1	35,000	37,500	7%
Beneficiary 2	15,600	16,400	5%
Beneficiary 3	25,000	30,000	20%
Beneficiary 4	27,000	28,500	6%
Beneficiary 5	Not available	Not available	3%
Beneficiary 6	Not available	Not available	25%
Beneficiary 7	22,500	25,000	11%
Beneficiary 8	29,000	35,000	21%
Average			12%

N=8, 19 beneficiaries noted an increase in salaries, only 8 could provide an answer to this question.

**[If achieved reduction in costs] What was the ratio of cost of goods sold to turnover at the point you first engaged with SiG and then in March 2020 (roughly)?**

D.40 Some different interpretations of this measurement were provided as it was clearly not a commonly used metric, for example, one consultee did not include the payroll in their calculations whereas another consultee specifically said this refers to gross margin (which does include labour costs).

**Table D-3: Change in ratio of cost of goods sold to turnover (N=4)**

	Ratio Before	Ratio After	Percentage difference
Beneficiary 1	80%	75%	-5%
Beneficiary 2	36%	24%	-12%
Beneficiary 3	73%	72%	-1%
Beneficiary 4	42%	40%	-2%
Average	63%	57%	-6%

Source: SQW analysis of beneficiary survey 2020. N=4, of the 22 beneficiaries who identified a reduction in costs, 4 were able to answer this question

**Employment to March 2020**

D.41 Only 12 respondents were able to quantify the number of jobs created/retained due to SiG support by March 2020.

D.42 On average, these firms created/retained 37 full-time-equivalent (FTE) jobs that were attributed to SiG (gross), equivalent to an 8% increase in employment between when they first engaged with SiG and March 2020 (as a reminder, 85% of survey respondents were medium sized at the time of interview, and 15% were large).

D.43 18 out of 33 survey respondents reported an increase in staff salaries. On average, beneficiaries expect a greater proportion of the additional staff to have a salary below £22,000 (25.7%) than above £43,000 (19.5%).

**Table D-1: Expected salaries of additional staff**

	Salary below £22,000 (%) (N=9)	Salary above £43,000 (%) (N=10)
Average	25.7	19.5

Source: SQW analysis of beneficiary survey 2020. N=9 for below and 10 for above, not all of the that stated an impact on jobs could provide an answer

D.44 Just under half of the beneficiaries (16/33, 48%) expect their future number of FTE to increase as a result of SiG.

**Table D-2: Future number of FTEs employed as a result of SiG (N=33)**

Answer	Number of beneficiaries
Higher	16
Lower	0
The same	8
Don't know	7
NA	2

Source: SQW analysis of beneficiary survey 2020.

D.45 Only 5 consultees could quantify this. Of these, two said zero additional FTE staff, one said 16, one said 14, and one said 10.

## Turnover to March 2020

D.46 Most (22/33, 67%) respondents stated that turnover was higher in March 2020 compared to the point of their first engagement with SiG<sup>93</sup>. No respondents said it was lower as a result of SiG.

**Table D-1: Change in turnover as a result of SiG (N=33)**

Answer	Number of beneficiaries
Higher	22
Lower	0
The same	8
Don't know	1
NA	2

Source: SQW analysis of beneficiary survey 2020. Q43. How much [more/less] turnover have you generated as a result of the engagement with SiG?

D.47 On average, beneficiaries attributed £4 million of their additional turnover to SiG. Clearly a high proportion of respondents could not answer this, with one stating that it is “immeasurable”.

**Table D-2: Value of change in turnover as a result of SiG (N=9)**

	Additional turnover (£m)
Total	36.4
Average	4.0

Source: SQW analysis of beneficiary survey 2020. N=9, although 22 respondents stated that their turnover is/was Higher in question 42, only 9 could provide numbers

**What proportion of the additional turnover resulting from your engagement with SiG is from exports outside the UK?**

D.48 The proportion varied from 0% to 100%. The average is 45%

**Table D-3: Proportion of additional turnover due to SiG from exports (N=11)**

Respondent	Proportion (%)
Beneficiary 1	33
Beneficiary 2	0
Beneficiary 3	7
Beneficiary 4	80
Beneficiary 5	80
Beneficiary 6	30
Beneficiary 7	50
Beneficiary 8	70
Beneficiary 9	0
Beneficiary 10	50
Beneficiary 11	100
Average	45

Source: SQW analysis of beneficiary survey 2020. N=11, of the 21 beneficiaries who said that turnover has changed, 11 could answer this question

**Do you expect your total turnover to be higher, lower or the same over the next two financial years as a result of your engagement with SiG?**

**Table D-4: Future turnover as a result of SiG (N=33)**

Answer	Number of Beneficiaries
Higher	19
Lower	0
The same	7
Don't know	6
NA	1

Source: SQW analysis of beneficiary survey 2020

Beneficiaries struggled to quantify future turnover impacts due to impact of Covid-19 and Brexit amongst other factors.

