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A benefit, not a burden

The security, economic and strategic value of Britain's defence industry

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Preface

A benefit, not a burden **is the first in a series of policy pamphlets published by the Policy Institute at King's College London to stimulate debate on contemporary, and often controversial, policy issues.**

The series of pamphlets will act as a vehicle for leading thinkers and practitioners associated with the Policy Institute to share their insights with a broad community of policymakers, academics, journalists, business leaders and the public.

While all reports in this series reflect the views of their authors alone, they remain true to the ambition of the Policy Institute to champion the application of robust evidence in formulating policy. All reports are peer-reviewed, and I am grateful to the reviewers for their insightful and invaluable comments on this paper. I am also immensely grateful to Lord Sterling of Plaistow, who funded this project.

In this paper, the authors explore the military, economic and security value of Britain's defence industry. Based on the best available evidence, the authors argue that the domestic defence industry provides key benefits to the UK. Militarily, it ensures a secure and agile supply chain, capable of meeting the demands of a fast-changing, uncertain world.

But, the authors argue, the benefits go beyond the military and technological advantages. The research suggests that the UK's defence industry also provides significant economic value to the UK in terms of domestic employment levels, high-technology skills and financial contributions.

However, the authors also note that key official data on the economic and security benefits of the UK's defence industry are no longer collated – with the corollary that the Government is not able to conduct rigorous analysis of the potential benefits of the domestic defence industry on the one hand, nor to exploit them to the advantage of the UK on the other. As such, the report concludes that there may be opportunities to improve the UK's defence and economic wellbeing which are currently being missed.

As the next spending review, and defence and security review loom on the horizon, the recommendations of this report are both timely and important.

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Headline findings

1. **A domestic defence industry matters. The UK's defence industry is a leading-edge, high-technology sector that provides key military benefits to the nation's security by ensuring a secure, assured and agile supply chain which is developed and maintained over the long term. Without a thriving domestic defence industrial base with the capacity and capabilities to provide this, the UK jeopardises its freedom to act in an unstable, fast-changing world.**

Our findings suggest that an onshore defence industry is required to underpin a secure, assured and agile supply chain that can meet the government's objectives to 'build a secure and resilient UK and to help shape a stable world'. While we recognise that the UK cannot afford to maintain a complete 'cradle-to-grave' defence industrial base in all areas, there are specific military capabilities and technologies which are critical if the UK is to retain the ability to use its military forces as and when it desires.

Correspondingly, without a vibrant and thriving domestic defence industrial base to provide this, there is a risk that the UK will jeopardise its freedom to act in an unstable, fast-changing world. Moreover, there is the very real risk that British forces may lose their technological advantage over their potential opponents. We therefore recommend that the government clearly distinguishes between those UK military capabilities where domestically sourced capabilities are necessary to ensure freedom of action and those where reliance on foreign sources is acceptable. We further recommend that the Research and Development (R&D) element of defence spending is protected and ideally expanded.

2. **There is a lack of data and analysis. To make valid and rational decisions in the forthcoming spending and defence reviews, there is an urgent need for detailed data on the impact of defence spending within the UK economy. However, there is a dearth of data and rigorous analysis concerning the scale, scope and nature of the economic return of defence expenditure in the UK defence industrial base. Without this data it is difficult – for the government or independent analysts – to conduct rigorous analysis on the implications of spending decisions on the UK economy and how best to use available resources to achieve the maximum benefit.**

One of the most surprising outcomes of the research is that the Ministry of Defence (MoD) has significantly reduced the scope and coverage of statistics and data in three areas: i. on MoD expenditure with the UK defence industry, ii. on the wider domestic economic and employment impact of that expenditure and iii. on the security and economic benefits of defence exports. This worrying state of affairs is a consequence of the fact that the MoD does not consider wider employment, industrial or economic factors in its value-for-money assessments of procurement alternatives. This sits in stark contrast to the situation in France and the US, where major projects entail a cross-departmental approach that focuses on cost and value to the nation as a whole and where mechanisms are in place to measure the cross-government impact of defence contracts going overseas.

Our findings suggest that without this data it is difficult – for the Government or independent analysts – to conduct rigorous analysis and on how any economic benefits of a domestic defence industrial base can be fully identified and exploited. Our analysis also suggests that without this data, government procurement choices

may be substandard, with potential implications for the nation's overall defence and economic wellbeing.

3. **The domestic defence industry supports and creates highly skilled jobs and strengthens the economy. MoD expenditure within the UK defence industrial base and beyond provides significant economic value to the UK in terms of domestic employment levels, high-technology skills and financial contributions.**

Our research suggests that the UK's onshore defence industry provides a range of economic and employment benefits to the UK and is well situated in comparison to other manufacturing sectors to contribute towards national economic growth and recovery. The UK defence industry is a significant domestic industrial sector that directly employs 162,400 people, indirectly generates a further 114,200 jobs in the defence supply chain and supports a further 95,800 induced jobs in the UK economy.

It is a leading edge, high-technology and high-value sector: over half of the employees in UK defence companies are involved in R&D (22 per cent) or engineering and production and assembly (31 per cent). The industry's turnover in 2013 was an estimated £22.1 billion and it returned approximately £8.2 billion in gross value added to the UK economy. Our findings also suggest that the UK defence industry forms a vital national hub generating science, technology and skills within the national workforce.

However, in the absence of official data, it is not possible to provide rigorous, robust calculations of the full economic and employment benefits to the UK. We therefore recommend that the Government conducts or commissions a systematic study that identifies the net economic benefit and costs of onshore defence industrial activity to the UK. We further recommend that the study should identify the aggregate economic and technological value provided by the UK supply chains that support the activities of the MoD and its prime contractors, and wider contributions to national innovation and the 'knowledge economy'.

4. **Defence exports deliver national security benefits as well as export revenue and the development of leading edge technology. UK defence exports help to achieve national security and defence objectives by providing the UK with influence and leverage over other states which can be deployed in pursuit of foreign and security policy goals.**

A key observation that emerged from our research was that defence exports can provide the UK with influence and leverage over other states which, as we demonstrate, can be deployed in pursuit of foreign and security policy goals. As we also show, the symbolic importance attached to arms transfers can provide an opportunity for the UK to signal its political approval of friendly nations and increase their levels of military capability and self-reliance.

Although the research could not identify any official studies that quantify the net security gains from export-led security relationships, there is evidence to suggest that defence exports also make a considerable economic contribution to the UK. The UK has retained a 20 per cent share of the global defence export market over the last decade and currently remains the second highest world defence exporter behind the USA, winning orders worth £9.8 billion in 2013. However, we recognize that there are security, economic and ethical implications of defence exports which render them a contested area of UK public policy.

1 | Introduction

1 | Introduction

We live in uncertain times. In the last five years, revolution has rippled across the middle east and North Africa in the form of the Arab Spring. Libya has experienced a bloody civil war. In Syria and Iraq, Islamic State, with its significant funding and penchant for brutality, has caused havoc, devastation and bloodshed. West Africa is suffering from the Ebola crisis and although it is tapering off, it is still very far from over. The Russian-sponsored insurgency in eastern Ukraine poses a threat to long-term stability on the borders of Europe.

Against this backdrop, the UK's requirement for so-called 'hard power' clearly remains. Indeed, since the end of the Cold War, the UK's armed forces have supported the UK's national interests on numerous occasions, ranging from the liberation of Kuwait in 1990-91, to supporting the UN, NATO and the EU in the Balkans from the early 1990s, engaging in wars in Afghanistan and Iraq, contributing to evacuation operations around the globe, most recently in south Sudan in 2013, and providing assistance to the government of Sierra Leone in its fight against Ebola.

Whilst we live in uncertain times, we also live in austere times; we now have less money for our armed forces – and get less for our money. Since 2010, the defence budget has been cut by 7.5 per cent, the MoD has been forced to reduce its overcommitted equipment budget and the costs of replacing the existing nuclear force of four Trident submarines are now included in its budgeting process.[1] To compound the problems of a smaller defence budget still further, defence equipment and personnel are becoming ever more expensive and this has made the UK's defence industrial base a popular target for criticism.[2] Indicative of this is the fact that since the Boer War the individual cost of personnel has increased by approximately 2 per cent per year in real terms. Moreover, since 1945 the unit production cost of major weapons systems, from tactical combat aircraft to guided missiles and submarines, has increased by up to 10 per cent in real terms.[3] This, in part, explains recent calls for the UK to peg its defence budget to the NATO guideline of 2 per cent of GDP.[4]

This report argues that if, to coin a phrase from the National Security Strategy (NSS), we aspire 'to build a secure and resilient UK and to help shape a stable world', then we also need a defence industrial base that is capable of providing appropriate capabilities and equipment for our armed forces to meet this aspiration.

This requires a secure supply chain. Without this, the UK may find itself increasingly restricted by the willingness of off-shore suppliers and their respective governments to support the scope and scale of operations the UK can conduct. Moreover, without a secure supply chain, the UK is likely to be limited in the variety of challenges it can meet and hampered in the agility with which it can respond to fast-changing

1 There has been much debate about the size and in some cases the very existence of these costs. The most often quoted amount has been £38bn which was based on a non-partisan National Audit Office report. See National Audit Office, *Ministry of Defence: The Major Projects Report 2009*, HC.85-I, Session 2009-2010, London, The Stationery Office, 2009, p. 4.

2 See, for example, L. Page, *Lions, Donkeys and Dinosaurs: Waste and Blundering in the Military*, London, Arrow Books, 2007; B. Kincaid, *Changing the Dinosaur's Spots: The Battle to Reform UK Defence Acquisition*, London, RUSI, 2008.

3 See, for example, D. Kirkpatrick and P.G. Pugh, 'Towards Starship Enterprise – Are Current Trends in Defence Unit Costs Inexorable?', *Aerospace (Journal of the Royal Aeronautical Society)*, May 1983, pp. 16-23. See, also, D. Kirkpatrick, 'Rising Costs, Falling Budgets and their Implications for Defence Policy', *Economic Affairs,* Vol. 17, No. 4, 1997, p. 11. For alternative estimates, see N. Davies, E. Eager, M. Maier and L. Penfold, 'Intergenerational Equipment Cost Escalation', *Defence Economics Research Paper*, London, Ministry of Defence, 2012.

4 See, for example, Lord Attlee et al., 'Defence spending', *The Times*, 14 March 2015, p. 26.

circumstances. As this report argues, there are actually advantages to such a supply chain that go beyond security and defence: a thriving defence industrial base also benefits the UK's economy and can contribute to its long-term success.

