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# Realising the promise of the Defence and Security Industrial Strategy in R&D and exports

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**W**hen the UK published its new *Defence and Security Industrial Strategy (DSIS)* in March 2021, it marked a meaningful shift in the UK's defence industrial policy.<sup>1</sup> The new strategy dispensed with several core principles for defence acquisition that had been the backbone of UK defence industrial policy over much of the last decade. Gone were the tenets of previous eras, such as the principle towards 'competition by default' from the 2010 *Strategic Defence and Security Review* and the 2012 *National Security Through Technology White Paper*.<sup>2</sup>

Instead, the DSIS represented a real effort to bring defence acquisition in line with wider UK defence policy by incorporating key concepts from its 'parent' strategy, the cross-government *Integrated Review of Security, Defence, Development and Foreign Policy*.<sup>3</sup> Prominent examples include the language of achieving 'strategic advantage through science and technology' (S&T), as well as an emphasis on promoting prosperity and wider social value. Importantly, the DSIS also recognised the defence sector as a strategic capability in its own right. The DSIS thereby aims to support the broader objectives of UK defence policy, as well as contributing to economic growth and employment, including the development of a highly

skilled workforce, particularly in locations where such jobs are scarcer.

In both the DSIS and the Integrated Review, there is an explicit move to seek S&T dominance in key areas, both to ensure strategic advantage over competitors (e.g. China), but also to drive economic growth through exports. In the language of the Integrated Review, this means an ambition for the UK to 'be recognised as a [S&T] Superpower, remaining at least third in the world in relevant performance measures for scientific research and innovation and having established a leading edge in critical areas'.<sup>4</sup> For the DSIS, it means establishing 'a more collaborative cross-government approach, across defence and security [...] to maximise support to UK exports thereby increasing UK prosperity, improving security for our citizens at home and abroad, and reinforcing the UK's place in the world'.<sup>5</sup>

This short commentary provides a brief overview of the core principles of the DSIS, before reflecting on two specific aspects underpinning the DSIS assumptions, notably in relation to research and development (R&D) and exports. This paper does not derive from a single piece of RAND research; rather, it seeks to offer a reflective perspective on the issues drawing on selected published research by RAND Europe and others.

## Reset in government–industry relationships

The DSIS recognises that the unique nature of the defence market requires a bespoke approach that is focused on building resilience through protecting critical technologies and capabilities to ensure strategic imperatives and operational independence are retained. This, in turn, is based on nurturing close relationships with other trusted nations where necessary, and deriving strategic advantage through S&T – recognising that the UK’s competitive edge must be qualitative, in the absence of superior mass or numbers. Such an approach builds on the UK’s existing strengths: the unique critical technologies and capabilities of the UK’s defence industrial base,<sup>6</sup> and the continued cooperation in S&T research with key European Union (EU) countries, as well as through the North Atlantic Treaty Organization (NATO) and the United States (US).<sup>7</sup>

The reset towards a more tailored approach to the defence market articulated in the DSIS is both welcome and timely, and specifically targets some of the structural challenges affecting both MOD acquisition programmes and wider industrial competitiveness that RAND research has identified over the years. A number of these have arisen due to a lack of constructive dialogue between the defence industry and the MOD.<sup>8</sup> Without this dialogue, the UK MOD has struggled to make procurement decisions that are informed by sound knowledge of the industrial base and an understanding of wider benefits to the UK in terms of prosperity, social value and resilience. In turn, defence primes in particular, have struggled to justify long-term investments in their workforces, production lines or R&D without greater knowledge and certainty around the

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government’s commitment to future programmes. Small and medium enterprises (SMEs) have also found it especially difficult to find ways to feed innovative solutions to the MOD for a variety of reasons, including the complexity of defence procurement, requirements and standards.<sup>9</sup>

Where there have been gaps in industry–government dialogue, acquisition programmes have also seen misaligned understanding and management or distribution of risk. In this sense, the closer relationship between industry and the government envisaged by the DSIS offers a practical opportunity to pursue defence acquisition decisions in ways that are more constructive for individual programmes, as well as for the broader defence portfolio and the UK economy. The DSIS hopes that the closer collaboration between government, the military and industry also underpins successful export campaigns (e.g. via the ‘Team UK’ approach), seen as another key enabler for the delivery of wider economic benefits.