## Additionality

### What would have happened to the benefits reported without SiG?

**Table D-1: Additionality of SiG (N=33)**

Answer	Number of beneficiaries
Would have occurred but at a slower rate	17
Would have occurred but at a lower scale	9
Would not have occurred at all	8
Would have occurred but not the same quality	4
Would have occurred anyway in the UK	2
Would have occurred anyway but outside of the UK	1
Don't know	2

Source: SQW analysis of beneficiary survey 2020. Results not mutually exclusive.

### [If identified timing additionality] Without engagement with SiG, approximately how much longer would it have taken for you to achieve these benefits?

**Table D-2: Timing additionality of SiG (N=17)**

Time	Number of beneficiaries
Up to a year	1
Up to 2 years	3
Up to 3 years	3
Up to 4 years	2
Up to 5 years	5
Over 5 years	3
Don't know	3

Source: SQW analysis of beneficiary survey 2020. N=17, beneficiaries who identified timing additionality

### [If identified scale additionality] Without engagement with SiG, roughly what proportion of the benefits would have happened?

**Table D-3: Scale additionality of SiG (N=9)**

Proportion of benefits	Number of beneficiaries
Less than 25%	1
25% to 49%	1
50% to 74%	0
75% to 100%	1
Don't know	6

Source: SQW analysis of beneficiary survey 2020. N=9, beneficiaries who identified scale additionality.

## Contribution and Learning

**Which aspects of SiG's design/delivery were most critical in enabling benefits to be achieved?**

**Table D-1: Critical elements of SiG's design/delivery for enabling benefits (N=33)**

Aspect of design/delivery	Number of beneficiaries who said it was critical	Number of beneficiaries who said it was most critical
On-site support from SiG staff based at the business	27	15
Support to develop business strategy/objectives	23	11
Initial diagnostics	22	3
Detailed understanding of the business and its people	17	3
Expert advice from other delivery partners	17	3
Off-site events and training	15	2
SiG's facilitated network of beneficiaries to share knowledge/best practice	12	2
Targeting and selection processes	5	1
Other (please specify – Note: this is the opportunity to pick up on any other critical success factors – e.g. holistic nature, intensity, long-term support)	3	1
Don't know	1	1
Refused	1	1

Source: SQW analysis of beneficiary survey 2020; Results not mutually exclusive

**What other factors outside of SiG may have contributed to the outcomes described above? (N=33)**

**Table D-2: Factors contributing to outcomes (N=33)**

Other factor	Number of beneficiaries
Market demand and external sector and economic conditions	21
New senior management team/business leadership in place	12
Other R&D activities in the business	7
New equipment purchased	6
Existing customer relationships	5
Other	5
Pre-existing or new business plan/strategy implemented	3
Existing internal training programmes	3

Other factor	Number of beneficiaries
Technology changes and developments	3
Regulatory or policy changes	3
Site expansion	2
No other factors	2
Overarching Aerospace Sector Deal/ATI Strategy	1
Other funders or organisations e.g. ATI, AGP	0

Source: SQW analysis of beneficiary survey 2020; Results not mutually exclusive

**What has been the role of SiG in achieving the outcomes described relative to these other factors?**

**Table D-3: Role of SiG relative to other factors (N=30)**

Contribution of SiG	Number of beneficiaries
SiG had no influence	1
SiG contributed to outcomes, but was not necessary	5
SiG was an important contributory factor alongside others	10
SiG was the critical contributory factor	12
Don't know	2

Source: SQW analysis of beneficiary survey 2020. N=30, of the 31 beneficiaries who noted at least one other contributory factor, one no response

**Are there any factors that hindered your ability to deliver anticipated benefits from SiG? This could be factors relating to the programme, internal factors (e.g. lack of funding to invest in new equipment needed) or external factors (e.g. pace of change in competitors, Covid-19 pandemic). Note, interviewer to prompt on Covid-19).**

**Table D-4: Factors that hindered ability to get anticipated benefits (N=30)**

Hindrance	Number of beneficiaries
Covid-19	18
Wider industry and market conditions (inc. supply chain)	4
Poor business fit	4
Brexit	3
Employee issues	3
Staff turnover (internal)	3
Sig reporting structures	2
Resource commitment to SiG	2
None	2
UK export licensing regime	1



Hindrance	Number of beneficiaries
Prescriptive nature of programme	1

Source: SQW analysis of beneficiary survey 2020; answers not mutually exclusive. N=30, three no response. Categories determined based on coding of open responses.