The purpose of the report

This report was commissioned by Lord Sterling of Plaistow and Nick Butler in the run-up to the forthcoming review of public expenditure as part of the 2016 Spending Review. It was funded by Lord Sterling of Plaistow and explores the extent to which the domestic industrial base not only underpins the UK's defence and security but also contributes to a prosperous and successful UK economy. The research team was asked to produce an independent, rigorous, peer-reviewed assessment of the best available evidence on the role of the defence industrial base in three respects:

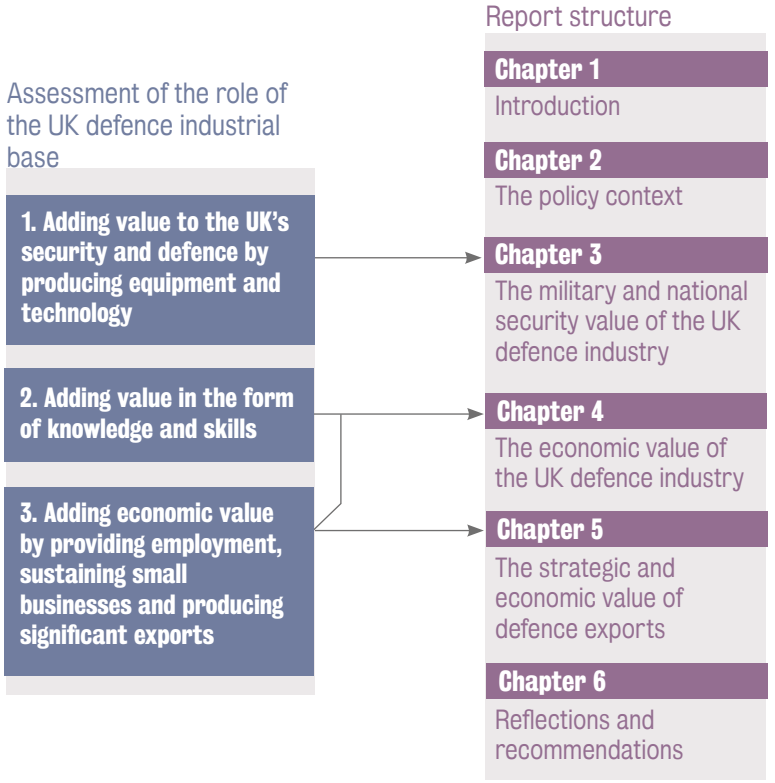
1. As an integral and indispensable part of any defence strategy - producing equipment, technology and know-how which underpins the UK's capabilities across the entire range of defence and security activities from armed conflict to peacekeeping, and from counter-terrorism to cyber security.
2. As a source, developed through the universities as well as within the defence companies themselves, of important and valuable advances in knowledge and of skills which have significant applications in the wider economy.
3. As a significant positive contributor to the economy as a whole, providing employment across the country, sustaining thousands of small, innovative and creative businesses and producing significant export earnings.

In order to analyse these points, we collected data in three phases. The first phase comprised an on-line bibliographic search to identify the population of government documents, articles, statistics and other published material relating to the UK defence industrial sector and defence acquisition. The second phase involved a series of discussions with officials and industry representatives in order to clarify aspects of published official and non-official statistics concerning the

Structure

The remainder of this report falls into five sections, summarised in Figure 1. Chapter 2 provides an overview of the policy context concerning defence procurement and the domestic defence industrial base. Chapter 3 presents an analysis of the available evidence relating to the military, defence and security benefits of a defence industrial base. Chapter 4 explores the economic benefits provided to the UK by its onshore defence industrial base. Chapter 5 lays out the economic, diplomatic and strategic benefits derived from exports developed through the UK's defence industry. In the sixth and final chapter, we provide some final reflections and recommendations based on the research.

Figure 1: Project structure



UK defence industry. The final phase involved the synthesis of the main research findings and identification of the key recommendations.

Caveats

There are two major caveats we wish to identify at the beginning of this report, the first relating to the context of this study and the second to the evidence base. The first is that it is important to acknowledge that there are a number of potential security, economic and ethical choices and trade-offs associated with arms exports and the wider domestic defence industry. From the outset, we recognise that these render this a highly contested area of UK public policy.[5] We do not cover these in detail in this report as they fall outside the scope of the review and the timescale of the research. However, it would be remiss not to acknowledge that there are considerations that go beyond the purely security, economic and strategic benefits of a domestic defence industrial base.

The second challenge concerns the evidence base and, specifically, the availability and accessibility of government data relating to the UK defence industrial base. In 2009, the MoD ceased publishing statistics on the estimated direct and indirect domestic industrial employment implications of its expenditure as well as industrial employment derived from UK defence exports. Indeed, as far as we are aware, the Aerospace, Defence, Security, Space (ADS) Group's 2014 'UK Defence Industry Outlook' is the only document that has captured sector-wide UK employment data since 2009.[6] Whilst this provides a wealth of data and has been a fruitful source, ADS is an industry organisation and its findings must be treated in that light. The lack of official data was exacerbated by the relatively short time available for the research (about 8 weeks in total). Indeed, we spent considerable time seeking alternative sources of data, with limited success. Whilst this was a real difficulty for the research, it also forms the basis of a major finding – namely, that any future review of UK onshore defence industrial capacity should be informed by a robust government-endorsed evidence base covering the national strategic, operational and economic implications of the MoD's equipment procurement choices and government-mandated defence exports.

Definitions

The term 'defence industrial base' is frequently employed as a shorthand in analyses of the defence-industrial sector, but it has no universally accepted definition. This stems from significant and long-standing conceptual[7] and empirical difficulties[8] in defining, delineating and measuring defence-related production. At the conceptual level, in most developed industrialised states, the defence industrial base is held up as 'a central part of national defence policy', but the concept 'has been the victim of various definitions, meaning different things to different people'.[9] This reflects several factors that complicate production of a robust distinction between those sectors of industrial activity relating to military and non-military expenditure.

Several approaches can be employed to distinguish defence and non-defence activity, each with their own analytical

5 On the economic dimension see, for example, K. Hartley, F. Hussain and R. Smith, 'The UK Defence Industrial Base', *Political Quarterly*, Vol. 58, No. 1, January-March 1987, pp. 62-72; R. Smith, A. Humm and J. Fontanel, 'The Economics of Exporting Arms', *Journal of Peace Research,* Vol. 26, No. 3, 1985, pp. 239-247; M. Chalmers, N.V. Davies, K. Hartley and C. Wilkinson, *The Economic Costs and Benefits of UK Defence Exports*, Research Monograph Series 13, Centre for Defence Economics, University of York, November 2001. On the ethical dimension see, for example, C. Havemann, 'Ethical Business Around the World: Hawks or Doves? The Ethics of UK Arms Exports', *Business Ethics*, Vol. 7, No. 4, October 1998; P. Eavis and O. Sprague, 'Does Britain Need to Sell Weapons?', in J. Gittings and I. Davis, *Britain in the 21st Century: Re-Thinking Defence and Foreign Policy*, Nottingham, Spokesman, 1996, p. 128; G. Maitland, 'The Ethics of the International Arms Trade', *Business Ethics*, Vol. 7, No. 4, October 1998, p. 203.

6 Aerospace, Defence, Security, Space (ADS) Group , 'UK Defence Industry Outlook 2014', January 2015, https://www.adsgroup.org.uk/pages/81396120.asp (accessed 2 April 2015).

7 See T. Taylor and K. Hayward, *The UK Defence Industrial Base: Development and Future Policy Options*, London, Brassey's, 1989.

8 On the empirical challenges, see K. Hartley and N. Hooper, *Study of the Value of the Defence Industry to the UK Economy: A Statistical Analysis for DTI, MoD, SBAC and DMA*, Centre for Defence Economics, University of York, December 1995.

9 For an extended discussion, see T. Sandler and K. Hartley, *The Economics of Defense*, Cambridge, Cambridge University Press, 1995, p. 182.

benefits as well as limitations.[10] One way is to define the defence industrial base as the provider of all the products, goods and services bought by the MoD and the armed services. Though this definition captures all the purchases made by the MoD as a *client*, it lacks discrimination because it fails to distinguish items that are specific to the armed services from those used in the civilian economy.

A second approach distinguishes between *non-specialised* and *specialised products* purchased by the MoD. Here, the defence industrial base is defined as that part of the economy providing specialised defence equipment used only by the military, involving distinct and separate production systems and excluding non-specialised goods requiring little transformation purchased directly from the civilian economy. Though this provides a more meaningful distinction between defence and non-defence purchases, it fails to capture the degrees to which products fall into the non-specialised and specialised categories.

A third approach discriminates *final uses* for products purchased by the MoD in terms of whether or not they are designed unequivocally for military use (eg nuclear submarines) or not (eg transport aircraft). An issue with this is how to treat a range of items that are critical enablers for the delivery of military capability, such as communications, satellite and surveillance equipment.

A fourth approach defines the defence industrial base in terms of the reliance of suppliers on MoD contracts. 'Defence contractors' are defined as those firms that are highly dependent on domestic defence sales. A limitation of this is identifying the percentage of a company's defence activity that constitutes the threshold for categorisation as a 'defence firm'.

Acknowledging these constraints, this study focuses primarily on defence-related production and international transfer of the most complex defence-specific systems, particularly complete platforms (eg combat aircraft, warships and submarines). These systems require the integration of items available in commercial markets and defence-specific sub-systems. The key characteristics of these products are high unit cost, substantial technical risk and limited sources of supply. These product types are not available in commercial markets but include production from firms with varying degrees of dependence on defence contracts in terms of their overall corporate sales. This emphasis still allows for general conclusions to be drawn in relation to the MoD's defence-related purchases and exports of low-cost commercially available items and intermediate-scale sub-systems and stand-alone weapons.

In this study, we use the definition employed by successive UK governments since 2002, namely that the 'UK Defence Industry' encompasses 'all defence suppliers [to the MoD and export markets] that create value, employment, technology or intellectual assets in the UK' including 'both UK- and foreign-owned companies'.[11] The UK domestic industry is therefore 'defined in terms of where the technology is created, where the skills and intellectual property reside, where jobs are created and sustained, and where the investment is made'.[12] This definition was adopted because it captures the spectrum of domestic firms supplying goods and services to the MoD and because it provides criteria that differentiate the 'UK defence industry' from 'foreign' sources of supply.

