

## Building our Industrial Strategy - Green Paper, January 2017

Response by: The Centre for Economic Performance, London School of Economics

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### **Question 1: Does this document identify the right areas of focus: extending our strengths; closing the gaps; and making the UK one of the most competitive places to start or grow a business?**

We broadly agree with the three areas of focus. It is worth emphasising however that building on our strengths and extending our excellence in the future should include efforts to build strengths in areas that are crucial for future sustainable growth and the wellbeing of our population, such as the technologies and skills that can help us to achieve a low-carbon economy and improve health and social care. This ties into the discussion of a "mission" focused industrial strategy, discussed further in our answer to Question 2.

In addition, while it is important to build on our strengths in scientific and technological research, we must also recognise the importance of other disciplines. The UK is primarily a service economy and some of the most innovative industries with the highest rates of productivity growth are in the service sector. Academic disciplines are complementary and interwoven and R&D across the whole spectrum of intellectual disciplines should be supported. The UK has a strong tradition in arts and humanities and the social sciences, with around a quarter of the world's top 20 universities in those disciplines.<sup>1</sup> As economists, we note that social science research is particularly important for the development of effective policies, a point which is especially relevant as policymakers seek to develop the new industrial strategy. In a resource constrained environment it is all the more important that policy should be evidence-based, which means that efforts must be made to improve and create datasets, design policy experiments where possible, and conduct analysis to evaluate policies. All of this is only possible if the social sciences continue to receive sufficient research funding.

### **Question 2: Are the 10 pillars suggested the right ones to tackle low productivity and unbalanced growth? If not, which areas are missing?**

We consider that all 10 pillars are important elements in tackling low productivity and unbalanced growth. We would add the following points.

First, despite recent additional resource committed by the government into the science budget, the UK continues to invest substantially less in R&D as a share of GDP than other advanced economies. We consider that the UK should aim to increase both public and private R&D to a comparable level. As set out in Question 1, this should be channelled across disciplines and include the social sciences.

Second, upgrading infrastructure should involve a nationally coordinated plan to create "smart cities", and reduce air pollution. The types of measures that are likely to be valuable are low emission zones, diesel scrappage schemes and replacement of public infrastructure (such as buses) with low emissions alternatives.

Third, developing skills should include focus on improving school outcomes for disadvantaged children, who tend to do worse at school. This must involve ensuring that the appropriate pre-school and school resources are provided and there are currently significant risks in this area. While developing skills is crucial, it is also important to consider the misallocation of skills. This is a particular issue with female talent. In today's labour market, women enter the workforce often better educated than their male counterparts. But after having children, women are more likely to drop out of the workforce altogether or switch to part-time work, often at a lower skill level than that which they were working at before having children. Of course, not all mothers wish to return to work, but for those who do, government can help to address obstacles that prevent them from doing so. A

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<sup>1</sup> According to *The Times* World University Rankings for 2016-17, 5 of the top 20 arts and humanities universities; and 5 of the top 21 social sciences universities are in the UK. See <https://www.timeshighereducation.com/news/world-university-rankings-2016-2017-results-by-subject-announced>

good example of the type of policy that is likely to be effective (based on the international evidence) is the establishment of Swedish style “daddy months”.<sup>2</sup>

Fourth, while it is important to cultivate world leading sectors, there is a tension between this approach, with its risks of attempting to “pick winners” and an open and competitive industrial strategy. Transparent and competitive processes should be incorporated to decision making over the establishment and form of sector deals. This requires a real understanding of the nature of market failures, and whether government intervention can be effective in addressing them. A “missions” approach can avoid the need to define sectors, providing support and coordination to all firms/stakeholders working towards solving public policy challenges such as reducing air pollution in our cities, decarbonisation, or improving health and social care. In addition to cultivating world leading sectors, it is important to also address market failures that prevent low-productivity, low-pay sectors from investing in technologies, management practices or skills that would improve their performance. The aggregate productivity gains from raising performance in such sectors can be large, as they represent a large share of employment.

### **Question 3: Are the right central government and local institutions in place to deliver an effective industrial strategy? If not, how should they be reformed? Are the types of measures to strengthen local institutions set out here and below the right ones?**

Current institutional structures are not well-placed to deliver an effective and long term industrial strategy. Lessons can be learned from the frameworks governing UK monetary, fiscal and competition policy. Objectives are defined and enshrined in law. Independent agents play a role in offering advice and in some cases taking policy decisions. The remit of such bodies is transparent, with justifications for their advice presented in statutory publications. This has the potential to create a more stable framework and promotes open government with external scrutiny by think-tanks, journalists and academics. British industrial strategy lacks every element of this general framework. Its focus, existence, and even the name of the department implementing it are subject to the whims of Prime Ministers or Business Secretaries. This creates political uncertainty and hampers long-term decision making. The lack of transparency undermines scrutiny and creates uncertainty for private investors.

Government now has a real opportunity to differentiate this new industrial strategy from other recent government strategies and plans – such as the coalition’s Industrial Strategy or Plan for Growth, and the Conservative government’s Productivity Plan - by reforming the institutional structure that governs it. The LSE Growth Commission recommends that industrial strategy be given:

- **A new law or long-lasting mandate, including a new state aid law.** The existing EU State Aid framework has prevented arbitrary forms of political intervention in the economy. Developing a new legal framework to replace it is essential once the UK leaves the EU. This will help to ensure that the new industrial strategy is competitive and contestable.
- **A set of public guidelines for intervention.** The development of a set of transparent (and preferably quantifiable) rules and guidelines for intervention in particular sectors, technologies or places are required. Competitive processes should be used wherever possible to ensure that government support is channelled to its most beneficial use.
- **Independent decision making or oversight.** The ultimate objective should be a long-term industrial strategy that is isolated from political cycles. There is a menu of options to choose from – like the Bank of England’s Monetary Policy Committee, to Britain’s independent budget, antitrust and infrastructure bodies. Any one of these would be better than the current ad hoc set up.
- **Enhanced transparency and accountability.** The government should therefore publish a long-term plan setting shared objectives and aligning decision-makers across government, industry and other stakeholders.
- **External debate and scrutiny.** The body responsible for industrial strategy should publish a standardised *Industrial Strategy Report* every year on the state of British business. (In line with the OBR’s *Economic and Fiscal Outlook*, or the Bank of England’s *Financial Stability Report*). This would provide regular

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<sup>2</sup> See Bandiera and Valero (2016) for more discussion.

material on the productivity of UK firms, with updates on industry- or location-specific policies, together with their costs and measured impacts.

The government's industrial strategy should be **long-term to provide business and other key stakeholders with a stable policy environment**, and avoid the waste associated with constantly scrapping, re-branding or changing its constituent programmes. A case in point is the "Growth Accelerator" programme introduced by the coalition government in 2012, to help SMEs access coaching and match-funding services. This was scrapped in 2015 with little justification: initial evaluations found that the Growth Accelerator was viewed positively by businesses and other involved parties<sup>3</sup>, and more robust economic evaluations of the programme had been planned.

The suggested institutional framework would also help **coordination between the different government departments and levels of government** who will be responsible for different elements of the industrial strategy. To this end, it is a positive development that the Prime Minister is chairing the Cabinet Committee on the Economy and Industrial Strategy, and that the Secretary of State for Business, Energy and Industrial Strategy sits on more Cabinet Committees than any other Cabinet Minister. The proposed Ministerial Forums on Industrial Strategy within the devolved administrations are also a promising mechanism for coordinating different departments in Whitehall with devolved governments.

As highlighted in the Green Paper, the significant regional imbalances in the UK require a 'place-based' approach. With the trend towards devolution and the agreement of a number of City Deals over the last few years, a number of important policy levers that can help to deliver an effective industrial strategy are now at the level of nations and regions, including skills, innovation and infrastructure. **The devolution agenda and regional initiatives will need to be underpinned by a national strategy to deliver policies that are tailored to each part of the UK's industrial strengths, and the right balance between local initiative and central direction.**

The current structure of local and regional governance is not well-placed to deliver place-based challenges. This explains the long-standing failure to deliver housing as means of supporting regional growth initiatives. Delivery of housing needs to be tied to delivery of infrastructure and to provision of public services, and indeed skills strategies.<sup>4</sup> Moreover, while the LEPs have the potential to help deliver successful local economic growth strategies, there is some disjointedness between local government and LEPs and it is unclear how they fit into the evolving devolution landscape. There are also a number of concerns surrounding the effectiveness of the LEPs, in particular as they appear to lack sufficient resource, and lack incentives to invest in projects for long-term development.<sup>5</sup>

Universities are key actors in policies for places, improving regional economic performance via their role as producers of skills and incubators of innovation.<sup>6</sup> **There is enormous potential when universities work in they partnership with ambitious city and regional leadership and it is important to improve engagement between universities, LEPs and local government.** However government focus should not only be on the "supply" of research from universities, but also on the commercial "demand" for R&D.<sup>7</sup> Government must examine whether more can be done to incentivise businesses to invest in R&D.