**To what extent has Covid-19 hindered your ability to deliver benefits from SiG? Tick one**

**Table D-5: Extent of Covid-19 influence on delivering benefits from SiG (N=19)**

Answer	Number of beneficiaries
Substantially	14
To some extent	5
A little	0
Don't know	0
Total	19

Source: SQW analysis of beneficiary survey 2020. N=19, in previous question 18 people highlighted Covid-19 as an issue however an additional one interviewee answered this follow-up question

## Wider consequences of SiG

**Did your participation in SiG mean that you could not engage in other business development or management activities?**

D.49 The majority of businesses (27/33, 82%) reported that participation in SiG had not prevented them from engaging in other business development or management activities

**Table D-1: Effect on engagement with other business activities (N=33)**

	Number of respondents
Yes – substantially	0
Yes – to some extent	1
Yes – a little	4
No	27
Don't know	1
Total	33

Source: SQW analysis of beneficiary survey 2020.

**Has your engagement with SiG led to any unintended consequences?**

D.50 Fifteen respondents reported that their engagement with SiG had led to unintended consequences. Eight respondents reported a range of positive consequences and six reported negatives consequences.

**Table D-2: Unintended consequences as a result of SiG (N=30)**

	Number of respondents
Yes	15
No	13
Don't know	2
Total	30

Source: SQW analysis of beneficiary survey 2020. N=30, three no response

**Looking forward, are you more likely to invest internal funds in this type of management / leadership training due to your experience of SiG?**

**Table D-3: Likelihood of future investment into similar training (N=30)**

	Number of respondents
Yes – already have	6
Yes – in future	17
Possibly	2
No	1
Don't know	4
NA	1
Total	31

Source: SQW analysis of beneficiary survey 2020. N=30, three no response

**[If yes] Are you more or less likely to pay for support from the private sector as a result of your SiG experience, or has it not made a difference in this respect?**

**Table D-4: Likelihood of future investment into private sector support (N=23)**

	Number of respondents
More likely	12
Less likely	1
No difference	7
Don't know	3
Total	23

Source: SQW analysis of beneficiary survey 2020. N=23, beneficiaries who said that they are more likely to invest funds in similar training.

## Wider benefits

**Have any of the following also benefited indirectly as a result of your involvement in SiG, or will benefit in the next two years?**

D.51 Of the key groups identified, customers were the most commonly noted (20/25, 80%) as having benefitted to date as a result of business' involvement in SiG.

**Table D-1: Groups who have benefitted indirectly as a result of involvement with SiG (N=26)**

	Achieved already	In next two years
Customers	20	5
Suppliers	13	4
Competitors	4	0
Collaborators	9	3
Don't know	1	0
Refused	1	1

Source: SQW analysis of beneficiary survey 2020. N=26, 6 no response

**[If yes to suppliers] Which sector(s) are the suppliers in?**

**Table D-2: Supplier sectors (N=12)**

	Number of respondents
Aerospace	5
Manufacturing	4
Machinery suppliers	2
Electronics	2
Distribution	1
Digital suppliers	1
Chemicals	1
Construction	1
Unable to say	1

Source: SQW analysis of beneficiary survey 2020. N=12, of the 13 beneficiaries that responded Yes to Q59, one did not provide an answer to this.

**[If yes to suppliers] How have suppliers benefited**

**Table D-3: Benefits to suppliers (N=9)**

	Number of respondents
Improved internal processes and procedures when dealing with suppliers	3
Increased business	3
Supply chain certainty	2
Growth	1
Unable to say	1

Source: SQW analysis of beneficiary survey 2020. N=9, of the 13 beneficiaries that responded Yes to Q59, four did not provide an answer to this. Note categories used have been formed based on open response.

**Can you estimate how many more FTE jobs have been created in your suppliers as a result of the support your business has received from SiG?**

D.52 No responses to this question, with only one indicating that they would expect it to have created jobs in their direct suppliers. This one respondent was unable to quantify by how many FTEs this would have increased.