It is also worth noting that while we focus primarily on the UK defence industry, the UK possesses a large and innovative domestic 'security industry', which creates products and services relevant to 'homeland security (largely counter-terrorism), law enforcement, other emergency response services (including fire), commercial security and safety, critical national infrastructure protection, cyber security, as well as other services including consultancy and guarding, and the management of large scale events'.[13] The security

10 See J. Molas-Gallart, *Military Production and Innovation in Spain*, Reading, Harwood Academic Publishers, 1992, pp. 26-29.

11 Ministry of Defence, 'Defence Industrial Policy', *MoD Policy Paper No. 5*, 2002, p. 4.
12 *Ibid*., p. 9.
13 UK Trade & Investment and Home Office, *Increasing our Security Exports: A New Government Approach*, February 2014, p. 6, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/328120/UKTI_Security_Exports_Brochure_update.pdf (accessed 24 March 2015).

industry is an important element of the UK economy creating approximately 165,000 jobs in 11,500 companies and a major contributor to UK national security. This report does not focus directly on the security industry as a separate sector, but because many of the arguments relating to the defence industry apply to it, we refer to it where relevant.

2 | The policy context

2 | The policy context

A regular parliamentary cycle of defence and security reviews was established by the Coalition in 2010 and the first Strategic Defence and Security Review (SDSR) took place that year in parallel with the 2010 National Security Strategy (NSS).[14]

Formulated against the backdrop of the government deficit reduction strategy and the 'black hole' in the UK defence budget, the SDSR was an explicitly 'risk-based' defence policy.[15] It was predicated on five interrelated assumptions, namely that:

1. the UK would complete its withdrawal from Afghanistan by 2015
2. there would be no requirements for any major new UK military deployments before 2020
3. the MoD could proceed with a decade-long programme of defence transformation with the aim of developing the capabilities required for 'Future Force 2020'
4. until the UK government achieved its overall national debt reduction targets (planned for 2015), the MoD would accommodate a departmental spending reduction of 7.5 per cent and 'balance' the defence budget through efficiency measures, including reductions in military personnel, removal of capabilities and delays to the Trident nuclear replacement programme[16]
5. cost-overruns on the defence equipment plan inherited by the Coalition would be eliminated by 2015 through a combination of efficiency measures and the provision of annual 1 per cent increases in procurement funding[17]

Although the 2010 SDSR was full of good intentions, all has not gone as anticipated. Far from avoiding new operations, the UK's armed forces have engaged in Libya (2011), Iraq (2014-) and Sierra Leone (2014-). Furthermore, while combat forces have been withdrawn from Afghanistan, the intended 'Future Force 2020' reconfiguration remains to be addressed over the course of the next Parliament. Moreover, the planned elimination of the current account deficit by 2015 has not, as yet, occurred and under the 2015 budget it will not be achieved until 2018.[18]

Running hand-in-hand with this has been concern about some of the capability gaps accepted as temporary measures in the 2010 SDSR. Two in particular, stand out. First, the loss of the maritime patrol aircraft capability following the cancellation of the Nimrod MRA4 programme. This has received increasing prominence as a result of foreign submarines operating in UK territorial waters.[19] Second, is the question mark over the defence of the Falkland Islands following the loss of the carrier-based air defence capability.

14 HM Government, *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review,* Cm 7948, London, The Stationery Office, 2010, p. 9, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/62482/strategic-defence-security-review.pdf (accessed 19 March 2015). A more in-depth description can be found in HM Government, *A Strong Britain in an Age of Uncertainty: The National Security Strategy*, Cm 7953, London, The Stationery Office, 2010, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/61936/national-security-strategy.pdf (accessed 19 March 2015). See also, P. Cornish and A. Dorman, 'Complex Security and Strategic Latency: the UK Strategic Defence and Security Review 2015', *International Affairs*, Vol. 91, No. 2, March 2015, pp. 351-370, p. 353.

15 Cornish and Dorman, 'Complex security and strategic latency: the Strategic Defence and Security Review 2015', pp. 351-370.

16 D. Cameron, *Statement on the Strategic Defence and Security Review*, Hansard, 19 October 2010, http://www.publications.parliament.uk/pa/cm201011/cmhansrd/cm101019/debtext/101019-0001.htm#10101928000003 (accessed 21 March 2015).

17 The explicitly 'risk-based' nature of the SDSR was encapsulated in the government's recognition that some or all of these assumptions might be incorrect. For an extended discussion see T. Edmunds, 'British Civil-Military Relations and the Problem of Risk', *International Affairs*, Vol. 88,No. 1, 2012.

18 HM Treasury, *Budget 2015*, HC 1093, London, The Stationery Office, 2015, p. 22, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/413949/47881_Budget_2015_Web_Accessible.pdf (accessed 21 March 2015).

19 B. Farmer, 'Britain forces to ask NATO to track "Russian submarine" in Scottish waters', *The Telegraph*, 9 December 2014, http://www.telegraph.co.uk/news/uknews/defence/11283926/Britain-forced-to-ask-Nato-to-track-Russian-submarine-in-Scottish-waters.html (accessed 2 April 2015).

Indeed, in response to this, the government has recently announced a reinforcement package.[20]

To compound matters further, the 2016 Spending Review looks likely to involve much greater cuts to public expenditure. The defence budget, which is not currently protected, is likely to be a key target for these cuts.[21] Despite calls from outside the MoD for the protection of the defence budget[22], the working assumption within the Department is that it will again have to make significant cuts and rumours have already emerged of a further reduction in the size of the regular army by up to 30,000.[23] Any such cuts are likely to have an adverse impact on current assumptions in the MoD's *Defence Equipment Plan 2014*, which outlines the armed services' equipment and equipment support requirements to 2024.[24]

At the heart of the problem is what *can* be cut whilst maintaining an appropriate military capability commensurate with the demands of the NSS. In essence, the MoD's budget consists of four elements: i. R&D investment, ii. infrastructure (ie land and buildings used to support defence such as service

20 BBC News, 'Lord West: the UK couldn't recapture Falklands from Argentina', *BBC News*, 31 January 2012, http://www.bbc.co.uk/news/uk-politics-16812442 (accessed 7 April 2015). In actual fact, the ability to retake the Falklands, if they were lost to Argentina again, was lost under the previous administration in 2004 when the decision was taken to remove the Sea Harrier from service, thus leaving the UK without an air defence fighter for its aircraft carriers. The F-35B will have an air defence capability when it enters service aboard the new aircraft carriers. Weaver, M., 'Britain to bolster Falklands defence because of 'increased threat',' *Guardian Online*, 24 March 2015, http://www.theguardian.com/uk-news/2015/mar/24/britain-to-bolster-falklands-defences-reports-say-due-to-increased-threat (accessed 14 April 2015).

21 Institute for Fiscal Studies, *IFS Post-Budget Briefing 2015*, London, Institute for Fiscal Studies, p. 1, http://www.ifs.org.uk/uploads/budgets/budget2015/budget2015_pj.pdf (accessed 21 March 2015).

22 See, for example, Lord Attlee et al., 'Defence spending', *The Times*, 14 March 2015, p. 26.

23 P. N. Cornish and A. Dorman, 'Fifty Shades of Purple: Preparing for the 2015 Strategic Defence and Security Review', *International Affairs*, Vol. 89, No. 5, September 2013, pp. 1183-1202; M. Chalmers, 'Mind the Gap: the MoD's Emerging Budgetary Gap', *RUSI Briefing Paper*, London, RUSI, 2015, https://www.rusi.org/downloads/assets/201502-BP-MoD-Emerging-Budgetary-Challenge.pdf (accessed 21 March 2015).

24 Ministry of Defence, *The Defence Equipment Plan 2014*, London, Ministry of Defence, 2015, p. 4, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/396102/20150112-EP_Plan_Document-Final_OS_to_PDF_version-2-1.pdf (accessed 23 March 2015).

housing, ranges and airfields), iii. personnel costs, and iv. equipment and support (ie new equipment plus associated spares, munitions etc). In times of austerity, governments have tended to seek savings across all four financial streams as part of a 'salami-slicing' approach.

One consistent way to do this is by reducing the amount spent on R&D knowing that there is likely to be little impact on short term capability. However, in the longer term this places at risk the continuing technological lead of Britain's armed forces against potential opponents and thus threatens a successful outcome in future operations. Studies have shown that reductions in the investment in R&D are on average felt some 25 years later and that technological inferiority on the battlefield can often result in higher casualties.[25]

Another approach has been to rein in expenditure on infrastructure by reducing the size of what is known as the 'defence estate' and delaying upgrades and improvements. While there will undoubtedly be calls for further reductions, there is a basic requirement for facilities which means that the MoD will need to keep quite a large holding. Moreover, the MoD's entitlement to sell such assets is often limited by the basis on which the land was originally obtained. The historical approach of deferring and delaying upgrades has meant that much of the service housing has been in a poor state and there has been a consistent effort over the last decade to try and put money into this area and improve the conditions for service families.[26]

Yet another way of finding savings has been to mitigate the rising cost of personnel (which, according to studies conducted within the MoD have increased by approximately 2 per cent per year in real terms since the Boer War) by reducing the number of regular personnel and supplementing regular troops with reservists to maintain capacity.[27] The result has been that

25 S. Bowns and S. Gebicke, 'From R&D to fighting power, 25 years later', *McKinsey on Government,* Spring 2010, pp. 71-76, http://www.technology-futures.co.uk/MoG5_DefenseR&D_VF.pdf (accessed 7 April 2015).

26 National Audit Office, *A defence estate of the right size to meet operational needs,* HC.70, Session 2010-2011, London, The Stationery Office, 2010.

27 Interview with defence official.

the armed forces are smaller than they have been in more than a century and they are struggling in some areas to provide personnel to operate equipment – such as a crew for the second aircraft carrier currently under construction at Rosyth.

In practice, this leaves the equipment and equipment support budget – £163 billion over the next decade – as the main target for expected defence cuts.[28] When it comes to procurement, the UK method for acquiring equipment on a value-for-money basis is, however, stretched between two opposing forces.

First, the unit production cost of major weapons systems has increased continuously in real terms since 1945.[29] Estimates suggest that the real unit costs of tactical combat aircraft have been growing at up to 10 per cent per annum, with similar rates of growth for guided missiles, submarines, frigates, attack helicopters and self-propelled artillery.[30] Though defence budgets in the UK and elsewhere have grown at the same time as equipment unit costs have been rising, budgetary increases have been smaller and 'only partially compensate for the concurrent escalation in the unit cost of defence equipment'.[31] A related trend has been significant increases in programme 'lead-times', or the time between project initiation and operational release to the armed services, as major defence platforms have been replaced.[32] Moreover, the stress on successive intergenerational performance enhancements has meant that major weapons system programmes have been characterised by increasing R&D intensity. The likelihood is that these intergenerational cost dynamics will place strain on the MoD's equipment acquisition over the next decade, particularly for downstream capability requirements that are yet to be contracted.