#### **Question 4: Are there important lessons we can learn from the industrial policies of other countries which are not reflected in these ten pillars?**

There is no single international "best practice" industrial strategy. The success of a strategy – and associated industrial policy interventions – is a function of each country or region's own strengths and weaknesses, historical and economic context. In the LSE Growth Commission report we set out some key lessons from a number of countries which have successfully developed competitive advantages through the interaction of government and business. In terms of lessons which have not been reflected in the ten pillars, we highlight the following:

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<sup>3</sup> See BIS (2015).

<sup>4</sup> These issues are discussed in detail in the National Infrastructure Commission's report on the Oxford-Milton-Keynes (NIC, 2016).

<sup>5</sup> See NAO (2016)

<sup>6</sup> See for example, Valero and Van Reenen (2016).

<sup>7</sup> House of Commons Science and Technology Committee (2017)

- **Public investment in science and innovation: United States.** This provides an important example of the success of government financed research, which has been the source of some of the most significant post-war innovations. The US experience highlights the importance of efforts to maximise spillovers via promoting information flow and collaboration between universities and the private sector, and of having competitive processes surrounding the allocation of public funding for basic research.
- **A clear and co-ordinated plan: South Korea.** While the type of industrial policy pursued in South Korea was highly interventionist and protectionist and therefore unlikely to be applicable to the UK, we highlight an important feature in its implementation: it involved strong and joined-up institutions, a long-term strategy and government monitoring its success against pre-determined targets.
- **Linking to wider missions: Germany's Energiewende.** In 2010, a new commitment to decarbonised energy supplies was passed into German legislation, this involves a stated target to generate 40-45% of electricity from renewables by 2025, rising to over 80% by 2050. One key beneficiary of this policy has been the German green industry which is now a world leader. Given that this is a sector that can only rise in importance in the future, this dimension provides an example of industrial policy which grows technologies of the future
- **Stimulating industry through public procurement: Public service broadcasting in the UK.** The BBC provides an example of how procurement by a public sector body can both stimulate private sector growth and address regional imbalances. Central to the success have been efforts to ensure a competitive process around commissioning content.

## Investing in science research and innovation

### Question 5: What should be the priority areas for science, research and innovation investment?

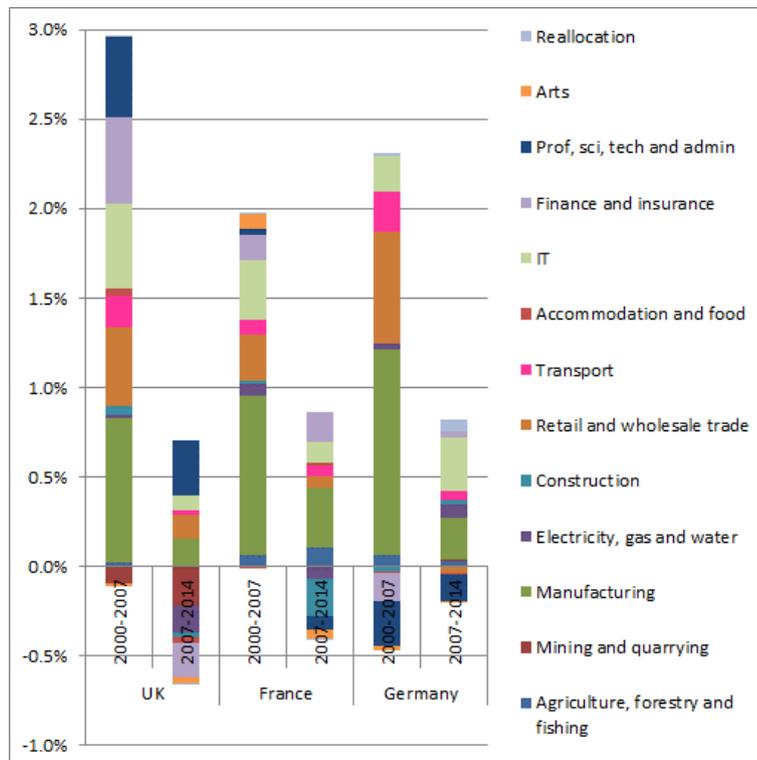
The first priority should be to increase R&D investment as a share of GDP to a level similar to our advanced economy peers. The extra £2 billion annually that was promised to the science budget in the Autumn Statement (from the new National Productivity Investment Fund, NPIF) is welcome, but still leaves R&D as a share of GDP at under 2%.

Research has found that a one-off 5% increase in UK public sector R&D (an increase of £450m) would raise private sector output by about £90m per year in perpetuity<sup>8</sup>, and effects from “leveraging-in” private R&D would be additional to this. Therefore there is a strong case for increasing the science budget further. We must recognise that the UK is primarily a service economy and some of the most innovative industries with the highest rates of productivity growth are in the service sector. **Figure 1** shows that services have been the main contributors to productivity growth before the financial crisis and that productivity growth in professional, scientific, technical and administrative services has held up relatively well since the crisis- a pattern that differentiates the UK from France and Germany. Disciplines are complementary and interwoven and R&D across the whole spectrum of intellectual disciplines should be supported.

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<sup>8</sup> Haskel et al (2014)

**Figure 1: Decomposition of Labour Productivity Growth (output per hour)**



Source: EU KLEMS

As well as increasing government financed R&D, there is a need to address obstacles preventing businesses from investing in R&D. This links to the discussion of the problems that innovative firms have in accessing finance (see our answer to Question 18, many of the issues preventing investment in fixed capital also apply to investment in R&D). We welcome the Green Paper’s announced review of the tax environment for R&D. CEP research has found a causal relationship between R&D tax credits and innovation, with the large effects found in small firms which tend to face higher financing constraints.<sup>9</sup>

The Green Paper correctly identifies the need to ensure that the UK continues to attract top international talent. It is essential that leading universities are able to recruit international talent (as faculty, research staff and students). High quality students and researchers from abroad can not only contribute to the economy directly, but international students also increase resources available for domestic students.<sup>10</sup> The visa system for non-EU nationals was already considered too restrictive before the Brexit vote, and there are now new concerns around the status of EU students and academics. Parliament has established a Select Committee to examine the impact of Brexit on the university sector and evidence presented so far suggests that applications (from both EU and non-EU students) have fallen since the EU referendum, and that academics now consider the UK a less attractive place to work and conduct their research. There are also new risks to the HE sector with respect to cross-border collaboration in research projects and their funding, a large portion of which has come from the EU. It is essential that the UK maintains its commitment to international academic and entrepreneurial talent, and cross-border research programmes.

**Question 6: Which challenge areas should the Industrial Challenge Strategy Fund focus on to drive maximum economic impact?**

We welcome the establishment of the “Industrial Strategy Challenge Fund”, and the criteria for challenges of focus. We add the following point, which we also make in our answer to Question 5: it is important to recognise that the UK is primarily a service economy and some of the most innovative industries with the highest rates of productivity growth and strongest comparative advantage are in the service sector. Disciplines are complementary and interwoven, including the social sciences and “cultural and creative” sectors. Therefore,