**To what extent, if at all, do you think SiG has encouraged knowledge spilling in from other sectors (e.g. automotive, manufacturing, transport, energy) to your business?**

**Table D-4: Extent of knowledge spillover from other sectors encouraged by SiG (N=30)**

	Number of respondents
Yes – a large extent	6
Yes - to a moderate extent	8
Yes – to a small extent	7
Not at all	2
Don't know	6
NA	1
Total	30

Source: SQW analysis of beneficiary survey 2020. N=30, three no response

**In your opinion, has SiG contributed to any of the following longer-term impacts for the UK aerospace industry to March 2020, or do you expect it to contribute to them within the next 2-3 years? Tick all that apply.**

**Table D-5: Contribution of SiG to longer-term impacts for UK aerospace industry (N=26)**

	Achieved	Expected
Promoting innovation in the wider aerospace sector	15	1
A more competitive and diverse aerospace engineering sector	18	5
Anchoring future production and manufacturing in the UK	19	4
Levelling regional unemployment levels	4	2
Refused	1	1

Source: SQW analysis of beneficiary survey 2020. N=26, 7 no response

**The future of SiG**

**On a scale of 0-10, how likely are you to recommend SiG to other potential beneficiaries, where 0 is you would not recommend SiG at all, and 10 is you would recommend SiG unreservedly.**

**Table D-6: Likelihood of recommending SiG (N=30)**

	Number of respondents
0 (Would not recommend SiG at all)	0
1	2
2	0
3	1
4	1
5	1
6	0
7	1
8	5
9	6
10 (Would recommend SiG unreservedly)	13
Total	30

Source: SQW analysis of beneficiary survey 2020. N=30, 3 no response

**Do you have any suggestions for improving the SiG programme going forward, to maximise the programme's added value (above and beyond what would be achieved without SiG) and impact for your firm and the aerospace sector as a whole?**

**Table D-7: Suggestions to improve SiG programme for businesses (N=27)**

	Number of respondents
Increased tailoring/flexibility of programme	13
Ensure quality staff are retained and consistent	5
Increased SiG guidance when deciding programme focus	2
Review governance and monitoring processes	2
Consider existing capabilities/processes before reinventing the wheel	2
Bottom-up approach to training	1
Increase awareness of programme intensity	1
Reduce length of programme	1
Improve offer following programme completion	1
Increase focus on developing orders earlier in the programme	1
None identified	1

Source: SQW analysis of beneficiary survey 2020. N=27, 6 no response. Categories determined based on coding of open responses.

## Business profile

**If your business were to cease trading tomorrow, do you think any of your competitors in the UK would take up your current sales over the next year?**

D.53 The majority of businesses (21/29, 72%) reported that some or all of their current sales would be taken up by competitors over the next year if they were to cease trading tomorrow.

**Table D-1: Proportion of sales that would be taken up by competitors (N=29)**

	Number of respondents
Yes, all of our sales	9
Yes, some of them	12
No, no-one would take up our sales	4
Don't know	2
NA	2

Source: SQW analysis of beneficiary survey 2020, N=29, 4 no response

**Please can you tell us what proportion of your revenue was from customers in the aerospace sector and/or from other sectors, in the 2019/20 financial year?**

D.54 On average the proportion of revenue from customers in the aerospace sector versus other sectors in the 2019/20 financial year was 59%<sup>94</sup>.

<sup>94</sup> N=25, 8 no response

## Annex E: International context review

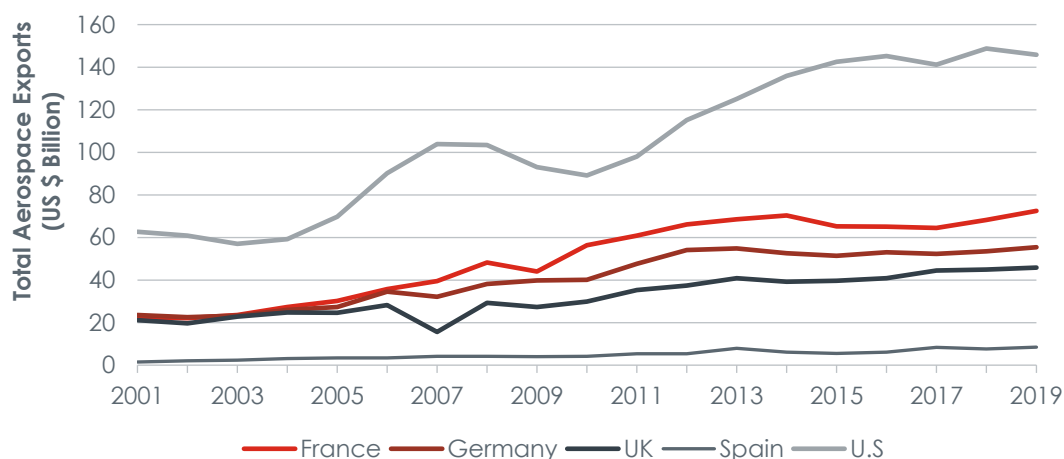
- E.1 The UK's international competitors support their respective aerospace sectors, and so part of the strategic case for supporting UK-based aerospace suppliers is to maintain competitiveness against international countries. Furthermore, the UK's share of the global aerospace supply chain is in decline, partly driven by the failure of many UK suppliers to achieve globally competitive standards of costs and performance. Within this context, we summarise the performance of the aerospace sector in key competitor countries – Germany, France, Spain and the U.S – and identify publicly supported aerospace programmes, initiatives institutions and organisations in these countries. In so doing, the purpose is to provide a 'snapshot' of the global context in which SiG participating companies operate in.
- E.2 It is worth highlighting two points relating to the data presented in this Section. First, the data for each selected country is not intended to be comprehensive but provides only a partial picture based on a 'rapid' review of the evidence collected through our desk research. Second, we searched for programmes and initiatives that may be similar to SiG in competitor countries but were not able to find any which could be directly compared (and from which any insights could be drawn). This does not mean to say there are none; we just could not identify any from publicly available information. Given this, we present below key aerospace programmes in support of SME suppliers, many of which have a strong R&D and innovation focus, relating to national priorities for aerospace and defence research.
- E.3 The sector data for competitor countries was provided by BEIS (based on published sources), supplemented by our own desk research. The latter also involved a review of aerospace programmes, initiatives, institutions and policies.