28 The budget is provided in, Ministry of Defence, *The Defence Equipment Plan* 2014, p.4.

29 See, for example, Kirkpatrick and Pugh, 'Towards Starship Enterprise – Are Current Trends in Defence Unit Costs Inexorable?'.

30 D. Kirkpatrick, 'Rising Costs, Falling Budgets and their Implications for Defence Policy', *Economic Affairs*, December 1997, p. 11. For alternative estimates, see Davies, Eager, Maier and Penfold, 'Intergenerational Equipment Cost Escalation'.

31 Kirkpatrick, 'Rising Costs, Falling Budgets and their Implications for Defence Policy', p.11.

32 See, for example, Kirkpatrick and Pugh, 'Towards Starship Enterprise – Are Current Trends in Defence Unit Costs Inexorable?'.

In direct opposition to growing costs and lead-times of procurement is the UK's ongoing desire to maintain a degree of national independence in terms of how and where the MoD sources the major defence systems and sub-systems it requires. In the Cold War, this led to the creation of largely separate national arms industries in the UK and elsewhere capable of developing and producing a range of advanced weapons systems domestically. National autonomy in weapons development and production was once viewed as a source of national independence, a means of achieving security of equipment supply and a way of tailoring equipment requirements to the precise needs of the armed services. Moreover, self-sufficiency was equated with national economic benefits in the form of domestic employment in high-technology sectors, support for balance of payments and tax revenues, as well as a source of technological 'spin-offs' that civilian industries could exploit.[33]

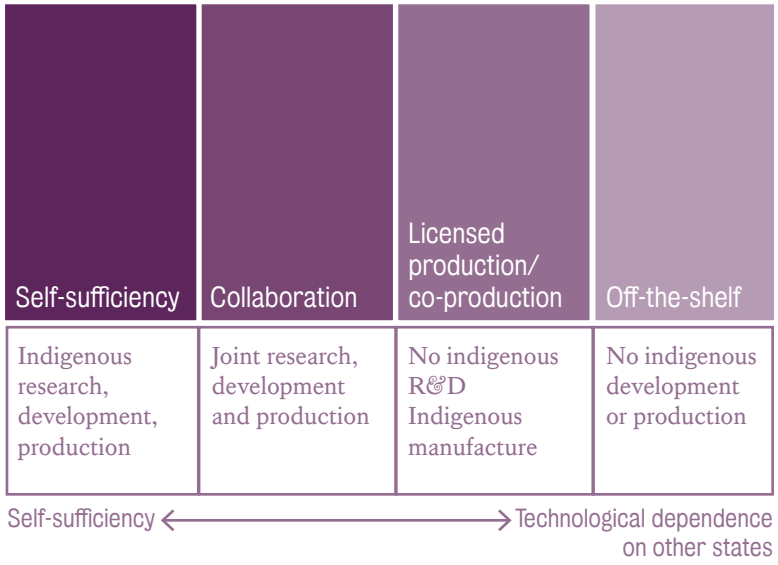
Taken together, the intergenerational cost profiles of major weapons systems combined with a desire for independence and security of supply, have limited – and continue to limit – the options available to the UK government if it is to achieve cost-effectiveness in acquiring state-of-the-art defence capabilities for the armed services. Indeed, successive governments have recognised that the UK 'cannot afford to maintain a complete cradle-to-grave industrial base in all areas'.[34]

33 See, for example, M. Uttley, 'Defence Procurement and Industrial Policies', in S. Croft, A. Dorman, W. Rees and M. Uttley (eds.), *Britain and Defence 1945-2000: A Policy Re-evaluation*, London, Longman, 2001, p. 117.

34 Ministry of Defence, *Defence Industrial Strategy: Defence White Paper,* Cm 6697, London, The Stationery Office, 2005.

In practice, this leaves three alternative procurement strategies if the UK is to meet its defence equipment needs (see Figure 2). The first is to avoid costly domestic research, development and production costs by importing complete weapons systems off-the-shelf (eg Boeing C-17 Globemaster III strategic lift aircraft). The second approach is 'international collaboration' (eg Eurofighter Typhoon), which involves pooling the research, development and production costs of new weapons systems with at least one other state. The third is 'licensed production or co-production' and involves avoiding domestic R&D, but manufacturing technologies designed elsewhere under license within the domestic defence industry (eg AgustaWestland Apache AH-1 attack helicopters).

Figure 2: Alternative acquisition strategies



A related factor that affects these procurement strategies has been the internationalisation of the major defence firms produced by the rising costs of major weapons systems and the desire for independence and security of supply.

Since 1990, significant developments have occurred in defence markets. National defence expenditures in the US and Europe declined significantly in the early 1990s as states sought 'peace dividends'. This led to a fall in unit demand for weapons platforms. Reduced equipment orders were instrumental in defence-industrial restructuring as governments and industries sought to achieve economies of scale in major weapons system development and production. In response, US government-induced restructuring during 1993 led to the merger and consolidation of the US defence industry into five major prime contractors: Lockheed Martin, Northrop Grumman, Raytheon, Boeing and General Dynamics.

Within Europe, the response was a gradual breakdown of national defence-industrial ownership patterns through government-mandated international company mergers, take-overs, cross-shareholdings, consortia and programme-specific joint ventures. This process has led to the current European defence-industrial ownership structure built around four major defence companies.[35] BAE Systems, Airbus Group,[36] Thales (formerly Thomson-CSF) and Finmeccanica. At the same time, these large multinationals have also sought to acquire subsidiaries in other nations. For example, BAE Systems acquired the US's sixth largest defence firm United Defense Industries; conversely, General Dynamics have established General Dynamics UK.

35 See H. Meijer, 'Post-Cold War Trends in the European Defence Industry: Implications for Transatlantic Industrial Relations', *Journal of Contemporary European Studies*, Vol. 18, No. 1, 2010, pp. 63-77; and, B. Schmitt, 'From Cooperation to Integration: Defence and Aerospace Industries in Europe', EU-ISS *Chaillot Paper No. 44*, Brussels, July 2000.

36 This was formerly called EADS (European Aeronautic Defence and Space Company). The EADS name was dropped in 2014 and rebranded as Airbus Group, which includes Airbus (for commercial aircraft), Airbus Defence and Space (effectively the original EADS) and Airbus Helicopters.

The internationalisation of major defence contractors has changed the way that recent UK governments have defined the domestic defence industrial base. In its 2002 *Defence Industrial Policy* the former Labour administration re-defined the term 'UK defence industry' to 'embrace all defence suppliers [to the MoD and export markets] that create value, employment, technology or intellectual assets in the UK' including 'both UK- and foreign-owned companies'.[37] The domestic industry was therefore 'defined in terms of where the technology is created, where the skills and intellectual property reside, where jobs are created and sustained, and where the investment is made'[38]. This was superseded by the 2012 *National Security Through Technology White Paper*, which set out the current government's preference for off-the-shelf procurement through open competition. Though it does not offer an explicit definition of a 'UK-based defence company', it recognises the requirement to 'look at the domestic and global defence and security market for products that are proven, that are reliable and that meet our current needs', which suggests that the key characteristics identified in the 2002 *Defence Industrial Policy* definition remain in place.[39]

Consequently, UK governments continue to recognise that onshore sourcing from the UK defence industry provides generic forms of military, economic, and strategic value that are not necessarily available through a reliance on the import of equipment or other forms of technology transfer from foreign-based suppliers. The subsequent sections of this report address the value of the UK defence industry in providing:

- Military and national security value. At issue here is the extent to which onshore UK sourcing of defence capability provides unique forms of military and operational advantage that cannot be derived through direct imports. The *2005 Defence Industrial Strategy* identified a range of sectors where indigenous industrial capacity was required for national security reasons to ensure 'appropriate sovereignty'. Similarly, the *2012 National Security Through Technology White Paper* acknowledged the need for 'action to protect the critical areas where the UK needs either an advanced technology to counter our adversaries or special products or services to maintain our freedom of action, particularly during operations'. A key issue for the next major review will be how and where the UK seeks to maintain forms of technological advantage and freedom of action through future procurement choices.
- Economic value. Successive governments have assumed that the UK defence industry is a generator of national employment, skills, investment and intellectual property that may not accrue through off-the-shelf imports. Critical issues here concern the extent to which the retention of a UK defence industrial capability provides national economic and technological gains and the extent to which MoD procurement choices should be informed by wider national economic and domestic employment considerations.
- Strategic value. In this sense, governments recognise that defence exports provide value to the UK in the form of economic benefits and as a tool with which to pursue wider foreign and security policy goals. Critical issues here concern the extent to which exports enable the UK to achieve forms of influence and leverage over recipient states and the extent to which arms sales provide domestic economic and employment benefits.

37 Ministry of Defence, 'Defence Industrial Policy', p. 4.
38 *Ibid*., p. 9.
39 Ministry of Defence, *National Security Through Technology: Technology, Equipment, and Support for UK Defence and Security*, Cm 8278, London, The Stationery Office, 2012. Italics added.

3 | The military and national security value of the UK defence industry

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UK defence industry provides defence and national security benefits to the nation, most importantly by permitting a greater freedom of action than would be the case if the UK was solely reliant on off-shore suppliers.

If the UK is to be both secure and resilient, whilst maintaining the freedom to shape and build a more stable world, it needs armed forces with the best equipment and technology. It also requires an industrial supply base that can adapt quickly to the changing priorities of the armed forces and increase production in times of crisis.

However, if the UK is to act as and when it chooses, there are political and security implications to defence procurement that significantly restrict what can be acquired and from whom. Some areas, such as nuclear warheads, will always require domestic provision because international law prevents export. Similarly, there are some areas that, although they could potentially be bought from another state, would leave the UK too vulnerable to the supplier nation. These include cryptography, some areas of C4ISTAR and cyber.[40] Moreover, in some other areas of procurement, potential suppliers are from unfriendly or potentially hostile nations or nations with a poor human rights record. In these cases reliance on acquiring equipment from such governments is often politically unpalatable.