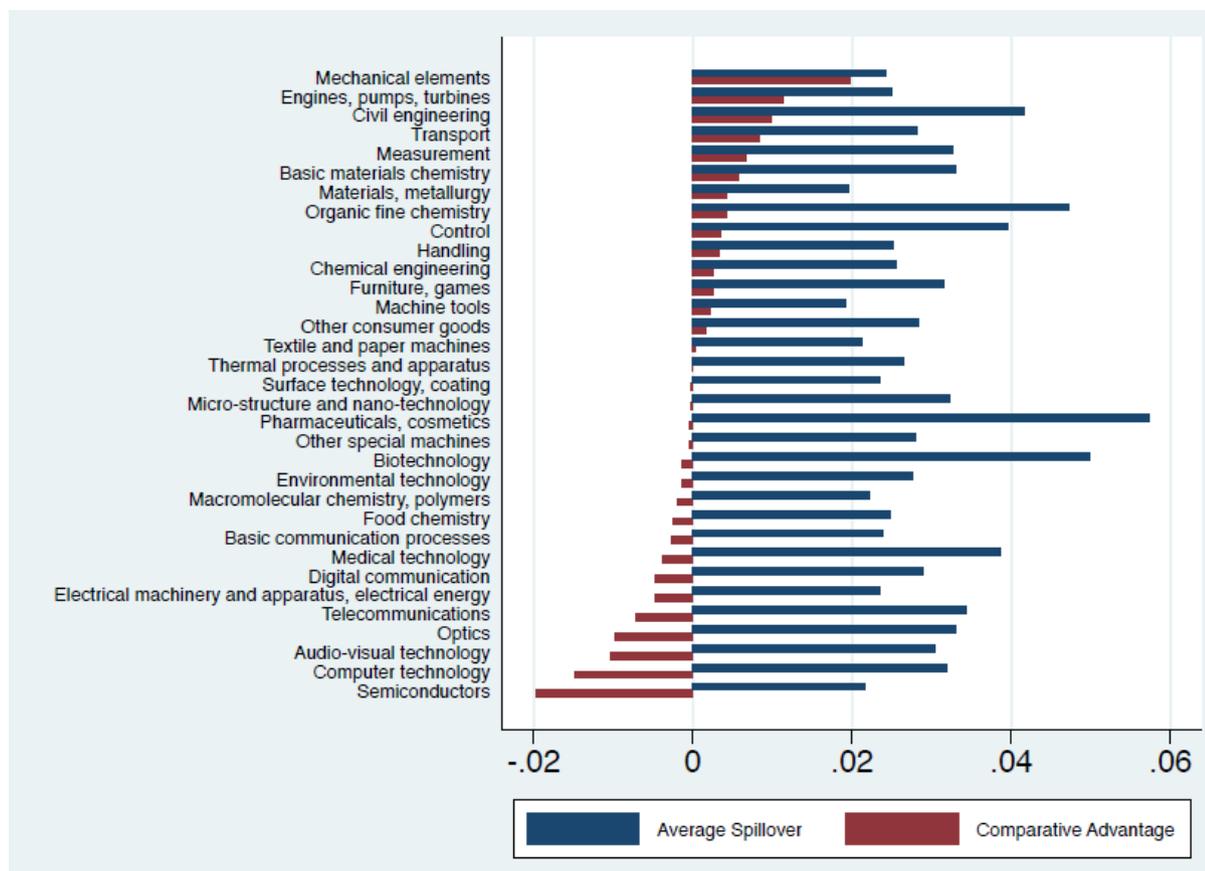
<sup>9</sup> Dechezleprêtre et al. (2016).

<sup>10</sup> Machin and Murphy (2014).

R&D across the whole spectrum of intellectual disciplines should be supported rather than focusing on STEM areas alone.

When considering potential economic impact, government should focus its attention on areas where market failures are most likely hampering the most efficient allocation of resources. This might not necessarily be those areas where comparative advantage is already established. This can be illustrated using analysis of knowledge spillovers. **Figure 2** compares the knowledge spillovers generated within the UK for a given technology field with the UK's comparative advantage in that field (in terms of patenting). It shows that the UK seems to have a fairly high comparative advantage in fields such as mechanical elements, engines, civil engineering and transport, however areas where UK knowledge spillovers are highest seem to be pharmaceuticals and bio-technology.

**Figure 2: Knowledge externalities and comparative advantage by technology area**



Source: Calculations based on global patent data (1950-2005). Comparative advantage is based on the relative innovation share of the UK in area X compared to the 10 most innovative countries globally. Average spillover is an estimate of the average knowledge spillover a patent in area X generates within the UK. For this we measure innovation spillovers using patent citation data and we employ a modification of Google's Page Rank algorithm to take into account both direct and indirect spillovers (i.e. innovation C being influenced by innovation A via innovation B, etc). For further details see Dechezleprêtre et al (2017).

**Question 7: What else can the UK do to create an environment that supports the commercialisation of ideas?**

Government focus to date has been predominately on the supply side of research (universities) – but a number of reviews in recent years have notes that addressing the demand side – from businesses - is crucial to improve the commercialisation of ideas in the UK. :

- **Improving access to finance for innovative firms.** For more discussion on measures to improve financing options for firms seeking early stage funding see our answer to Question 18. Increasing the availability of equity finance is part of the solution. The government's patient capital review should consider what lessons can be learned from patient capital funds already developed by some universities.<sup>11</sup>

<sup>11</sup> See discussion in House of Commons Science and Technology Committee (2017).

- **Tax incentives.** R&D tax credits have been shown to be effective at stimulating R&D and patents, especially for smaller firms.<sup>12</sup> There might be scope for providing explicit support for business-university research collaboration within the R&D tax credit system.
- **Catapult centres.** Government should build on the existing Catapult network, which provides people and resources for translating science into innovation and has so far been considered successful (Hauser, 2014). Catapults can help universities to build relationships with SMEs through their role as a hub.
- **Creating stronger links between universities and their local areas.** While LEPs have a remit to support local innovation, the relationship between LEPs and universities is not clearly defined. Moreover, a scheme of “University Enterprise Zones” (UEZ) is currently being piloted, with the explicit aim to increase collaboration between universities and businesses, but this was not mentioned in the Green Paper. The obligations of LEPs in this area, and the future of UEZs should be clarified.

### Question 8: How can we best support the next generation of research leaders and entrepreneurs?

As previously discussed, increasing resources via the Science Budget, supporting a range of disciplines and ensuring that the UK continues to access the top international talent (current and future researchers and entrepreneurs) are crucial. It is worth emphasising that the graduates from our top universities might go on to be top researchers and entrepreneurs and the UK should ensure that it remains open to international students

Some focus on entrepreneurial training, “soft” skills and encouraging resilience in schools and beyond can also help boost the next generation of entrepreneurs. In addition to technical skills, “soft” skills are also important for productivity and labour market success (see for example, Heckman et al, 2006). As frequently highlighted by the CBI, many employers report gaps in soft or professional skills. We already have relatively widespread provision of this type of training in the UK: Young Enterprise<sup>13</sup> is a charitable organisation that trains young people in personal, entrepreneurship and general business skills that works with around half of our secondary schools, and many primary schools and universities. Surveys of alumni from these programmes suggest a number of benefits – including confidence, clearer career intentions, higher resilience and better entrepreneurship outcomes - more robust evaluation of these types of programme would be valuable. In schools, embedding some form of enterprise education in the curriculum and assessment would ensure that all young people are able to develop these types of skills. Similarly, certain further and higher education courses could include enterprise modules.

### Question 9: How can we best support research and innovation strengths in local areas?

Improving local infrastructure, skills and entrepreneurial conditions (including access to finance) are important avenues for improving research and innovation activity in local areas – as these types of measures increase the attractiveness of a local area to researchers and innovative firms. This is connected to the development of “smart cities”, cities that are connected, compact, attractive and liveable in. We discuss this more in our answer to Question 35.

Evidence reviewed by the “what works centre for local economic growth” urges caution on the role that regional innovation policy (such as grants, subsidies or tax credits at local levels). In part this is because of the spillovers associated with R&D activity. Moreover, local R&D support programmes can result in inefficiently high levels of support if footloose firms are able to extract more generous support from competing local areas regardless of any net beneficial impact.

At a local level it is important to strengthen relationships between LEPs and universities. While LEPs have a remit to support local innovation, the relationship between LEPs and universities is not clearly defined.<sup>14</sup> Moreover, a scheme of “University Enterprise Zones” is currently being piloted, with the explicit aim to increase collaboration between universities and businesses, but this was not mentioned in the Green Paper.

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<sup>12</sup> Dechezleprêtre et al. (2016).

<sup>13</sup> <https://www.young-enterprise.org.uk/>

<sup>14</sup> Dowling (2015) and House of Commons Science and Technology Committee (2017)

## Developing skills

### Questions 10-13:

Note to Industrial Strategy team: *Skills are a major part of the recent Growth Commission report, as well as the CEP's first Growth Commission. This material is all collected on the Growth Commission publications page<sup>15</sup>. We note that the LSE's Centre for Vocational Education Research (CVER) have rich expertise in this area and have responded separately. The CEP team has seen this response and supports the ideas and advice our colleagues have set out.*

### **Technical education**

The inadequacies in the UK's technical education system are well-known. The quality of vocational qualifications needs to be improved so that they represent a real alternative to university for school leavers, and add value for employers. There are still numerous vocational qualifications on offer, and the potential routes to be followed post-16 are much less well known than A-levels. Qualifications are awarded by many different bodies, and the quality of expected outcomes following vocational options is often unclear to school leavers, teachers and employers. The Green Paper builds on existing government policy in this area, rather than proposing any dramatic new policies. The 2015 "Productivity Plan" set out policies to raise the prestige of vocational qualifications, and the 2016 "Post-16 Skills Plan" includes wide-ranging reforms that would simplify and improve the post-16 system of vocational training, for example through the creation of a small number of full-time technical routes with a single awarding body. While these plans are promising, we are concerned about whether government has committed sufficient resource. In addition, proposals lack detail in some areas, for example how to promote lifelong learning. In order to help overcome financial barriers to retraining or upskilling, the LSE Growth Commission proposed a system of training tax credits to incentivise companies to invest in training their workforce.