### Sector performance

Figure E-1 shows a breakdown of annual total exports for Germany, France, Spain and the U.S. from 2001 to 2019. Of the comparators investigated, the U.S., France and Germany have consistently exported more than the UK. The U.S. was by far the largest exporter with the gap widening over time. It is worth noting that until 2004, the France and Germany were at a similar level to the UK.



**Figure E-1: Total aerospace sector exports 2001-2019**



Source: SQW based on ITC Trade Map data.

E.5 In terms of civil aerospace market share of World GVA (2006 to 2015) the U.S. consistently accounted for almost half of the global market share, while the UK accounted for a similar proportion to Germany (Table E-1).

**Table E-1: Civil aerospace market share 2006-2015 (3-year averages)**

Country	2006	2009	2012	2015
France	9%	10%	9%	9%
UK	12%	8%	8%	7%
Germany	8%	8%	8%	7%
U.S.	42%	43%	47%	47%

Source: SQW based on BEIS 2018 market share data. Note: the analysis involves assumptions and judgements specific to BEIS

E.6 Table E-2 shows that UK aerospace ranks consistently lower than France, Germany and the U.S. across value added, employment and labour productivity, with the U.S. being the highest<sup>95</sup>. Of the four, the UK experienced the largest increase in employment between 2005 and 2017, however value added per employee grew by 1.7%, lagging behind the comparators.

<sup>95</sup> Note this data was not available for Spain, however for reference the Spanish aerospace industry employed over 57,600 people in 2019 (Invest in Spain (2020) [Aerospace](#))

**Table E-2: Aerospace value added, employment and labour productivity in air and spacecraft related machinery**

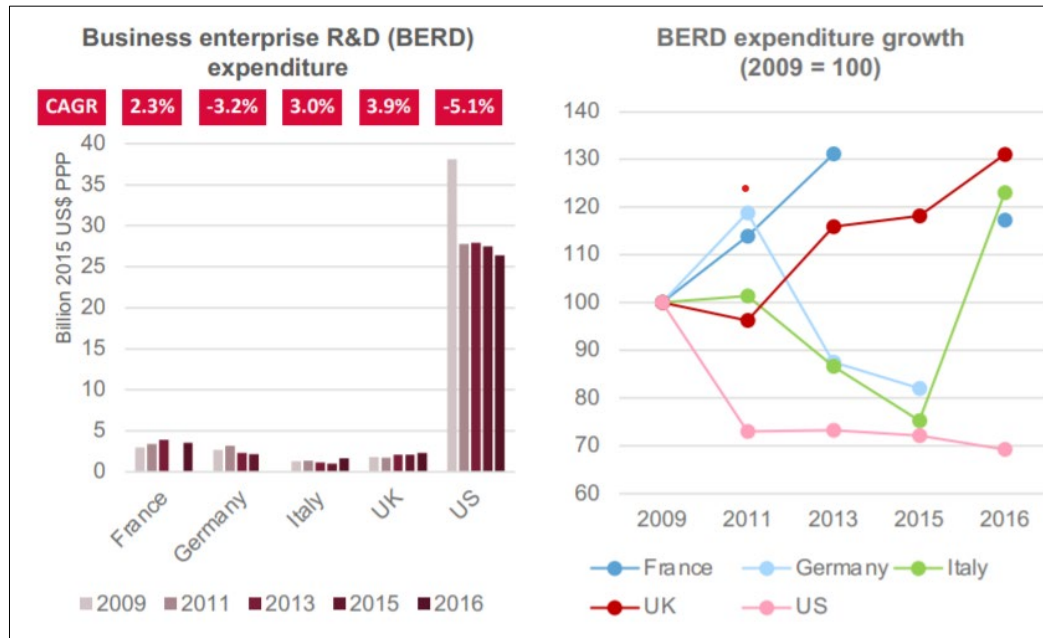
Country	Value added		Employment		Value added per employee	
	Billions US\$, 2017	CAGR 2005-2017	Thousand US\$, 2017	CAGR 2005-2017	Millions US\$, 2017	CAGR 2005-2017
France	22.6	9.4%	401.2	0.4%	324.7	4.7%
UK*	12.9	2.5%	108.3	0.7%	119.4	1.7%
Germany	16.5	6.0%	77.9	0.5%	211.8	9.9%
U.S.	130.3	5.2%	401.2	0.4%	324.7	4.7%