In these areas, then, the UK needs a domestic defence industrial base which is capable of providing a secure supply chain to equip and maintain the armed forces. Without access to a secure supply chain the UK's armed forces will inevitably be limited in terms of the scope and scale of operations they can conduct. A good example of this is to be found in the deployment of UK armed forces to the NATO-led operation in southern Afghanistan in 2006. One of the many restrictions on the scope and scale of initial operations was the availability and capacity of the support helicopter force. Initially 6 Chinook helicopters were deployed and, though this was subsequently increased, tactical airlift nevertheless remained a real constraint on the freedom of movement of Britain's armed forces especially once the IED menace became more prevalent.[41] The problem was eventually alleviated by, amongst other things, buying 6 AgustaWestland EH-101 helicopters then entering service with the Danish armed forces, re-furbishing existing Sea King HC4s and belatedly ordering additional Chinook helicopters from the US. Nonetheless, in the immediate short term, the lack of helicopters restricted the scope and scale of British operations in southern Afghanistan.[42]

A domestic defence industry can provide the technological superiority that allows for freedom of action. The difficulty of buying technology off-the-shelf is that someone else retains ownership of that technology. For example, in acquiring the Apache AH1 helicopter from the US and building it under licence, the British Army does not have access to the source codes that allow it to fly.[43] This, in turn, means that if the UK wishes to add new capabilities to the helicopter to make it suitable for a new conflict or environment, it has to go back to the host country and supplier, in this case the US and Boeing, to negotiate and pay for any modifications to the aircraft. There is, of course, no guarantee that this will be allowed in all areas of defence procurement, particularly if it runs against the grain of the host's national or industrial advantages.

40 C4ISTAR stands for 'command, control, communications, computers, intelligence, surveillance, target acquisition and reconnaissance'.

41 See House of Commons Defence Select Committee, *Helicopter capability* Eleventh Report of Session 2008-09, HC 434, London, The Stationery Office, 2009, http://www.publications.parliament.uk/pa/cm200809/cmselect/cmdfence/434/434.pdf (accessed 7 April 2015).

42 See National Audit Office, *Support to High Intensity Operations,* Session 2008-2009, HC 508 London, The Stationery Office, 2009, http://www.nao.org.uk/wp-content/uploads/2009/05/0809508.pdf (accessed 26 March 2015).

43 Interview with defence official.

Technological dependence on others inherently means relying on both the supplying firm and the government of the country where it is based being willing to support the UK's armed forces. These factors therefore potentially impede the UK's technological superiority and freedom of action.

A secure supply chain delivered through an onshore defence industry provides the capacity required for the UK to retain freedom of action. The lack of industrial capacity to deliver defence products can severely limit a nation's ability to deploy and utilise its armed forces. For manufacturers, surplus capacity is a wasted asset. This issue of capacity is perhaps best illustrated by the UK's requirements for munitions over the last decade. For much of the preceding decade, the UK's armed forces had largely used munitions in training whilst maintaining a set level of war stock. The deployment into southern Afghanistan in 2006 led to a rapid rise in the consumption of munitions as British forces found themselves under repeated attack from the Taliban. In some areas, supplies ran low and there was a struggle to maintain sufficient munitions of an appropriate quality until industrial production was increased.[44] In this case, interim supplies were sourced from outside the UK, whilst domestic production was significantly expanded. In the longer term, the MoD signed a 15-year contract with BAE Systems to provide and maintain an ammunition production capability.[45] An unstable world means that defence needs can often vary significantly and require industry to maintain a capacity to ramp up production in a limited timeframe. Maintaining such capacity is inevitably less economical but operationally critical.

Freedom of action often means having the ability to respond to unexpected but serious events. This can involve modifying existing defence capabilities and equipment for new environments. One way to assess the defence supply base is

44 T. Harding, 'Cheap bullets put lives of paratroopers at risk', *The Telegraph*, 23 November 2006, http://www.telegraph.co.uk/news/uknews/1534916/Cheap-bullets-put-lives-of-paratroopers-at-risk.html (accessed 10 April 2015).

45 The Scotsman, 'BAE signs £3 billion ammunition contract with Ministry of Defence' *The Scotsman*, 21 August 2008, http://www.scotsman.com/business/bae-signs-163-3-billion-ammunition-contract-with-ministry-of-defence-1-1086879 (accessed 25 March 2015).

to consider not only the ability of industry to vary the scale at which it delivers but also its ability to change and adapt equipment as operations evolve and requirements change. Moreover, rapid adaptation in the field during operations requires a partnership between the defence companies and armed forces.

Taken together, these points suggest that the progressive loss of domestic industrial capabilities can and has jeopardised the UK's freedom of action and limited choices over when, where and whether to act. The inherent risk of open, off-the-shelf procurement is that other states may not be politically suitable providers of defence capabilities, they may not allow their own domestic manufacturers to sell others their best equipment and they may not share the knowledge and expertise that enable UK armed forces and security services to obtain maximum operating capacity of equipment.

This reflects a worrying reluctance to recognise the role of the domestic industrial base in providing and maintaining freedom of action and operational advantage. The definition of value-for-money in the 2012 *National Security Through Technology White Paper* does not take into account defence industrial factors. Ultimately, any off-the-shelf acquisition policy founded on such a definition will – in the long-term – risk undermining the UK's military and security capability. There is an urgent need to identify those military capabilities in which the UK must retain a technology advantage, and the associated technological and industrial capabilities that consequently need to be retained onshore.

4 | The economic value of the UK defence industry

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The UK's defence industrial capacity does not only provide value by supporting national security and stability through freedom of action and technological advantage over other states; it also provides economic benefits to the UK that are far from insubstantial.

These are acknowledged by the government. The 2012 *National Security Through Technology White Paper*, for example, observed that 'a healthy and competitive [defence] industry in the UK makes a significant contribution to developing and sustaining key defence and security capabilities, as well as contributing to export-led growth and a re-balanced economy'.[46] The government's operating definition of the UK defence industry indentifies the economic benefits, encompassing as it does, those defence suppliers to the MoD and export markets that create value, employment, technology or intellectual assets in the UK.

As Box A indicates, the MoD collects headline statistics on its expenditure in the UK's defence industrial base.[47] These are, however, headline statistics only. Part of the problem for any study of the economic value of the UK's onshore defence industrial base is that the MoD has significantly reduced the scope and coverage of statistics and data that it collects. Up to 2009, the MoD published annual estimates of national and regional full-time jobs in the UK that were dependent on MoD expenditure and defence exports. The annual statistics included estimates of 'direct' employment of contractors in receipt of MoD contracts and 'indirect' employment generated in the sub-contractor 'supply chain' supporting those contractors.[48] In 2009, the government decided that the MoD would no longer publish estimates for UK employment dependent on MoD expenditure and defence exports on the grounds that the 'data do not directly support MoD policy making and operations'.[49] It has been suggested that the decision was also a response to concerns that the data were being used to lobby on behalf of local and regional employment interests.

Box A: MoD headline statistics on 'the composition and scope of the [MoD's] expenditure, information on the impact of defence spending in the wider economy and compar[isons between] the MoD's spending to that of other departments and other countries'.

- Defence Spending totalled £34.6 billion in 2013/14 and was ranked as the fourth highest area of UK government expenditure behind Work and Pensions, Health and Education.
- The MoD spent just under £19.4 billion with UK industry and commerce in 2012/13. Manufacturing attracted just under half of this MoD expenditure.
- The MoD spent approximately £15.2 billion on the equipment and support programme with UK- and foreign-owned organisations during 2013/14, of which £6.4 billion was spent on capital infrastructure, £6.4 billion on equipment support and £2.4 billion on R&D. This represented approximately 44 per cent of the total £34.6 billion defence budget.

46 Ministry of Defence, *National Security Through Technology: Technology, Equipment, and Support for UK Defence and Security*, p. 12.

47 The figures in Box A are compiled from Ministry of Defence, *Annual Statistical Series 1 Finance Bulletin 1.01: Trade, Industry & Contracts*, 2014; Ministry of Defence, *Annual Statistical Series 1 Finance Bulletin 1.03: Departmental Resources,* 2014; *Ministry of Defence, Annual Statistical Series 1 Financial Bulletin 1.01a MoD Contracting with Small and Medium-sized Enterprises: Direct Expenditure 2013/14,* 2014.

48 See Ministry of Defence, *UK Defence Statistics Compendium 2009*, London, Ministry of Defence, http://webarchive.nationalarchives.gov.uk/20140116142443/http://www.dasa.mod.uk/publications/UK-defence-statistics-compendium/2009/2009.pdf (accessed 25 March 2015), Table 1.10. Figures rounded to the nearest five thousand.

49 Ministry of Defence, *UK Defence Statistics Compendium 2009*, p. 29.

- The MoD made payments to approximately 20,000 UK- and foreign-owned organisations in 2013/14. It spent £916 million directly with just over 7,000 different small and medium sized enterprises (SMEs), which accounted for 4.5 per cent of its total expenditure with industry. Approximately 41 per cent of total MoD procurement expenditure was with 10 suppliers. BAE Systems was the MoD's largest defence supplier receiving just under 14 per cent of all procurement expenditure in 2013/14.
- The MoD R&D expenditure is approximately £2.4 billion which accounts for around 40 per cent of UK government spending on R&D.
- The UK remains the second highest defence exporter in the world behind the US. Identified export orders of defence equipment and services were estimated to have reached their highest level in 2013 since the series began in 1988 - at just under £9.8 billion.

The formal justification for this decision stems from the definition of 'value-for-money' employed by the MoD in procurement decision-making, which is:

> ... the optimal combination of time, cost and effectiveness within available resources. It is a relative concept, which involves the comparison of potential and actual outcomes of different procurement options. Value-for-money for each programme is determined on a case-by-case basis, depending on circumstances. Non-quantifiable factors may be relevant to value-for-money assessments, such as the supplier's track record and financial robustness.[50]

50 Ministry of Defence, *National Security Through Technology: Technology, Equipment, and Support for UK Defence and Security,* p. 12.

The decision to discontinue the collection of employment data reflects the fact that the 'MoD does not consider wider employment, industrial or economic factors in its value-for-money assessments'[51]. The result has been that the last official MoD estimates of UK defence industrial employment were published in 2009 and refer to employment levels during 2007/08. Moreover, MoD statistical publications no longer differentiate between equipment and equipment support sourced from the UK or via direct imports.

Thus, although the government recognises that 'the defence and security sectors are an integral part of the UK's advanced manufacturing sector, supporting many high-skilled jobs and vibrant supply chains',[52] it does not appear that these economic benefits are being identified or fully exploited. In part, this means that surprisingly little systematic official analysis has been conducted into the scale, scope and nature of the economic value to the UK produced by MoD expenditure with the onshore defence industry, or the wider domestic economic and employment impacts arising if MoD contracts are placed with overseas suppliers.