### **Improving the outcomes of pupils from disadvantaged backgrounds**

A key issue, as identified in the Green Paper, is the need to improve the outcomes of pupils from disadvantaged backgrounds. We consider that there are a number of risks in this area.

- **Schools funding:** The schools funding formula has long been in need for reform, as it was based on a historical "spend-plus" methodology which did not adequately reflect local costs, especially in deprived areas. Government has recently announced proposals to reform the schools funding formula, so that historically lower-funded local authorities increase their allocations. But this will be at the expense of schools in London and other urban areas that have historically received higher funds, and importantly will be set against a background of real-terms cuts in school spending estimated at 8% per pupil by 2019-20.<sup>16</sup> This will be the first time since the mid-1990s that school spending has fallen, and the real-terms cut is the largest since the 1970s. These budgetary pressures risk harming educational outcomes, at a time when there are already concerns about the UK's performance compared to other countries'. Budget 2017 announced new funds for selective schools, including grammar schools. Those in favour of such policies argue that grammar schools improve the opportunities for poorer children. However children from disadvantaged backgrounds are under-represented in grammar schools and evidence suggests that education in non-selective schools is likely to suffer as the number of selective schools rises.<sup>17</sup>
- **Schools reorganisation:** In a resource constrained environment it is especially important to understand what works in terms of improving outcomes. A good example is the availability to researchers of data sources like the National Pupil Database which enables robust policy evaluation, a pre-requisite for the effective design of evidence-based policy. Research to date supports the academisation of poorly performing secondary schools, but finds little effect in the later wave of primary school academies.<sup>18</sup> We suggest that resource should be focused on improving educational provision in existing schools, rather than costly reorganisations where there is little evidence of effectiveness.

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<sup>15</sup> <http://www.lse.ac.uk/researchAndExpertise/units/growthCommission/documents/home.aspx>

<sup>16</sup> IFS (2016)

<sup>17</sup> Atkinson et al. (2006).

<sup>18</sup> See Eyles and Machin (2015) and Eyles, Machin and McNally (2016).

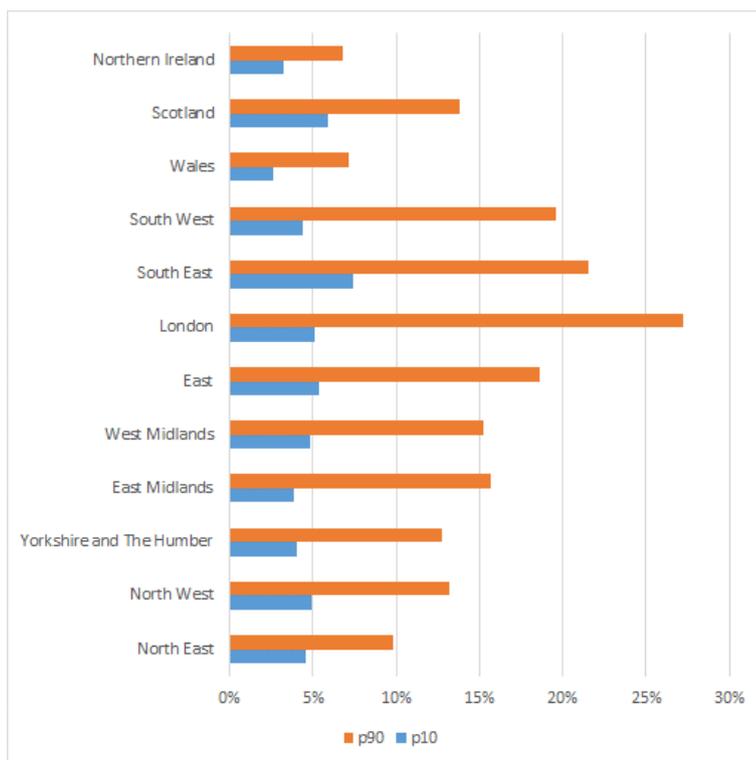
- **University funding:** Continued increases in the total costs of university education are likely to create a tension with opening up access to poorer families. Evidence suggests that the conversion of maintenance grants to loans (since September 2016) is likely to hurt applications from poorer students.<sup>19</sup>

### ***The misallocation of female talent***

We believe a first order issue when considering how to improve the productivity of the UK workforce is to address the misallocation of female talent. Gender gaps in participation and wages are high compared to other OECD countries. These patterns are not driven by innate gender differences in talent or preferences: when they enter the labour market, women in the UK have similar occupational patterns and pay as their male counterparts. Rather gaps are largely explained by career breaks and part-time work after women have children (which is often at a lower skill level than that which they are qualified for).

But there are gaps even when we compare the hourly wages of full-time women and men. **Figure 3** shows that the gender gap in wages at the top end (90<sup>th</sup> percentile) is much larger than at the lower end (10<sup>th</sup> percentile) of the distribution, reflecting the fact that gender gaps are wider at higher education levels and later in the life-cycle.<sup>20</sup> A key concern from a productivity perspective is that the skills of highly educated and experienced women are not being put to use in the labour market.

**Figure 3: Gender gaps in hourly wages**



Notes: The chart compares full time hourly pay excluding overtime between women and men at the 90<sup>th</sup> and 10<sup>th</sup> percentile of each region respectively. Source: NOMIS (ONS)

Other countries have introduced policies (for example, Sweden’s “daddy months”) that encourage parents to share work and home responsibilities. In addition, there is more scope to improve the availability of childcare, promote flexible working and support lifelong learning to support women who wish to return to work after career breaks. Studies suggest large productivity gains would be possible from tackling skill misallocation, and point to wider societal gains from policies that encourage parents to share home and work responsibilities.<sup>21</sup>

**Question 14: How can we enable and encourage people to retrain and upskill throughout their working lives, particularly in places where industries are changing or declining? Are there particular sectors where this could be appropriate?**

<sup>19</sup> See Dearden et al. (2014) and Dynarski (2003).

<sup>20</sup> See Costa Dias et al. (2016).

<sup>21</sup> See Bandiera and Valero (2016).

Continuous skill development can help workers gain greater security and adaptability in a world of rapidly changing technologies and labour market structures. In order to achieve this, it is important not only to improve the education and training system, but also the ability of individuals and firms to finance this. In the 2015 Productivity Plan, government announced new loans for postgraduate and MBA study which is likely to help in this regard. And the Green Paper states that government will consider introducing maintenance loans for higher technical education.

The LSE Growth Commission proposes a new system of tax breaks for skills investment. In particular, it proposes that tax breaks and allowances for capital should be extended to skills, in order to place investment in staff training, courses and education on the same footing as investment in plant and machinery. Support could take the form of a Skills and Training tax credit which is similar in spirit to the existing R&D tax credit. The policy would need to be carefully designed to ensure additionality and that money was spent on high quality skills provision that adds to employability, career progression prospects, and to worker productivity. Such a skills development and training strategy requires close interaction between employers and well-resourced technical/adult education colleges, taking into account local demand and industrial structure.

The need to retrain and upskill can be particularly relevant for women who wish to return to work after having children. Women who have been out of the workplace may need to update their skills in their previous line of work (this is particularly the case given the fast pace of technological progress). While some firms recognise the potential in highly skilled women in this category and pay for the training, it could be beneficial to go on a course before the job search. Some may wish to retrain in a different area before re-entering the workforce. Future-income contingent, low interest loans would help women undergo this type of training. Government could also offer extra support in areas where there are known shortages of high quality professionals such as nurses or teachers.

## Upgrading infrastructure

As part of producing its National Infrastructure Assessment, the National Infrastructure Commission has issued a detailed call for evidence, seeking views from stakeholders on a range of questions about UK infrastructure policy. The National Infrastructure Commission's call for evidence is open until 10 February 2017. The questions below seek to complement this work.

### **Question 15: Are there further actions we could take to support private investment in infrastructure?**

Infrastructure finance is a longstanding problem in the UK. The first LSE Growth Commission report discussed this issue in detail. Infrastructure projects are by their nature long term, with uncertain payoffs and hence investors require a high cost of capital. Policy uncertainty and short-termism in the UK has increased the risk and the cost of capital further.

The newly established and independent National Infrastructure Commission should help mitigate policy uncertainty, but more should be done to address problems in infrastructure finance:

- The LSE Growth Commission argued that there would be significant benefits from a **national infrastructure bank focused on infrastructure providing long-term, patient finance, reducing and managing risk and "crowding in" private sector investment**. There are a number of international examples that show the potential benefits of such a bank (including Germany's KfW, and the European Bank for Reconstruction and Development). Post Brexit, such an institution would be still more valuable should the UK lose access to EIB and other EU funds.
- It is also important to ensure that the **Green Investment Bank continues to operate effectively as a development bank post its planned privatisation**. To achieve this, efforts must be made to preserve its benefits (in particular, the implied reduced risk for investors in green technologies following GIB backing, its higher trust than a commercial bank and long-term share structure). This will most likely require legislation.