Source: University of Cambridge Institute for Manufacturing (2021) [UK Innovation Report](#)

\*Note: Due to data unavailability 2016 values are used in the 2017 series for the UK

E.7 Figure E-2<sup>96</sup> indicates that business enterprise expenditure on R&D (BERD) in UK aerospace grew by 3.9% between 2009 and 2016, a higher rate than France, Germany and the U.S.

**Figure E-2: Business enterprise R&D (BERD) expenditure in air and spacecraft and related machinery**



Source: University of Cambridge Institute for Manufacturing (2021) [UK Innovation Report](#)

Note: CAGR for countries are based on data for the first and last available years within the 2009-2016 range.

<sup>96</sup> Note this data was not available for Spain, however for reference the Spanish aerospace sector has experienced consistent industry investment of over 10% of turnover into R&D over the last decade (ITO (2020) [Spain – Country Commercial Guide](#))

E.8 The following Sections provide a brief overview of the UK’s international competitor’s respective aerospace sectors. This comprises a ‘snapshot’ summary for each comparator, including the relevant aerospace policies and publicly supported aerospace programmes, initiatives and institutions identified.

## Germany

E.9 Germany is considered a global aerospace hub, home to leading players in both the civil and defence aviation markets, including Airbus, Collins Aerospace, Diehl Aviation and Liebherr Aerospace. The German aerospace sector has experienced rapid growth in recent decades, with the sector generating €40 billion total sales in 2017<sup>97</sup>. Key actors including the German Federal Government have highlighted the opportunities arising from aerospace market growth, recognising the role that the German aerospace sector can play in international aircraft production. A central institution identified for the German aerospace sector is that of the German Aerospace Centre (DLR). This national centre for aerospace, energy and transportation research, receives approximately €200 million of government funding for research each year and supports aerospace companies with its expertise.

E.10 Key policies identified include the Aviation Strategy of the Federal Government 2016<sup>98</sup> which outlines the government’s goals to make Germany a global technological pioneer in the aviation sector, encouraging the development of competitive, efficient, environmentally friendly and safe passenger and non-passenger aviation systems. The German High-Tech Strategy<sup>99</sup> also relates to the German aerospace sector, aiming to enhance research and innovation across the country.

E.11 A number of German aerospace-related research and/or support programmes and organisations were identified from the review and are outlined in Table E-3.

**Table E-1: German research and/or support programmes and organisations in the aerospace sector**

Key programmes/ Organisations	Summary
<a href="#">BMW Federal Aerospace Research Programme</a>	A Government programme which funds research and technology projects across the innovation chain in areas such as technology development and demonstration.
<a href="#">BMW Federal Aircraft Equipment Supplier Programme</a>	A Government programme which funds R&D projects of the supplier industry, including engine manufacturers, by granting loans to contain development risks.
<a href="#">ESA Business Incubation Centres</a>	Centres provide support to new, small enterprises or start-ups developing space-related technology, applications and/or expertise.

<sup>97</sup> BDLI (2018) Industry Figures of the German Aerospace Industry 2018

<sup>98</sup> German Federal Government (2016) [Aviation Strategy of the Federal German Government](#)

<sup>99</sup> German Federal Government (2018) [Research and innovation that benefit the people](#)

Key programmes/ Organisations	Summary
<a href="#">SPACE Deutschland (part of Space Europe)</a>	A not-for-profit organisation which aims to improve the performance and competitiveness of SME suppliers in the aviation industry.