In the absence of official published government reports into the UK defence industry, evidence of the economic value of a domestic defence industry is confined to those studies conducted or commissioned by the UK defence industry itself, or by academia. Indeed, to the best of our knowledge, these studies provide the best, indeed the only, publicly available rigorous analysis of the scale, scope and economic impact of the UK defence industry, the financial implications of MoD expenditure within British industry and the microeconomic effects of the major defence contractors.

51 *Ibid.*
52 *Ibid.*, p. 42.

The most recent survey of the UK defence industry is the 2014 *UK Defence Industry Outlook* report published by the ADS Group.[53] The significance of the ADS report is that it forms the basis of current government and industry assumptions concerning the scale and scope of current UK defence industrial employment.[54] ADS concluded that the domestic 'defence industry is a high-tech, high-value sector' that 'delivers world-leading capability that is vital to protecting UK national security and generating economic prosperity' on the basis of four key findings. The first is that the onshore defence industry is a significant domestic industrial sector because it directly employs 162,400 people, and generates a further 114,200 indirect jobs in the defence supply chain. Goods and services purchased by defence industry and supply chain employees support a further 95,800 induced jobs in the UK economy.[55]

Secondly, the defence industry is a high-tech and high-value sector: over half of the employees in UK defence companies are involved in R&D (22 per cent) or engineering, production and assembly (31 per cent); and some 61 per cent of firms collectively employ 4,900 apprentices and trainees in production and assembly (37 per cent of apprentices), design and engineering (39 per cent of apprentices) and R&D (17 per cent of apprentices) roles. In other words, it is not just the numbers employed but the quality of the employment which is significant to the UK.

Thirdly, the defence industry is an export-intensive sector, with 87 per cent of firms exporting equipment and services that amounted to orders worth £9.8 billion in 2013. Thus, the UK's defence industry makes a significant contribution to the UK's balance of payments.

Fourthly, ADS calculated that the industry's turnover in 2013 was £22.1 billion and that it returned £8.2 billion in gross value added to the UK economy. This suggests that the UK's defence industry delivers a significant return on capital invested. During 2013, the industry's £8.2 billion gross value added accounted for approximately 0.5 per cent of UK GDP.

A similar approach was adopted by Oxford Economics in their 2009 and 2011 reports entitled *The Economic Case for Investing in the UK Defence Industry*.[56] The Oxford Economics studies are significant because they sought to ascertain 'whether increased investment in defence would be beneficial (and more so than investment in other sectors) for the economy in the current economic climate, in terms of its contributions to UK gross domestic product and employment'.[57] The economic impact of a notional increase of £100 million investment in the UK defence industry was compared with the impacts of a similar investment in other UK industrial sectors. The study found that the UK defence industry has a gross output multiplier of 2.3, meaning that a nominal £100 million initial direct investment in the industry would generate £230 million (including the original £100 million investment) in the UK economy. In this, it ranked 12th when measured against a sub-sample of 27 industries. It also showed that for each additional job created in the manufacturing component of the defence industry a further 1.8 jobs are created in the wider economy, giving a headcount multiplier of 2.8 jobs. This ranked 10th in a sample of UK industries analysed, higher than the median

53 ADS, *UK Defence Industry Outlook*, Farnborough, ADS Group Limited, 2014. The ADS report is based on two research strands that assessed the size, shape and priorities for the UK's Aerospace, Defence, Security and Space sectors. The first was a 2014 ADS/GfK NOP web-based survey of 900 ADS members. The second was an ADS-commissioned survey conducted by the Centre for Economic & Business Research (CEBR), which assessed the turnover, employment and gross value added levels of each of ADS's four sectors. The CEBR study drew on data from the Office for National Statistics, the MoD, the ADS Group and the ADS/GfK NOP Survey.

54 See the Forewords and content of the Defence Growth Partnership, *Implementing the Strategic Vision for the UK Defence Sector*, London, Defence Growth Partnership, July 2014, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/329781/bis-14-953-defence-growth-partnership-delivering-growth-implementing-the-strategic-vision-for-the-uk-defence-sector.pdf (accessed 27 March 2015).

55 These calculations are based on a direct employment multiplier of 1.70 (ie 1 full-time equivalent (FTE) job in defence generated 0.7 indirect FTE jobs), and an induced employment multiplier of 1.59 (ie 1 FTE in defence generated 0.59 induced FTE job in addition to direct and indirect jobs).

56 Oxford Economics, *The Economic Case for Investing in the UK Defence Industry*, Oxford, Oxford Economics, August 2009; and, Oxford Economics, *The Economic Case for Investing in the UK Defence Industry: A Report for ADS and the Defence Industries Council*, Oxford, Oxford Economics, April 2011. Both reports were commissioned by the Defence Industries Council and ADS.

57 Oxford Economics, *The Economic Case for Investing in the UK Defence Industry, A Report for ADS and the Defence Industries Council,* 2011, p. 4. Italics added.

multiplier of 2.6. Both these statistics suggest that the UK's defence industry should therefore be a priority area for investment due to the overall return.

Taken together, the best available evidence suggests that the onshore defence industry provides a range of economic and employment benefits to the UK economy. It is well situated relative to other manufacturing sectors to contribute towards national economic growth and recovery. These findings indicate that decisions taken in future reviews should be informed by an evidence base from which the government can identify the full macroeconomic implications of any increases in expenditure within the UK defence industry.

Correspondingly, this evidence base should quantify the wider economic implications of procuring imported off-the-shelf systems in favour of onshore alternatives. Assessments of the economic value of the onshore defence industrial base should include an analysis of the human resources implications if the sector were to be further run down. Of particular importance is whether qualified scientists and engineers would find equally productive, tax-generating jobs elsewhere in the wider UK economy.[58]

Additional considerations include the relative tax revenue implications of the MoD placing contracts with the UK defence industry or importing defence equipment off-the-shelf from foreign suppliers. The general point is made by Trevor Taylor and John Louth in their paper entitled *The Destination of the Defence Pound* which argues that:

> When a government spends money with a defence contractor, some element of that money is paid to one government or other in the form of taxes. If the UK government spends money on a UK contractor with a largely British supply chain, the great majority of that tax paid will flow back to the British government, whereas money spent with an overseas supplier does not. Instead, it becomes a source of tax revenue for another government.[59]

Using a simplified financial model to trace the destination of the 'defence pound' invested by the MoD in a company registered and operating in the UK during a year-long procurement assessment phase, they found that approximately 36 per cent of the government investment was returned to the Exchequer via tax and National Insurance. This simplified model suggests that if the MoD were presented with a foreign and domestic alternative procurement option of equal performance it would make financial sense 'on tax grounds alone to select a UK-sources solution, even if it were priced up to a third more expensive than the external offering'.[60]

Based on this, they provide broad estimates for tax revenues arising from the MoD's overall equipment programme in 2010/11 and conclude that:

> The UK capital spend in 2010-11 was approximately £9.3 billion. If it is assumed that 20 per cent of that is already spent on foreign systems, it would leave £7.4 billion on UK and collaborative projects. If it is then assumed that 20 per cent of that balance should be deducted to cover the foreign content of the British systems, the balance would be just under £6 billion. Scaling up our approach, the tax revenues associated with this would be in the region of £2 billion.[61]

The evidence provided in this study strongly suggests that the MoD's current 'open procurement' regime – which excludes wider employment, industrial or economic factors in its value-for-money assessments – risks ignoring the potentially significant fiscal benefits of domestic sourcing. The House of Commons Defence Select Committee has identified similar concerns, reflected in its recent recommendation that 'defence equipment and support should be directed to take account of tax revenues when conducting investment appraisals and this should form part of a rounded government decision-making

58 Empirical research on this point indicates that 'when a defence business makes headcount reductions, defence skills and competencies are not redistributed between similar businesses by the free market'. See J. Louth, T. Taylor and H. Heidenkamp, 'Defence Skills: A Shift in the Myth', *RUSI Briefing Paper*, June 2014, p. 13.

59 T. Taylor and J. Louth, 'The Destination of the Defence Pound, *RUSI Briefing Paper*, January 2012, p. 3.
60 *Ibid*., p. 8.
61 *Ibid.*, p. 10.

process'.[62]

The government rejected this recommendation on the grounds that 'the interdependencies in a large, open economy like that of the UK are far too complex for our best interests to be served by such a narrow focus' and because 'there is the possibility that such direction could be open to legal challenge on the grounds of discrimination by EU or other foreign-registered suppliers'.[63] Equally, it could be inferred that if the tax argument were to be adopted by other states it could prevent UK firms from obtaining export orders. There are related concerns that the inclusion of fiscal considerations in MoD investment appraisals could encourage inefficiencies in UK-based companies seeking to compete for procurement orders on the basis of indirect tax benefits rather than equipment quality or price.

Nevertheless, legitimate public policy questions remain about whether the UK's allies and defence trading partners include domestic defence-industrial employment and tax revenue considerations in their own procurement decision-making processes. Moreover to what extent should the British public be made aware of domestic employment and tax implications when major MoD defence equipment requirements are met through off-the-shelf imports? Our analysis of the economic dimension thus far suggests that any future review must comply fully with the UK's obligations under EU law.[64] This precludes anti-competitive procurement practices, as well as acknowledging and identifying the macroeconomic and fiscal significance of MoD procurement choices.

62 House of Commons Defence Select Committee, *Defence Acquisition: Seventh Report of Session 2012-13*, HC 9, February 2013, Para. 70, http://www.publications.parliament.uk/pa/cm201213/cmselect/cmdfence/9/9.pdf (accessed 28 March 2015).

63 House of Commons Defence Select Committee, *Defence Acquisition: Government Response to the Committee's Seventh Report of Session 2012-13*, HC 73, May 2013, Para. 10, http://www.publications.parliament.uk/pa/cm201314/cmselect/cmdfence/73/73.pdf (accessed 28 March 2015).

64 See Ministry of Defence, *The EU Defence and Security Public Contracts Regulations (DSPCR) 2011,* August 2013, https://www.gov.uk/government/publications/the-european-union-defence-and-security-public-contracts-regulations-dspcr-2011. (accessed 10 April 2015).