### Question 16: How can local infrastructure needs be incorporated within national UK infrastructure policy most effectively?

It is unclear whether local infrastructure projects, in isolation, are a cost-effective way of stimulating economic growth.<sup>22</sup> **But infrastructure is one key component in getting the local conditions right for growth.** A holistic systems-based approach is required, that considers the interaction between all types of infrastructure including housing, and local skills. In each locality, it is necessary to understand the combination of policies that are required to move localities into a “virtuous cycle”. High growth areas attract skilled workers, the presence of other skilled workers makes them nice places to live, and firms locate there due to the skill-pool. The reverse is true in places with weak growth. Infrastructure can support the virtuous cycle in successful places, by easing the constraints of congestion but it is less clear whether infrastructure alone can reverse the vicious cycle in low growth areas.

Making informed decisions about infrastructure investment is a challenging enterprise, in many ways different from other policy areas:

- **It is necessary to move beyond standard cost-benefit analysis**, of the type that is used in most government departments. What is required is a robust programmatic analysis of the long-term effects of alternative infrastructure systems across a wide range of uncertain future scenarios. This entails understanding the drivers of demand for infrastructure services in the future, and how different infrastructure configurations might be able to meet that demand.<sup>23</sup>
- It involves considering the ways in which existing economic activities are likely to respond to new infrastructure investments, as well as how these investments may facilitate the emergence of new, potentially quite different, activities. This can only be achieved through a **strategic, network-oriented approach** that goes well beyond a project-by-project analysis of specific investment proposals. The NIC should adopt this type of approach in its assessment of policy options, help to disseminate it across relevant government departments, and stimulate further academic research on the topic.
- It is also necessary to consider **implementation risks** (in skills or the supply chain) and factor associated costs into the analysis. In that sense, the NIC should seek advice from the Major Projects Authority in the formulation of cost assessments to ensure they reflect real-world implementation constraints.

There are various institutional challenges involved. As outlined in our answer to Question 36, the current structure of local and regional governance is not well-placed to deliver place-based challenges. Moreover, while the LEPs have the potential to help deliver successful local economic growth strategies, there is some disjointedness between local government and LEPs and it is unclear how they fit into the evolving devolution landscape. This issue needs to be resolved, so that different levels of government and LEPs clearly understand their roles and remit. It is also important to ensure that they have the resources and expertise in order to deliver on their objectives.

### Question 17: What further actions can we take to improve the performance of infrastructure towards international benchmarks? How can government work with industry to ensure we have the skills and supply chain needed to deliver strategic infrastructure in the UK?

Aside from problems financing infrastructure investment, another key problem relates to obstacles in the planning process which delay or prevent developments which could lead to large economic gains. A weak tradition of engagement, deliberation, and compensation often motivates local communities and other stakeholders to oppose (and prevent) investment in infrastructure projects that impact local areas. The disproportionate political influence of core and marginal constituencies amplifies these forces.

Once it is established that a particular project would generate overall gains, effective mechanisms to share these gains with the communities who bear the costs (typically those who live in the vicinity of proposed sites) are required, possibly involving a combination of financial and non-financial incentives. This requires two things: (i) flexibility in the legal framework and planning process to allow a variety of mechanisms to be employed to this end; and (ii) creative mechanisms that foster active engagement with local communities. A participatory process is needed, where local communities are involved in this process from an early stage.

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<sup>22</sup> For a review of the relevant evidence see <http://www.whatworksgrowth.org/policy-reviews/transport/>

<sup>23</sup> See, for example, Tran et al., (2014)

See our answer to Question 16 for discussion on strategic risks to delivering infrastructure projects.

## Supporting businesses to start and grow

### **Question 18: What are the most important causes of lower rates of fixed capital investment in the UK compared to other countries, and how can they be addressed?**

Investment in equipment and innovation are crucial engines of growth. The UK has consistently fared worse than its main international peers in both these areas, when we consider investment as a share of GDP. Weak infrastructure and skills may hold back business investment, but key obstacles also stem from policy uncertainty, excessive short-termism in business and financial markets and associated problems accessing finance (especially for young, innovative firms).

We discuss the types of issue that need to be addressed to create longer term horizons in UK businesses and financial markets in our answer to Question 19.

Difficulties accessing finance can hold back investment. Firms in the UK have traditionally been dependent on bank finance and the financial crisis of 2008 hit business lending hard, and it has been slower to recover than lending to households.<sup>24</sup> Business lending in the UK is highly concentrated. The top 6 banks account for 70% of the stock of lending to UK firms.<sup>25</sup> As a consequence, the level of credit supply by those banks can be an important determinant of firms' ability to grow and invest. While credit conditions have improved in recent years, some types of firm have not benefited from this, especially small and riskier firms seeking growth financing. This is in line with longstanding evidence of the system's shortcomings in financing productive investment and supporting long-term growth.<sup>26</sup> Overall, economic evidence suggests that tight credit supply to companies could be a factor in the UK's disappointing growth and productivity performance in recent years.

The dependence on bank financing can also hinder longer term investments. Compared to equity finance, debt finance is less conducive to long term investments where returns are uncertain. Better equity markets would help close the gap in the provision of growth capital for smaller and medium-sized businesses (SMEs) looking to expand and enable investment in longer term projects.

A number of policies can help to address these problems and stimulate investment:

- **Improving competition in banking to improve access to finance:** Despite a number of policies aimed at increasing competition in banking in recent years, the sector remains highly concentrated. The UK's new breed of challenger banks are well placed to make the UK banking market more competitive and innovative. Their development could be supported by utilising flexibility on capital requirements for smaller lenders that will now be possible outside the EU.
- **Strengthening the British Business Bank (BBB):** The BBB should be given a pivotal role in supporting the UK's Industrial Strategy. It could play a key role in creating a corporate bond market for SMEs, including efforts to kick-start SME loan securitisation along the lines of its ENABLE Funding programme for asset-based financing. Its role in promoting alternative sources of finance should also be strengthened.
- **Removal of tax distortions favouring debt over equity investment:** The UK tax system favours debt over equity investment. An allowance for corporate equity (ACE) could be designed to reduce the rather arbitrary discrimination and discouragement of equity finance.
- **Boost equity tax relief schemes for investors in growing small and mid-sized companies.** Outside of the EU, the Equity Investment Scheme (EIS) and the Seed Equity Investment Scheme (SEIS) could be expanded since they would no longer be subject to EU regulations on State Aid.
- **Support the FinTech sector.** Government should develop initiatives to boost investment in this sector, including giving FinTech investors clear and enhanced access to tax relief schemes, such as the Equity Investment Scheme (EIS) and the Seed Equity Investment Scheme (SEIS).

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<sup>24</sup> See Figure 1.4 in the LSE Growth Commission (2017) report.

<sup>25</sup> Bank of England (2015)

<sup>26</sup> Bank of England (2017)

- **Promoting new types of collateral:** Short-termism is likely to be particularly acute for funding innovation, due to its high risk. Bank loans are dominated by real estate finance, and private equity investors tend to prefer late stage businesses instead of early stage venture capital for SMEs with high growth potential, due to the high costs of due diligence of intangible assets. Policies to promote the collateralisation of intangible assets would help small innovative firms access finance; and would include the creation of more formal intellectual property systems and markets to allow trading, and the provision of more information or advice for businesses on what is a complex area. The IPO are working on this area<sup>27</sup>, but there may be more of a direct role for government, perhaps through Innovate UK or the BBB.

**Question 19: What are the most important factors which constrain quoted companies and fund managers from making longer term investment decisions, and how can we best address these factors?**

It is well established that UK business and financial markets suffer from short-termism<sup>28</sup> and this was covered in detail in the LSE Growth Commission’s 2013 report. Short-termism can result lower investment, in particular in projects with longer-term payoffs. Often the types of projects that can have a large economic impact are long-term or uncertain in nature (for example, in infrastructure or innovative technologies) so is likely to be one of the factors holding back UK productivity growth.

The new “Patient Capital review” led by the Treasury is a welcome development. Key questions it should explore include:

- How corporate governance requirements, including reporting and investor engagement, should be designed to create incentives for long-term equity investment.
- How the incentives of senior management can be better tied to longer term performance via the design of remuneration packages.
- How large institutional investors, such as pension funds and life insurers, could play a stronger role in supplying long-term finance for growing innovative firms. Institutional investors are “natural” long-term investors due to the often long-term nature of their liabilities.
- To what extent the BBB can scale up its current activities to mobilise long-term funding from the private sector.
- Whether government could use taxes or subsidies to incentivise long-duration share-holdings.
- Whether there are lessons that can be learned from patient capital funds developed by some universities (for example Cambridge Innovation Capital and Imperial Innovations).<sup>29</sup>

**Question 20: Given public sector investment already accounts for a large share of equity deals in some regions, how can we best catalyse uptake of equity capital outside the South East?**

Many of the measures outlines in Question 18 apply here, in particular addressing tax distortions favouring debt over equity investment and boosting equity tax relief schemes for investors in growing small and mid-sized companies.