However, while the DSIS articulates the desire for a more strategic partnership between industry and the MOD, as well as a more holistic treatment of defence

acquisition and the industrial base, setting out a strategy is only the beginning of the process. As with all official documents, once written, the key stakeholders must then address the longer, more complex and more difficult task of implementation.

## Defence R&D challenge

One prominent example of an area where aspiration and reality may need to further converge is spending on defence R&D, an underlying enabler for achieving the desired ‘strategic advantage through S&T’.

The success of delivering on the ambitions set out in the DSIS, and the Integrated Review more broadly, relies on the ability of the UK defence industrial base and the

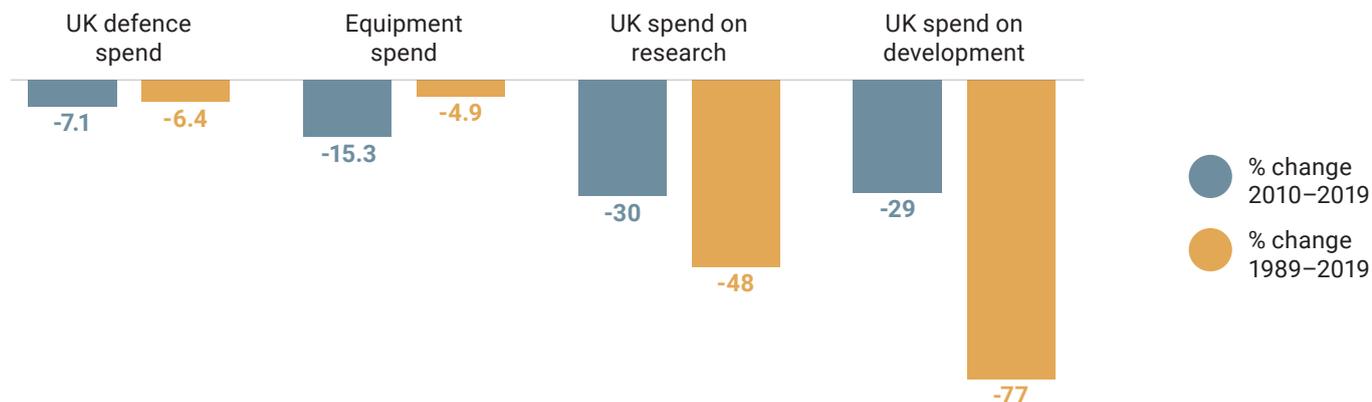
S&T base as a whole to continue developing innovative solutions to respond to the challenges of the ever-changing operating environment. As shown in Table 1, UK defence expenditure has fallen since the end of the Cold War by just over six per cent in real terms, with the entirety of this decrease having taken place since 2010. Since 2010, the share of the defence budget going to equipment, including R&D, has stayed relatively constant between 20 and 25 per cent of the total MOD budget, but overall equipment spend has declined in real terms by 15 per cent since 2010. Most strikingly, the spending on defence research has declined by 30 per cent and defence development by 29 per cent since 2010, and 48 per cent and 77 per cent since 1989 (see Figure 1). These declines are significantly greater in relative terms than those seen in the overall defence equipment

Table 1: Defence spending and the disproportionate cut in development spending in £m, 1989–2021

	1989 (£ million)		2010 (£ million)		2018/2019 (£ million)	2020/2021 (£ million)	
	1989 prices	2019 prices	2010 prices	2019 prices	2019 prices	2021 prices	2019 prices
<b>UK defence spend</b>	21,167	50,039	39,053	50,451	46,861	52,291	50,280
<b>Equipment spend</b>	4,657	11,008	9,568	12,360	10,463	14,672	14,108
<b>UK spend on research</b>	428	1,072	614	793	546	919	884
<b>UK spend on development</b>	1,922	4,818	1,225	1,582	1,101	146	140

SOURCES: Numbers for 1989, 2010 and 2019 from Table 5 in Andrew Dorman, Trevor Taylor, Matthew Uttley and Benedict Wilkinson (2020). NATO reports on UK spending from 1990, 1991, 2011 and 2019 to generate original numbers for total defence spending and total spending on equipment. The data on UK R&D spending is taken from the Statement on the Defence Estimates 1989, Volume 2, the MOD’s own defence statistics from 2011 and 2012, and Defence Departmental Resources 2019. Further data from Defence Department Resources 2021, Tables 5b and 5c, as well as NATO’s Press Release, Tables 1 and 8a, has been added by the authors for comparison.