The evidence leads us to infer that there are not only considerable macroeconomic benefits of procurement through the UK's defence industrial base but microeconomic benefits as well. Another Oxford Economics report, entitled *The Economic Contribution of BAE Systems to the United Kingdom in 2012* examines the contributions of the MoD's major prime contractor.[65] It demonstrates that in 2012, the company had approximately 33,000 employees in the UK, of whom 70 per cent were in highly skilled engineering and manufacturing roles, and that in total, BAE Systems' activities supported 114,920 jobs across the UK.[66] The company spent approximately £3.6 billion on the procurement of equipment, components, raw materials, energy and services from its supply chain of 9,000 suppliers in the UK. The direct value of activities conducted by BAE Systems in the UK included an £8.2 billion turnover, a 'direct value added' contribution to UK GDP of £3.5 billion and export orders amounting to £3.4 billion. The company's direct turnover of £8.2 billion was estimated to have generated a total turnover of £16.9 billion across the wider UK economy (including BAE Systems' own turnover). BAE Systems' 'direct value added' contribution of £3.5 billion created a 'gross value added' contribution (to UK GDP) of £7.8 billion across the economy as a whole (including BAE Systems' own turnover).

We found no evidence of any other systematic economic analyses of major UK defence firms or the domestic industrial and technological supply chains that support prime contractors or the MoD directly. Examples of data gaps include the extent of national economic and technological gains arising from interactions between the Defence Science and Technology

65 Oxford Economics, *The Economic Contribution of BAE Systems to the United Kingdom in 2012: A Report for BAE Systems*, Oxford, Oxford Economics, November 2013. The report was commissioned by BAE Systems.

66 BAE Systems operates globally in the aerospace, defence and security sectors and approximately 42 per cent of its global employees are based in the UK.

Laboratory (Dstl), industry and UK academia;[67] the value created by MoD initiatives to increase the number of SMEs in its supply chain;[68] or the implications of the Defence Growth Partnership (DGP) initiative which seeks to identify and build the 'UK defence value chain'.[69] A further recommendation is that that any future review should take account of the aggregate economic value provided by the UK supply chains that support the activities of the MoD and its prime contractors, informed by new data derived from the DGP's ongoing work.

The UK defence and security industries are producing leading-edge technology, notably in cyber security which plays a significant role in national defence and wider economic security (see Box B). We suggest that further research establishing the extent of the onshore 'body of knowledge' in other defence and security sectors is an essential precursor to any future review.[70]

67 See, for example, HM Government, 'How to work with or sell to Dstl: industry, academia and other research organizations', 1 July 2014, https://www.gov.uk/how-to-sell-to-dstl-industry-academia-and-other-research-organisations (accessed 24 March 2015); Engineering and Physical Sciences Research Council, 'Who we're working with' http://www.epsrc.ac.uk/about/partner/workwith/ (accessed 24 March 2015); House of Commons Select Defence Committee, 'Written Evidence from the Research Councils UK', 24 February 2012, http://www.publications.parliament.uk/pa/cm201213/cmselect/cmdfence/106/106vw08.htm (accessed 24 March 2015); Campaign Against the Arms Trade, 'Top UK universities accept millions in arms company funding', 23 August 2012, https://www.caat.org.uk/media/press-releases/2012-08-23 (accessed 24 March 2015).

68 See Ministry of Defence, 'Defence Contracts Online: Opportunities for SMEs', http://www.contracts.mod.uk/competition-policy/, (accessed 24 March 2015).

69 Defence Growth Partnership, *Delivering Growth: Implementing the Strategic Vision for the UK Defence Sector,* July 2014, p. 6 and p. 25.

70 See Royal Aeronautical Society, 'The Future of UK Defence Aerospace', *Discussion Paper by the Royal Aeronautical Society*, November 2012, pp. 5-8. http://aerosociety.com/Assets/Docs/Publications/DiscussionPapers/FutureUKDefenceAerospaceDiscussionPaper.pdf (accessed 24 March 2015).

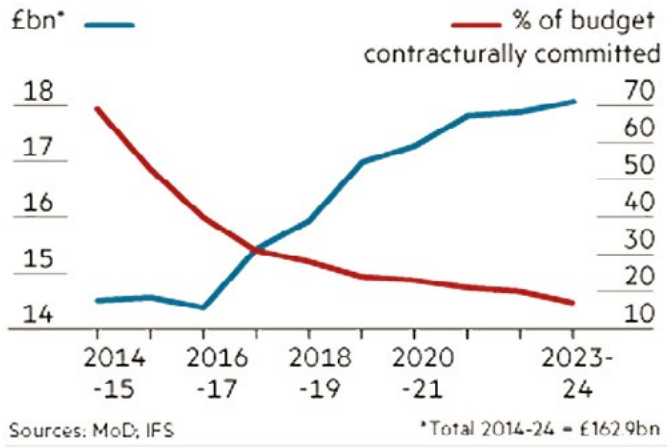
Box B: The UK's strength in cyber security

The UK's strength in cyber security 'stems from hosting some of the best defence and security innovators in the world in both the public and private sectors, such as the internationally recognised Government Communications Headquarters (GCHQ)'. The UK's leading role in this sector is derived from its possession of particular capability strengths including:

- Network surveillance and analysis capacity within industry together with products and services including several advanced security operations centres
- Advisory and assurance services (including secure systems architectures) and world-class schemes for accreditation of products, services and people
- World-class providers of high-end encryption technologies
- A strong technology industry that has an established track record for creating innovative security solutions
- Excellence in education and research, including long-term research undertaken in the UK's eight designated University Cyber Centres of Excellence, namely, the University of Bristol, Imperial College London, Lancaster University, University of Oxford, Queen's University Belfast, Royal Holloway University of London, University of Southampton and University College London

Nonetheless, there are still big decisions to make. In January 2015 the MoD published *The Defence Equipment Plan 2014*, which sets out government plans to spend approximately £163 billion on new equipment and equipment support over the next ten years.[71] It identifies the proportion of expenditure on major projects where the MoD is already contractually committed (Figure 3). The UK defence industry has already been successful in securing involvement in a range of major projects including the Astute Class Submarine (BAE Systems) and Typhoon (BAE Systems, EADS, Finmeccanica). However, a significant proportion of planned expenditure remains contractually uncommitted and key procurement decisions will be taken over the coming years. Existing studies suggest that the award of future major equipment and equipment support contracts should be informed by robust evaluations of wider national economic and employment impacts of domestic sourcing and imported off-the-shelf alternatives.

Figure 3: Equipment budget[72]



71 Ministry of Defence, *The Defence Equipment Plan 2014*.
72 Financial Times, 'UK Defence Sector in Peril of Losing Teeth', 3 March 2015: http://www.ft.com/cms/s/0/65f700c2-c0f-11e4-9949-00144feab7de.html (accessed 25 March 2015).

The available evidence concerning the macroeconomic and microeconomic implications of MoD procurement decisions is extremely limited. This reflects, in part, the implications of the MoD's definition of value-for-money which takes no account of wider employment, industrial or economic factors in its assessments. This sits in stark contrast to its French and US equivalents 'where for major projects a cross-Departmental approach focused on cost and value to the nation as a whole' and where there are mechanisms 'to measure the cross-government impact of contracts going overseas'.[73] It is also at variance with the approach adopted by the European Defence Agency (EDA), which recently commissioned a study with the aim of providing 'a robust quantitative analysis on the European defence industry's impact on Europe's economy'.[74]

The EDA study found that at the EU level 'the impacts on GDP, tax and employment of investing €100 million in the health, education, transport and defence sectors are extremely similar'.[75] It calculated that the impacts from each €100 million cut from EU defence industrial expenditure entails a €150 million fall in EU GDP, a €40 million fall in EU tax revenues in addition to 2,870 jobs lost of which 760 are skilled. This suggests that the impact of increases or cuts in expenditure with the UK defence industry should be a matter of public interest and steps should be taken to identify these impacts as part of an informed and future evidence-based defence review.

There is sufficient evidence to suggest that whether the MoD procures products and services sourced from the UK defence industry or through direct imports has consequences in terms of domestic employment levels, high-technology skills and financial contributions. The evidence further suggests that the scale and scope of the indirect gains to the UK economy when defence capability is sourced domestically are significant enough to raise legitimate public interest concerns about

73 House of Commons Defence Select Committee, *Defence Acquisition: Seventh Report of Session 2012-13*, Para. 33.
74 European Defence Agency, 'Fact Sheet: The Economic Case for Investing in Europe's Defence Industry', January 2015, http://www.eda.europa.eu/docs/default-source/eda-factsheets/2015-01-20-factsheet_economic-case_high (accessed 24 March 2015).
75 *Ibid.*

wider economic impacts when contracts are placed with overseas suppliers. In light of this, it is our recommendation that government research should be commissioned to ensure that policymakers and the public are made aware of the full economic consequences of ongoing MoD procurement decisions as implementation of the *2014 Equipment Plan* progresses.[76]

76 This could be conducted under the auspices of the MoD's current requirement to report annually on the coalition government's Defence Priority 6, relating to the Ministry's requirement to 'promote UK growth'. See Ministry of Defence, *MoD Mid-Year Report to Parliament: April to September 2013*, p. 7 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/275127/20140123_mod_midyear_report_Parliament.pdf (accessed 25 March 2015).

5 | The strategic and economic value of defence exports

5 | The strategic and economic value of defence exports

Since 2012, the coalition government has sought to increase exports, with an emphasis on defence exports in particular. In 2011, it launched *The Plan for Growth*, a major budget deficit reduction initiative that advocated for an 'export-led' national economic recovery by doubling overall British exports to £1 trillion by 2020.[77] Increases in defence exports were specifically identified as a 'vital element' of the 'wider agenda for export-led growth'.[78] Indeed, former Minister for Defence Equipment, Support and Technology Peter Luff stated in 2010 that there would be 'a very, very, very heavy ministerial commitment to the [export] process. There's a sense that in the past we were rather embarrassed about exporting defence products. There's no such embarrassment in this government'.[79]

The government's commitment to defence exports was equally evident in the 2010 *Equipment, Support and Technology for UK Defence and Security* Command Paper:

> The government believes that our defence and security industry already has many positive attributes. It represents a significant proportion of the UK's advanced manufacturing base, enjoys a strong global market share and is a world leader in research and technology development... We must not be complacent, however. The UK has a comparative advantage, but the export potential is not being maximised. With further encouragement, companies – large and small – could benefit significantly more by increasing their exports.[80]

The interest in defence exports is based in part on achieving security and defence ambitions and in part on the economic value they provide.[81] In terms of security, the MoD's *Business Plan for 2011-2015*, for example, draws a direct link between increases in defence sales and the government's ability 'to strengthen British influence and help support [domestic] industry and jobs'.[82] Related policy initiatives have emphasised the 'critical' role of defence exports in developing security relationships with key allies under the government's more politically prominent *International Defence Engagement Strategy*.[83]

The idea that defence exports can be used as levers of power has long been a pre-occupation of UK governments.[84] Despite this preoccupation, we were unable to identify any official studies that quantify the net security gains from export-led security relationships. Nonetheless, evidence was available in the 'grey' and academic literature suggesting that defence exports do provide the UK with leverage and influence over other states which can be deployed to support foreign and security policy goals.[85] The basic point made by Heidenkamp

77 HM Treasury and Department for Business, Innovation and Skills, *The Plan for Growth*, March 2011, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/31584/2011budget_growth.pdf, (accessed 10 February 2015).