It is also necessary to provide more information and support to firms about how to access alternative sources of finance. Again, expanding the role of the BBB can help here. But this also links to the need to improve management education.

**Question 21: How can we drive the adoption of new funding opportunities like crowdfunding across the country?**

Data from the SME Finance Monitor survey (**Figure 4**) show that over 60% of SMEs use no external finance at all, and of those who do, bank finance (overdraft, loans and credit cards) is most common. Only 2% of SMEs use “other sources of finance” including crowdfunding, business angels or private equity. This is a smaller proportion of SME finance in the UK compared, for example, to the US. It is likely that the debt bias in the UK tax system

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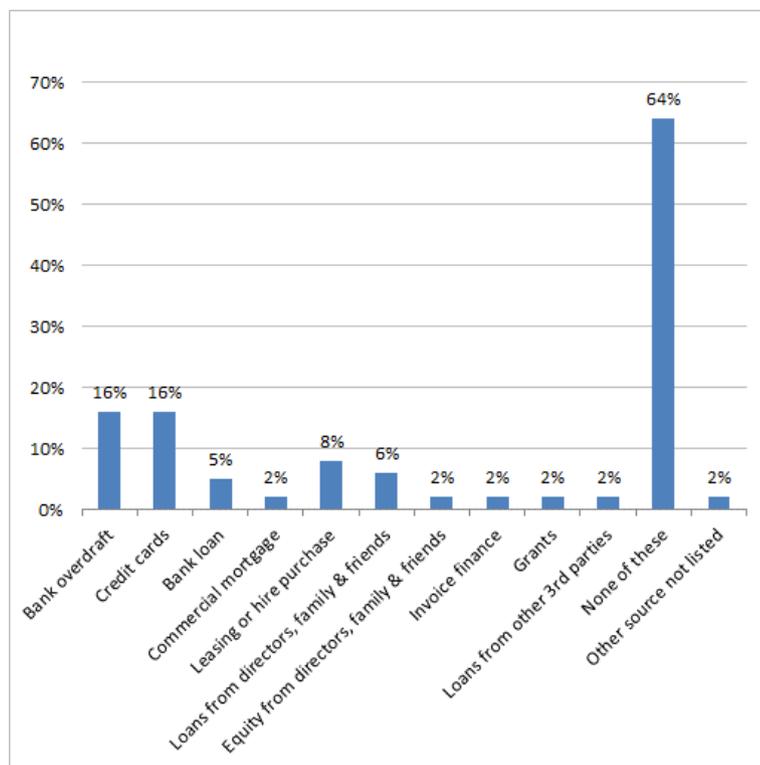
<sup>27</sup> See <https://www.gov.uk/government/publications/banking-on-intellectual-property-ip-finance-toolkit>

<sup>28</sup> See for example Haldane and Davies (2012), the Kay Review (2012) and the Cox Review (2013).

<sup>29</sup> See discussion in House of Commons Science and Technology Committee (2017).

contributes to the reliance on debt finance; but also that a lack of information on alternative sources of finance plays a role.

**Figure 4: SMEs use of external finance (% reported)**



Source: BDRC Continental, Q2 2016 "SME Finance Monitor Survey"

There are a plethora of business support schemes that seek to deal with this. While there is evidence that access to finance schemes have a positive effect of firms' access to debt, the impact on access to equity finance is mixed and available evidence limited. There is a need to collect better data and design policy experiments in this area to gain a better understanding of the types of policy that could be effective.

**Question 22: What are the barriers faced by those businesses that have the potential to scale-up and achieve greater growth, and how can we address these barriers? Where are the outstanding examples of business networks for fast growing firms which we could learn from or spread?**

As previously discussed, the UK needs better equity markets in order to close the gap in the provision of growth capital for SMEs looking to expand. We set out some suggestions on how this might be achieved in our answer to Question 18.

The issue is longstanding and was covered in detail in the LSE Growth Commission's 2013 report. There is a tendency among British firms in high-tech and capital-intensive sectors to be bought by overseas businesses instead of raising and utilizing growth capital<sup>30</sup> – a recent example being ARM which was sold to Japanese firm Softbank in 2016.

While there has been some progress in this area from a policy perspective, for example, via the Growth Fund (BGF) and the BBB, participants in our 2017 Growth Commission evidence session suggested that significant problems remain. We therefore welcome the "The Patient Capital Review" and further policy attention in this area.

<sup>30</sup> See NESTA (2012).

## Improving procurement

### **Question 23: Are there further steps that the Government can take to support innovation through public procurement?**

As highlighted in the Green Paper, government procurement represents around 14% of GDP, and there is therefore huge scope for spending at this scale to support innovation. These funds should be directed towards small and innovative firms building on the Small Business Research Initiative (SBRI).

Public sector procurement should seek to promote innovation and creative solutions to the societal problems in areas where the government is a large buyer: key examples include education, energy supply, air pollution and waste management, and health and social care. Successful procurement strategies can not only help solve such problems but also generate products or services that can be exported to the rest of the world.

We support the plans to continue to promote procurement from SMEs, developing the SBRI via a review into the lessons we can learn from successful programmes in the US. As mentioned in Question 4, lessons can be learned from the success of the BBC and Channel 4, public service broadcasters with explicit remits to commission content from the independent sectors. The UK has a highly successful independent production sector, and the BBC also is obliged to consider the regional impact of its activities. While creative sector employment tends to be concentrated in London and the South East, Competitive processes around commissioning appear to be important for the success of this model.

### **Question 24: What further steps can be taken to use public procurement to drive the industrial strategy in areas where government is the main client, such as healthcare and defence? Do we have the right institutions and policies in place in these sectors to exploit government's purchasing power to drive economic growth?**

In addition, it is important to encourage government buyers of goods and services to take account of social and economic impacts (along the UK supply chain) of their procurement. While the Green Paper points to the defence and healthcare sectors as being particular areas of focus, we propose that the procurement strategy should be embedded in and fully consistent with key "missions" identified by the government in the development of its industrial strategy.

It is clear that in the development of a new "balanced scorecard" new data will need to be collected and analysis conducted in order to understand first the potential impact of different procurement options, and also the retrospective impacts in "value for money" assessments.

## Encouraging trade and inward investment

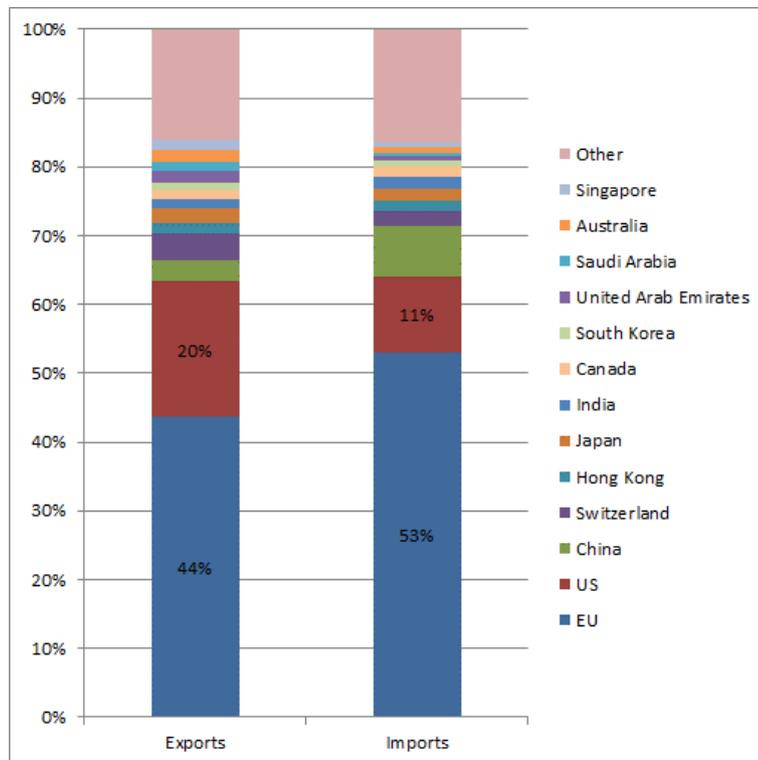
### **Question 25: What can the Government do to improve our support for firms wanting to start exporting? What can the Government do to improve support for firms in increasing their exports?**

Improving the export performance of UK business was already proving a challenge before the Brexit vote. Today's challenge is heightened – the UK must now improve export performance while barriers with its main trading partner (the EU accounts for 44% of the UK's exports- see **Figure 5**) are set to increase substantially. Economic models predict that this will have an adverse impact on trade under a range of scenarios.<sup>31</sup> It is essential that the Government clarifies the relationship between its industrial strategy and its strategy for negotiating the UK's future relationship with the EU. The Green Paper makes much of future potential trade deals with a number of non-EU countries, but does not highlight the importance of the UK's new relationship with the EU in terms of its impact on the UK's future prosperity. The recent White Paper on exiting the EU similarly illustrates a lack of coordination between Brexit and industrial strategy.