Source: SQW

## France

- E.12 France is the world’s second largest exporter in the aeronautical field, home to many leading players including Airbus, Dassault, Thalès and Safran. As such, the French aerospace industry is recognised as a major economic and strategic asset for the country, providing a substantial number of jobs to the nation and encouraging R&D and innovation. For example, in 2017 it was reported that €69 billion of revenue was generated by the sector<sup>100</sup>.
- E.13 The success of French aerospace R&D can largely be linked to government investment and funding. The French National Aerospace Research Centre (ONERA) receives £91m of Government funding annually and is tasked with developing aeronautical research and supporting its industrial commercialisation. The ‘Aerospace Valley’ is a key cluster of the French aerospace industry in two adjacent regions of South-West France<sup>101</sup>, accounting for approximately a third of the French aerospace workforce. Likewise, the National Centre for Space Studies is the French Government agency responsible for shaping and implementing France’s space policy in Europe. The CNES develops and executes space programmes with its partners in the scientific community and industry and is closely involved in many international cooperation programmes.
- E.14 A key policy identified as relevant to the French aerospace sector is the National Research Strategy 2018<sup>102</sup>, which whilst not specific to aerospace, aims to identify and address the key scientific, technological, environmental and societal challenges by promoting and maintaining high-level research.
- E.15 Table E-4 outlines French aerospace-related research and/or support programmes and organisations.

**Table E-1: French research and/or support programmes and organisations in the aerospace sector**

Key Programmes/ Organisations	Summary
<a href="#">Ambition SME-ETI Programme (GIFAS and BPIFrance)</a>	This selective programme led by GIFAS and BPI France aims to accelerate the competitiveness of SMEs and mid-caps in the aeronautics sector.

<sup>100</sup> Business France (2018) [The French aerospace industry ranked second in the world](#)

<sup>101</sup> Nouvelle Aquitaine and Occitania

<sup>102</sup> Government of France (2018) [National Research Strategy](#)

Key Programmes/ Organisations	Summary
<a href="#">Industrial Performance programme (GIFAS)</a>	This GIFAS programme aims to improve supply chain performance in midcaps, SMEs and very small companies.
<a href="#">Industry of the Future Programme</a>	This GIFAS programme aims to strengthen the competitiveness of the sector by encouraging the introduction of new '4.0 or industry of the future' technologies.
<a href="#">SPACE France (part of Space Europe)</a>	A not-for-profit organisation which aims to improve the performance and competitiveness of SME suppliers in the aviation industry.
<a href="#">IRT Saint Exupery</a>	Public-private partnership, eight world-class centres (IRTs) focusing on collaboratively developing technologies and resources for Aeronautics, Space and Embedded Systems.
<a href="#">ESA Business Incubation Centres</a>	Business incubation centres provide support to start-ups or young, small enterprises who are developing space related technology, expertise and/or application and target the non-space market.
<a href="#">IndustriLAB (funded by the Hauts-de-France Region)</a>	An innovation platform for the aerospace industry, which aims to provide space for industrialists to innovate and encourage innovation, R&D and training and awareness activities in the industry.

Source: SQW

## Spain

- E.16 Spain is also considered one of the leaders in the European aerospace industry. There are a number of leading Original Equipment Manufacturers (OEMs) based in Spain, including Airbus, Cessna, Boeing Research and Technology Europe and Bombardier. The importance of the Spanish aerospace sector is recognised as critical to driving innovation and job creation, thereby supporting economic growth. For example, in 2019 the aerospace and defence market saw €13.4 billion in turnover<sup>103</sup>. Activity in the Spanish aerospace industry is concentrated in Madrid, with half (49%) of total sales generated there. However, other significant clusters include Andalusia (22% of sales), Castilla La Mancha (12%) and the Basque Country (10%)<sup>104</sup>.
- E.17 The National Institute of Aerospace Technique is the public research organisation under the Ministry of Defence, which carries out scientific R&D of systems and prototypes for the aerospace sector. Additionally, research centres such as the Boeing Research and Technology Centre (Madrid), Aeropoliis Technology Park and CATEC Advanced Center for Aerospace Technologies encourage R&D and collaboration between research institutes and businesses.

<sup>103</sup> Invest in Spain (2020) [Aerospace](#)

<sup>104</sup> ITA (2020) [Spain – Country Commercial Guide](#)

- E.18 Relevant policies identified for Spain include the National Aerospace Security Strategy 2019<sup>105</sup>, an open institutional collaboration focused on national capabilities, the establishment of infrastructure required for protection and defining national and international agreements. The Spanish Strategy for Science, Technology and Innovation<sup>106</sup> is also relevant, outlining general objective for RDI activities in Spain from 2013 to 2020.
- E.19 A number of Spain aerospace-related research and/or support programmes and organisations were identified from the review and are outlined in Table E-5.

**Table E-1: Spanish research and/or support programmes and organisations in the aerospace sector**

Key programmes	Summary
<a href="#">AERIS Programme (Advanced Centre for Aerospace Technologies)</a>	A programme designed to integrate and improve the competitiveness of the aeronautical cluster in the Andalusian-Alentejo Cross-Border Region.
<a href="#">Space España (part of Space Europe)</a>	A not-for-profit organisation, the programme's objective is to offer and implement services within businesses which aim to enhance the competitiveness of the aerospace industry supply chain.
<a href="#">CTA</a>	An aerospace test laboratory which specialises in the development and certification of aerospace structures, systems and materials.