78 Ministry of Defence, *Equipment, Support and Technology for UK Defence and Security: A Consultation Paper*, Cm 7989, December 2010, p. 31, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/35916/cm7989_Eqpt_supp_tech_ukdef.pdf, (accessed 10 February 2015).

79 D. Robertson, 'Coalition is not "Embarrassed" to Sell Defence Industry Abroad', *The Times*, 24th June 2010, http://www.thetimes.co.uk/tto/business/industries/engineering/article2571047.ece (accessed 18 March 2015).

80 See Ministry of Defence, *Equipment, Support and Technology for UK Defence and Security: A Consultation Paper,* pp. 30-31.

81 For extended summaries of the historical context, see: M. Pythian, *The Politics of British Arms Sales since 1964*, Manchester, Manchester University Press, 2000, Chapter 1 ; and, A. Dorman, L. Freedman and M. Uttley, 'Pitfalls of the Defence Industry' in *The Report of the Woolf Committee, Business Ethics, Global Companies and the Defence Industry,* Appendix G, 2008, pp. A35-A59.

82 Ministry of Defence, 'MOD Business Plan: 2011 to 2015', https://www.gov.uk/government/publications/business-plan-2011-2015 (accessed 10 February 2015).

83 Ministry of Defence, *International Defence Engagement Strategy*, February 2013, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/73171/defence_engagement_strategy.pdf (accessed 8 April 2015).

84 See, for example, M. Pythian, 'The Politics of the Contemporary Trade in Major Conventional Weapons', in G. Kassimeris and J. Buckley (eds.), *The Ashgate Companion to Modern Warfare*, Farnham, Ashgate, 2010.

85 For a more detailed discussion of these factors, see C. Catrina, *Arms Transfers and Dependence*, New York, Taylor Francis, 1988.

et al. is that defence exports offer an opportunity 'to advance diplomatic and economic relations with the recipient country' that creates 'a long-term high level relationship [...] between the two governments because of the continuous supply of parts, information and sometimes support services that are normally needed'.[86]

In this sense, arms transfers potentially offer three types of benefits to the UK. In the first instance, there is symbolic importance attached to arms transfers which provides an opportunity for the UK to signal its general political commitment to a particular recipient state or government. In the second, arms transfers provide a potential mechanism for the UK to acquire influence and leverage over the policies of recipient states, particularly where there is some form of recipient dependency on the UK. In this scenario, arms transfers provide an opportunity for the UK to employ the (implicit or explicit) threat of curtailing arms transfers if the recipient government fails to accommodate the UK's position. Recent examples of this have included the suspension of existing export licences in response to events in Syria and Egypt during 2013.[87] Finally, arms transfers can increase levels of military capability and self-reliance in friendly states. This capacity-building approach can help to reduce recipient dependence on external security guarantees and can provide the UK with a less costly alternative to direct military involvement in the event of conflict. A self-reliant ally is less likely to turn to the UK in a crisis. It also offers an indirect means to deter aggression against UK allies and a means to enhance regional stability.

It should be acknowledged that UK arms transfers can also have adverse unintended security consequences.[88] One risk is regime change in recipient states: for example, the UK government supplied arms to the Shah of Iran, only

86 H. Heidenkamp, J. Louth and T. Taylor, 'The Defence Industrial Ecosystem: Delivering Security in an Uncertain World', *Whitehall Report 2-11*, London: RUSI, 2011, p. 8.

87 See J. Lunn, *UK Arms Export Control Policy, House of Commons Standard Note SN02729*, 21 November 2014.

88 See P. Ingram and I. Davis, *The Subsidy Trap: British Government Financial Support for Arms Exports and the Defence Industry,* Oxford and London, Oxford Research Group & Saferworld, 2001.

for the Ayatollah to turn against the West after the Iranian Revolution. Another is the potential for the UK to lose control over exported technology, in cases where recipient states retransfer systems to third parties. A further risk is that UK armed forces may face weapons supplied by their own government. As the Scott Report highlighted, after UK companies aided the development of Iraq's military capabilities British forces faced domestically-produced equipment during Operation Desert Storm.[89] These factors suggest the need for official studies that seek to quantify the net security gains derived from export-led security relationships.

In addition to the potential security value of defence exports, evidence suggests that UK arms transfers provide a considerable economic contribution to the nation. Official statistics summarise financial aspects of the current scale and scope of UK defence exports. UK Trade and Investment figures[90] indicate that the UK defence industry has retained a 20 per cent share of the global defence export market over the last decade and currently remains the second highest world defence exporter (based on orders/contracts signed) behind the US. During 2013, the UK defence industry obtained orders worth £9.8 billion from states in the middle east (67 per cent), north America (12 per cent), Europe (12 per cent) and the Asia Pacific region (9 per cent). Between 2004 and 2013, the aerospace sector accounted for 83 per cent of UK defence exports, followed by land systems (10 per cent) and sea systems (7 per cent).

As with the security value defence exports might provide, however, we found no evidence of government research that has sought to quantify the net economic benefits to the UK

89 See D. Miller, 'The Scott Report and the Future of British Defense Sales', *Defense Analysis*, Vol. 12, No. 3, 1996, pp. 359-369; and, D. Miller, *Export or Die: Britain's Defence Trade with Iraq*, London, Cassell, 1996.

90 UK Trade & Investment Defence and Security Organisation (UKTI DSO), 'UK Defence & Security Export Statistics for 2013', July 2014, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/327679/UKTI_DSO_Export_Statistics_for_2013_-_Slides.pdf (accessed 24 March 2015). These are 'official statistics' compiled by the UKTI DSO and KMatrix, and draw 'on information provided by hundreds of UK Companies to UKTI DSO via a voluntary survey, ... complemented by open source reporting of Defence Export contracts of other countries'.

derived from defence exports, including tax receipts and the contribution that export sales make to producers' fixed overheads that would otherwise be met by the MoD.

One area of ambiguity surrounds whether UK defence firms will be able to compete successfully for export contracts in cases where the equipment in question has not been procured and operated by the MoD. On the one hand, through the DGP, government and industry are currently exploring ways to enhance the export competitiveness of the UK defence industry. On the other, the government has expressed preference for global markets and off-the-shelf procurement to meet the MoD's equipment and equipment support needs. The House of Commons Defence Select Committee, defence industry representatives and independent analysts have all expressed concerns about whether it is realistic for industry to expect to obtain export orders for equipment that the MoD has elected to reject in favour of imported off-the-shelf alternatives.[91] We could find no evidence of cases where the UK industry has failed to obtain export orders on these grounds. This may be because cases have not yet arisen where industry has sought to export products that have not already been purchased by the MoD. Our assessment is that this issue requires further analysis before subsequent government reviews of defence industrial policy because if such impediments do exist then they have a direct bearing on the economic and employment aspects of onshore defence industrial activity.

The UK has therefore achieved security and economic gains through defence exports, reflected in its current status as the world's second highest arms exporter. However, the net national security and economic benefits have not been calculated with precision. Moreover, questions remain over the viability of developing export markets for technologies that are not already in use by the UK's armed services. We recommend that these issues are addressed to inform the next SDSR.

91 See, for example, House of Commons Defence Select Committee, *Oral Evidence: Defence Growth Partnership*, HC 482, Q1, 11 November 2014.

6 | Reflections and recommendations

6 | Reflections and recommendations

This was a challenging piece of research - particularly bearing in mind the absence of key official data and statistics on the UK defence industry.

Nevertheless, our analysis suggests that government decision-making may be suboptimal as a consequence of a dearth of official data and statistics, with potential implications for the nation's overall defence and economic wellbeing and its ability to influence others. This is especially concerning in uncertain and austere times.

However, the best available evidence suggests that the maintenance of onshore defence-industrial capacity provides significant military benefits to UK security and defence because it ensures a secure, assured and agile supply chain. Correspondingly, without a vibrant and thriving domestic defence industrial base to provide this, there is a risk that the UK will jeopardise its freedom to act in an unstable, fast-changing world. Moreover, there is the very real risk that the traditional post-1945 assumption that British forces would have a technological advantage over their potential opponents is at risk and may result in higher UK casualties. We therefore recommend that the government clearly distinguishes between those UK military capabilities where domestically sourced capabilities are necessary to ensure freedom of action and those where reliance on foreign sources is acceptable. We further recommend that the R&D element of defence spending is protected and ideally expanded.

Despite the absence of up-to-date government data, the best available evidence strongly suggests that the UK defence industrial base provides significant economic value to the UK. The MoD's procurement choices between products and services sourced from the UK defence industry or through direct imports have consequences in terms of domestic employment levels, high-technology skills and financial contributions. Our research also suggests that the UK defence industry forms a vital national hub generating science, technology and skills within the national workforce. In the absence of analysis, we therefore recommend that the government conducts or commissions a systematic study that identifies the net economic benefits and costs of onshore defence industrial activity to the UK. We further recommend that such a study should identify the aggregate economic and technological value provided by the UK supply chains that support the activities of the MoD and its prime contractors, and wider contributions to national innovation and the 'knowledge economy'.

Finally, our research suggests that UK defence exports achieve security and defence objectives as well as provide economic value to the UK. The government's *International Defence Engagement Strategy* seeks to maximise the UK's leverage and influence in the international system through defence exports. At the same time, defence exports form a 'vital element' of the government's wider export-led growth agenda. We recommend that future defence industrial policy should be informed by a clear understanding of the *net* security benefits that defence exports provide and the extent to which export potential is dependent upon prior MoD purchases.

In conclusion, our overarching message is that the onshore defence industrial base provides military, national security, economic, technological and strategic value to the UK. Identifying and quantifying where this value lies will be a critical pre-cursor to a considered and evidence-based approach to Britain's forthcoming review of defence and national security strategy.

Authorship, acknowledgements and bibliography

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