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<sup>31</sup> Dhingra et al. (2016a).

**Figure 5: Share of total UK exports and imports by trading partners**



Source: ONS, 2015

As an exporter of goods, the UK is already performing badly compared to its advanced economy peers. While the UK does better in services, the volume of global service trade is much smaller than goods (at around \$5 trillion compared to \$16 trillion). 99% of firms in the UK are small, but only 10% of small businesses export goods or services (the equivalent figure for larger firms is 40%).<sup>32</sup> Recent research into what explains firms' propensity to export suggests that financial factors – including the availability of equity finance – play an important role. Exporting can imply fixed start-up costs, meaning that entrepreneurs unable to access capital cannot finance their exports.<sup>33</sup> CBI analysis points also to a lack of consistency across government policies that support exporters and a lack of awareness amongst businesses with regard to the government support that is on offer.<sup>34</sup> Therefore, policies to promote trade are intrinsically linked to policies to improve access to finance for growing firms, and support to SMEs in general.

Over and above explicit trade policies, it is important to appreciate the extent to which immigration policy will have an impact on exports. A key example is the university sector, which is a significant export industry in its own right. Visa restrictions on students are harming our overseas market at just the time that the UK is seeking to expand its trade agreements/export markets. This again illustrates how it is essential that the objectives of immigration policy are also aligned with the UK's industrial strategy.

**Question 26: What can we learn from other countries to improve our support for inward investment and how we measure its success? Should we put more emphasis on measuring the impact of Foreign Direct Investment (FDI) on growth?**

The UK is already a leading destination for FDI (**Figure 6**). It is host to nearly 10% of the inwards FDI stocks across the OECD and is surpassed only by the US. Moreover, UK inward FDI stocks have been consistently high as a share of GDP compared to the UK's main peers, at around 55% of GDP since 2012. The UK has been attractive for inward FDI due to demand side and supply side factors. On the demand side, UK has offered investors access to a large domestic market of 60 million consumers. But while the UK is a member of the EU, firms have border-free access to a further 440 million consumers. This latter attraction will no longer apply once the UK leaves the EU's Single Market and there is a risk that foreign firms will relocate or that future inward FDI will be

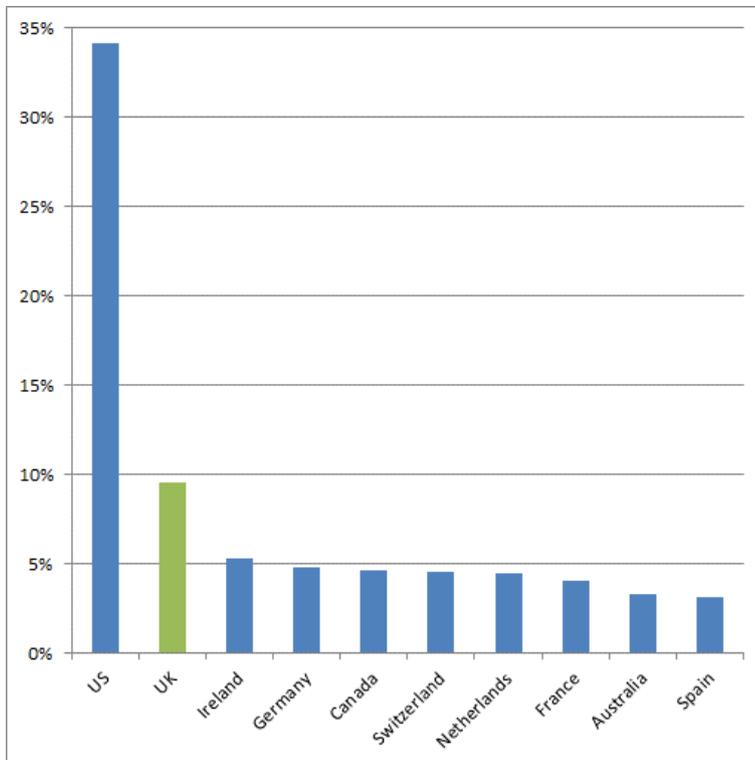
<sup>32</sup> ONS (2014)

<sup>33</sup> See Manova (2013) and Chaney (2016).

<sup>34</sup> CBI (2015).

dampened.<sup>35</sup> On the supply side, the UK has flexible labour markets, a skilled workforce and a strong rule of law. A successful and long-term industrial strategy must build on these strengths, improving our skills base, infrastructure and access to finance to continue to attract international businesses to the UK.

**Figure 6: Share of total OECD inward FDI stocks**



Source: OECD

While inward FDI can and does bring great benefits to the UK economy, the acquisition of UK businesses by foreign companies sometimes results in the transfer of much or all of the acquired operations out of the UK. We have previously discussed the tendency among British firms in high-tech and capital intensive sectors to be bought by overseas businesses instead of achieving “home-grown” growth. This links to inadequate provision of scale-up capital in the UK.

There could be justification for a widening the public interest test, which allows the government to intervene on mergers. One example, much discussed, is where there are risks to the UK science base should a buyer move R&D activity out of the UK. A framework for considering the effects on the innovation ecosystem should be developed, and mechanisms for requiring long-term commitments from purchasing companies.

## Delivering affordable energy and clean growth-

**Question 27: What are the most important steps the Government should take to limit energy costs over the long term?**

*This question is answered together with Question 28.*

**Question 28: How can we move towards a position in which energy is supplied by competitive markets without the requirement for ongoing subsidy?**

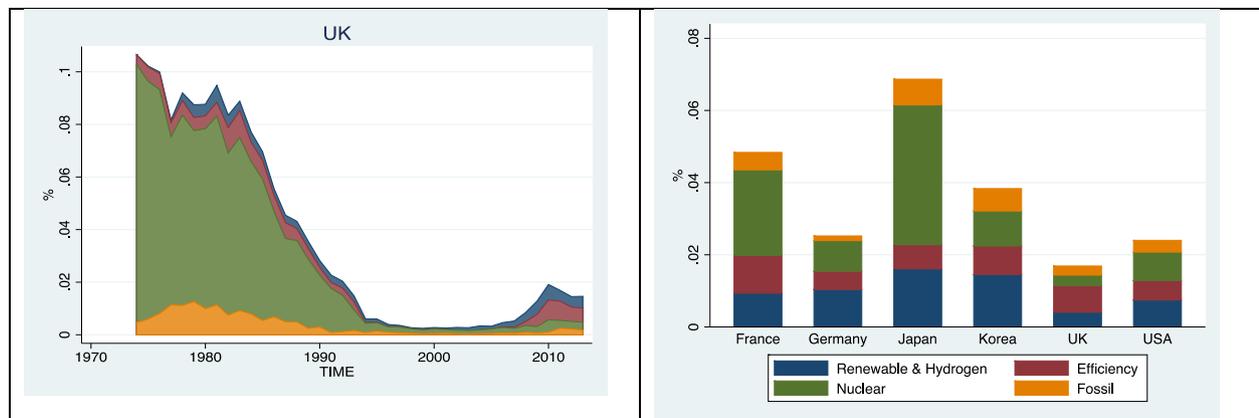
Given the need to decarbonise electricity supply entirely a sharp cost increase in electricity – without subsidy - can only be avoided if existing non fossil fuel based generation technologies become cheaper and new cheap technologies are being developed and deployed. There are in principle three types of policies to support this: (i)

<sup>35</sup> See Dhingra et al. (2016b).

various forms of carbon pricing; (ii) R&D subsidies for “clean technologies”; and (iii) policies to support the increased deployment of clean generation technologies such as feed in tariffs, renewable obligations or contracts for difference (CFD).

Given the interlocking market failures associated with clean technologies, there is a role for all three policy areas. However, it is important to have the right mix between them. In the UK the balance between the areas seems off. Carbon pricing – in the energy sector primarily via the ETS – is rather low.<sup>36</sup> UK public R&D spending & subsidies for energy technology is also low by both historical and international standards (**Figure 7**):

**Figure 7: Share of Government R&D spending on energy technologies**



Notes: Share of R&D spending in GDP over time (left) and latest available year (right)

Source: Authors’ calculations based in IEA data.

The UK government spent around 0.1% of GDP on energy research during the early 1980s in the wake of the oil price shocks. Now the figure is below to 0.02%. Spending is also low - in particular for renewable energy – compared to other economically advanced countries.