Source: SQW

## United States of America

- E.20 The U.S. aerospace industry is consistently ranked the largest and most competitive in the world, with the sector generating total sales revenue of \$929 billion in 2018<sup>107</sup>. Washington is home to several global aerospace players, including Blue Origin and Boeing Commercial Airplanes, alongside successful home-grown companies such as Planetary Resources and Spaceflight Industries<sup>108</sup>. Other notable companies include Lockheed Martin, Gulfstream Aerospace, Meggitt Polymers and Composites and Collins Aerospace.
- E.21 The U.S. has a robust aerospace supply chain, with local suppliers partnered widely both at home and abroad. For example, Washington's Aerospace Innovation Cluster is regarded as the result of the organic development of a large and diverse supply chain over the past 90 years, bringing together over 1,350 companies.<sup>109</sup> In terms of R&D expenditure, the U.S. has historically been the world leader. Following a deal reached by Congress in 2019 to prevent Budget Control Act cuts in R&D expenditure, NASA, the

<sup>105</sup> Government of Spain (2019) [National Aerospace Security Strategy](#)

<sup>106</sup> OECD (2019) [Spanish Strategy for Science and Technology and Innovation](#)

<sup>107</sup> Aerospace Industries Association (2019) [Facts & Figures U.S. Aerospace & Defence](#)

<sup>108</sup> PWC (2019) [Aerospace manufacturing attractiveness rankings](#)

<sup>109</sup> Washington Department of Commerce (2015) [Aerospace in Washington State](#)

independent agency responsible for the U.S. civilian space programme and aeronautics and aerospace research, experienced a 13% increase in annual budget to \$13.6 billion<sup>110</sup>.

- E.22 A key policy relating to the U.S. aerospace sector is that of the National Strategy for Aviation Security of the United States of America, which outlines a holistic and adaptive approach to ensuring the safety and security of the aviation ecosystem<sup>111</sup>.
- E.23 A number of U.S. aerospace-related research and/or support programmes and organisations were identified from the review and are outlined in Table E-6.

**Table E-1: U.S research and/or support programmes and organisations in the aerospace sector**

Key programme	Summary
<a href="#">California SmartMatch (Los Angeles County Economic Development Corporation)</a>	A supplier matchmaking service, which aims to connect OEMs with small businesses in aerospace and advanced transportation industries.
<a href="#">Small Business Innovation Research/ Small Business Technology Transfer Program</a>	A NASA funded programmes focused on research, development and demonstration of innovative technologies.
<a href="#">PTACS of Michigan</a>	Government contracting experts who offer a range of support and services to businesses to assist them in successfully completing government contracts.
<a href="#">Caltech Center for Technology and Management Education</a>	The Center runs a range of operations management training programmes, including training in global supply chain management and procurement processes; scheduling of production processes; and logistics design and management.
<a href="#">The Joint Centre for Aerospace Technology Innovation (JCATI)</a>	Aims to support the Washington aerospace industry by facilitating academic collaboration and leveraging public university expertise to transition technology solutions.
<a href="#">Centre of Excellence for Aerospace and Advanced Manufacturing (Washington)</a>	The centre provides resources and leadership to promote and support economic growth in the aerospace and advanced manufacturing sector. The Centre supports various programmes, working with industry partners and educational institutions to develop the talent pipeline in terms of future workers in the aerospace industry sector.
<a href="#">Center of Excellence for Alternative Jet Fuels and Environment, (ASCENT)</a>	A cooperative aviation research organisation co-led by Washington State University and the Massachusetts Institute of Technology and funded by the FAA, NASA, the Department of Defense, Transport Canada, and the Environmental Protection Agency. The aim of the organisation is to “create science-based solutions for the aviation industry’s biggest challenges”.

Source: SQW


<sup>110</sup> Aerospace Industries Association (2019) [Facts & Figures U.S. Aerospace & Defence](#)

<sup>111</sup> The White House (2018) [National Strategy for Aviation Security](#)



## Reflections

- E.24 This rapid review of comparator nations has summarised the performance of the aerospace sector in key competitor countries – Germany, France, Spain and the U.S – and identified publicly supported aerospace programmes, initiatives, institutions and organisations in these countries. The sector performance data indicates that the aerospace industry is a highly competitive international market with key countries receiving strong support. This evidence highlights the strategic case for supporting UK-based aerospace suppliers to maintain competitiveness against international countries, given the UK's current declining share in the global aerospace supply chain.

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