Figure 1. Percentage change in real-terms spending, 1989–2019



SOURCE: Adapted from Table 5 in Andrew Dorman, Trevor Taylor, Matthew Uttley and Benedict Wilkinson (2020).

budgets, showing that R&D spending has experienced a disproportionate drop over the last two decades.

The 2021 figures added to the table for completeness indicate a welcome change in the UK’s commitment to increasing the amount of the defence budget specifically allocated towards R&D. However, this is a relatively recent phenomenon after decades of neglect. Given the lag between R&D investments and the fielding of new capability, which can range from 10 to 25 years, long-term, sustained spending on R&D is required.<sup>10</sup>

Additionally, these shortfalls in research funding are not limited to government spending: while it can be difficult to parse out defence-specific figures, the UK’s overall share of R&D funding as a percentage of GDP also lags behind that of many of its international counterparts.<sup>11</sup> Reversing this decline will be important in enabling the UK’s defence industrial base to innovate and

deliver cutting-edge defence capabilities, as well as achieve broader prosperity and social value benefits. While some of this increase will undoubtedly come from private sector spending, the UK’s ability to set a research agenda and communicate Defence’s priorities and goals will play a key role.

Government and external observers, therefore, need to carefully track progress on R&D investment to ensure that both its volume and its targets are appropriate to support the core objective of developing superior defence capabilities. Additionally, the UK is not the only country recently to see the need for a push on defence R&D – partners and market competitors have done so too. European efforts in this area have been significant in recent years, with the EU26 increasing their defence equipment spend by 50 per cent, and defence R&D spend by 14 per cent between 2005 and 2020, if from a relatively low base.<sup>12</sup>

## Defence imports challenge

Based on the World Military Expenditure data by the US Department of State, the UK ranks fourth in the world in the value of defence exports, ranking behind the United States, Russia and France, and ahead of China and Germany.<sup>13</sup> Most recent available data shows that the value of UK total defence exports between 2015 and 2019 was about \$20.2bn (£14.9bn), compared with France's \$32.7bn (£24.2bn), Germany's \$16.7bn (£12.4bn), China's \$23.6bn (£17.5bn), Russia's \$54.6bn (£40.4bn) and \$800.8bn (£592.6bn) for the US.<sup>14</sup> It is clear, therefore, that the UK continues to be one of the biggest world arms exporters.

However, it is also worth noting that the UK is simultaneously one of the biggest world arms importers. Between 2015 and 2019, the UK imported about \$41bn (£30.3bn) worth of arms imports, in comparison with France's \$4.8bn (£3.5bn), Germany's \$6.8bn (£5bn), China's \$5.5bn (£4.1bn), Russia's \$0.6bn (£0.4bn) and the United States' \$25.3bn (£18.7bn).<sup>15</sup> In relative terms, therefore, the UK exports considerably less than it imports. This is shown in detail in Table 2: between 2009 and 2019, for

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every £3 of equipment or services exported, the country had roughly £10 worth of defence imports. According to US Department of State figures, between 2009 and 2019, the UK was the third largest defence importer globally, behind only Japan and Saudi Arabia.<sup>16</sup>

Table 2: Arms export/import ratio, 2009–2019

Country	Global rank	Ratio (A(exports) / A(imports))
United States	1	28.506
Russia	2	22.048
France	5	3.968
Sweden	9	1.725
Germany	14	1.261
UK	27	0.361

SOURCE: WMEAT (2021, Table IId). Values given in billions of constant 2019 dollars, rounded to the nearest \$0.1 billion (\$100 million).

Imports are not inherently problematic: they can enable the UK to purchase the best equipment or conduct more cost-effective procurements, for example by increasing competition for domestic firms. Additionally, they can serve to strengthen bilateral or multilateral partnerships. These offer political benefits, as well as reduced unit costs (through economies of scale on combined orders) and improved interoperability with allied militaries. However, the discrepancy between the UK and its neighbours is considerable, as shown in Table 2. Pre-Brexit, the UK accounted for just under half of all EU defence imports in 2017, while also accounting for about 24 per cent of

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As the UK looks to maintain operational independence, its reliance on imports should be examined in greater detail to identify where there may be options to develop sovereign capabilities – both military and industrial – to enhance resilience and improve mission assurance long term.

total EU defence spending,<sup>17</sup> a reliance that has not been matched by any other major European defence power. Its import–export ratios then dropped off in the next decade from 1.246 in 1995 to 0.51 in 2005.<sup>18</sup>

The UK acquires 90 per cent of its defence imports from the United States, cementing an already strong set of defence, security, intelligence and industrial ties between the two countries.<sup>19</sup> While this figure does represent a modest decrease over the last two decades,<sup>20</sup> it still presents a significant caveat to the UK’s stated aims of leveraging its defence exports to bolster its position on the international stage. While, undoubtedly, purchases from the United States come with considerable advantages, including interoperability with US forces, they also entail a level of dependency.<sup>21</sup> Much of the US-imported equipment and systems are subject to significant restrictions in terms of alterations, repairs and further exports due to falling under

the Arms Export Control Act and International Traffic in Arms Regulations (ITAR), which enables the United States to maintain close control over the use and reexport of any US technology. Should the UK and the United States see their respective priorities diverge, the latter’s control over the UK’s significant volume of imports could make it difficult for the UK to ensure freedom of action. As the UK looks to maintain operational independence, its reliance on imports should be examined in greater detail to identify where there may be options to develop sovereign capabilities – both military and industrial – to enhance resilience and improve mission assurance long term.

## Conclusion

In the DSIS, the MOD has set out a much-needed reformulation of defence industrial strategy that seeks to better support the realisation of a ‘Global Britain’ capable of anticipating and responding to a variety of challenges around the world. As the DSIS celebrates its first year of life, the ambitions articulated therein should be applauded.

However, as with any strategy, its publication is only the first step of many, with the challenging task of implementation now at hand. This will require using the necessary evidence and data to inform acquisition decision making, to invest in skills and to clearly articulate what value UK Defence brings and what role the defence industrial base as a strategic asset plays in realising this value.<sup>22</sup> Learning from past successes and mistakes made by the MOD, as well as other government departments and allies and partners, can help anticipate likely implementation hurdles in the future. While general enablers such as strong leadership, investment in skills, clear communication, cultural change, data collection, and the identification of lessons and best practices will be necessary, areas such as defence R&D and export promotion will likely require focused and sustained attention as a matter of priority.

## Notes

- <sup>1</sup> UK MOD (2021).
- <sup>2</sup> UK MOD (2012).
- <sup>3</sup> HM Government (2021).
- <sup>4</sup> HM Government (2021).
- <sup>5</sup> UK MOD (2021).
- <sup>6</sup> These include capabilities that are strategic imperatives: nuclear deterrence capabilities, submarines, cryptography and offensive cyber as well as a range of technologies and capabilities to enable operational independence in combat air, maritime, complex weapons and general munitions. Source: UK Ministry of Defence (2021).
- <sup>7</sup> UK Ministry of Defence (2020).
- <sup>8</sup> Retter et al. (2021).
- <sup>9</sup> Muravska et al. (2021).
- <sup>10</sup> Bowns (2006, 92); Bowns (2010).
- <sup>11</sup> Eurostat (2019).
- <sup>12</sup> European Defence Agency (2021).
- <sup>13</sup> The ranking is based on an 11-year mean rank in total value of arms exports (goods and services). Source: US Department of State (2021). Country Rankings & Trends.
- <sup>14</sup> Calculations based on US Department of State (2021) data, Table II.e. Currency conversion uses average exchange rate (USD-GBP) over 2015–2019.
- <sup>15</sup> Calculations based on US Department of State (2021) data, Table II.e. Currency conversion uses average exchange rate (USD-GBP) over 2015–2019.
- <sup>16</sup> US Department of State (2021), Country Rankings & Trends.
- <sup>17</sup> European Defence Agency Defence Data, 2005-2017e.
- <sup>18</sup> US Department of State (2005), Country Rankings & Trends.
- <sup>19</sup> US Department of State (2021).

<sup>20</sup> US Department of State (1997). Between 1994 and 1996, US products constituted 98 per cent of UK imports, the second highest number for any single country after Japan.

<sup>21</sup> Dorman, Taylor, Uttley & Wilkinson (2020).

<sup>22</sup> Black et al. (2021).

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## About this Perspective

This Perspective provides a brief overview of the core principles of the Defence and Security Industrial Strategy (DSIS) published in March 2021, before reflecting in more detail on two aspects underpinning the Strategy's assumptions: research and development (R&D) and exports. This commentary draws on a body of RAND Europe research on the UK defence industrial base, R&D and technology and provides the authors' reflective perspective on areas of emerging challenges for DSIS implementation.

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