The main policy thrust in this area therefore comes from deployment support type of policies – as of late this is primarily the contracts for difference scheme (CFD). From technology development point of view deployment support schemes make sense if the primary factor for further technology development is from learning by doing and if the IP that arises in such learning cannot easily be appropriated by the company that is doing the learning. However, deployment policies provide limited additional incentives for dedicated R&D investments in this area. They also do nothing to help small innovative companies who might be struggling with credit constraints when wanting to undertake R&D in this area. We therefore propose to rebalance the policy landscape in this area by aiming to vastly increase the share of public R&D spending on energy technology. This could be done by more support for basic research of universities in this area. It could also be done by offering differing support rates within the very successful R&D tax credit scheme.<sup>37</sup> Firms could be receiving higher support rates in line with the differing levels of strike prices for different technologies in the CFD scheme; i.e. firms conducting research on less mature energy technologies that receive higher strike prices with the CFD could also receive higher support within the tax credit scheme.

Besides increasing the rate of public R&D support overall it would also seem important to reduce the relative importance of energy efficiency in such support in the UK, for two reasons: Firstly, Energy efficiency is unlikely to lead to the highest returns in terms of carbon reductions. Secondly, as shown in Dechezleprêtre et al. (2014) more radical energy technologies are characterised by higher knowledge spillovers. Hence, government support for them is more likely to lead to positive growth effects (quite a apart from its impact on emissions).

The strong focus on deployment is also misplaced for another reason: it is too much centred on what works and is already fairly established in the UK. However, climate change cannot be successfully addressed without solutions that are geared towards places such as India and China and we likely need technologies that are not yet established. Hence, it could be a good idea to have a form of deployment support that is more geared

<sup>36</sup> Although there is some evidence that this still had a positive effect on innovation (Dechezleprêtre & Calel 2014)

<sup>37</sup> see Dechezleprêtre et al (2016)

towards such long term strategic objective; e.g. create a pot within the CFD scheme that is geared to entirely new technologies and perhaps would allow UK companies to establish generation plants outside the UK.

Besides development of new technologies, the actual cost of clean technologies depends to a large extent on the whole system design and its integration. In the context of the UK this means deeper integration with the European energy markets. Clean energy generation will be orders or magnitudes cheaper if wind power from Scotland is integrated with solar power from southern Europe or if offshore generation assets in the North Sea serve both the UK and continental markets (see the work of Goran Strbac's group at Imperial on this). A big worry is that Brexit might throw a spanner into efforts at further integration.

**Question 29: How can the Government, business and researchers work together to develop the competitive opportunities from innovation in energy and our existing industrial strengths?**

To design efficient energy markets and develop new business models within them it is crucial to have the best possible data. It turns out that BEIS has very detailed energy consumption data available that is only being shared on a very limited basis (e.g. some of this data was used in Martin & Muuls (2015)). We encourage to make this data more widely available (e.g. via a secure data lab) so that more research can be conducted with it to help both policy and companies operating in this space.

**Question 30: How can the Government support businesses in realising cost savings through greater resource and energy efficiency?**

Recent research has shown that various existing schemes to improve energy (and carbon) efficiency such as the CCL and the CRC are quite effective in bringing about energy efficiency improvements (see Martin et al. (2014), Martin and Muuls (2015)). In ongoing work Martin et al. are also showing that the EUETS is effective in reducing carbon intensity. However, the current system is highly inefficient because different firms face highly different effective rates of carbon pricing, primarily because of the CCA exemption. There could be differences exceeding £30 per tonne of carbon between different firms. This can hardly be efficient. We would encourage the government to work towards a more harmonised approach.

## Cultivating world-leading sectors

**Question 31: How can the Government and industry help sectors come together to identify the opportunities for a 'sector deal' to address – especially where industries are fragmented or not well defined?**

Government can act as a co-ordinator, for industry, researchers, regulators and investors who might not otherwise come together, and encourage them to address common problems collectively. We support building on the approach in the Coalition's industrial strategy, that identified 11 key sectors that were all judged to be strategically important, "tradable" and with a "proven commitment to innovation". Based on these criteria there has long been a strong case for extending support to the creative sector and we support the early sector deals on the creative industries.

But it is important that processes for granting support to particular sectors are competitive, transparent and based on a real understanding of whether there are market failures that government can usefully address, in order to avoid policy being influenced by the lobbying of incumbents with outcomes that are not necessarily beneficial for the UK economy as a whole. Evidence provided to the BEIS select committee on industrial strategy has suggested that some sectors have benefitted from sectoral support - in particular aerospace and the automotive sectors - but that there has been less benefit in others, such as construction.<sup>38</sup> Strong and transparent institutions governing the UK's industrial strategy (as we set out in our answer to Question 3) can help to justify the grounds for sector-based support.

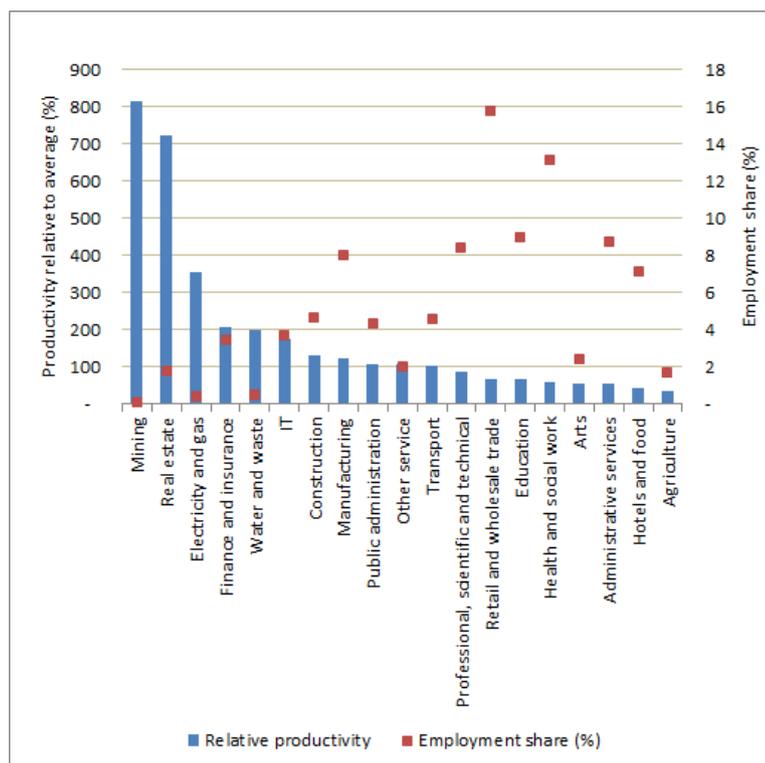
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<sup>38</sup> BEIS Committee (2017)

In light of the specific risks facing certain sectors post-Brexit – for example financial and professional services, it is important that the sector focused elements of industrial strategy are co-ordinated with Brexit negotiation strategy.

We also argue that it is not only high-performance-high growth sectors that might need to come together to address common challenges. But there are a number of lower productivity sectors which employ a large share of the population, and where there are obstacles to growth that the government can help address. In the market economy, retail and wholesale trade, hotels and food, and administrative services all have low average productivity and pay, and account for over 30% of total employment (**Figure 8**). Raising productivity in low-productivity low-pay sectors could have large aggregate effects and also help to reduce wage inequality. It has been estimated that if the productivity of these sectors were raised to match levels in France, Germany and other European countries, the UK could close a third of its aggregate productivity gap with those countries.<sup>39</sup>

**Figure 8: Sectoral productivity**



Notes: 2015 GVA/employment relative to average =100. Source: ONS

Where industries are fragmented or ill-defined, a “mission-oriented” approach can help to bring together all relevant companies or technologies, and have the benefit also of potentially addressing key public policy challenges in areas such as health, social care, and pollution management. For example, the early sector deal on the transition to ultra-low emission vehicles mentioned in the Green Paper could be part of a wider mission on improving air quality in cities, which could include other relevant sectors or technologies, and a number of complementary government levers – for example procurement of low emission bus fleets, and government regulation or incentives to raise consumer demand for these types of vehicle.

**Question 32: How can the Government ensure that ‘sector deals’ promote competition and incorporate the interests of new entrants?**

The process for evaluation and resource allocation needs to be independent, depoliticised and based on competition where possible. Experience with science funding to date shows that the support infrastructure exists for this, with competitively awarded science function in the REF and via research councils. The existing EU State Aid framework has prevented arbitrary forms of political intervention in the economy. Developing a

<sup>39</sup> See Spencer et al. (2016)

new legal framework to replace it is essential once the UK leaves the EU. This will help to ensure that the new industrial strategy is competitive and contestable.

Clear rules for intervention in particular sectors, technologies or places are required and should be published. These should build on the criteria developed by the Coalition government which relate to high productivity and high growth potential technologies or sectors, but be extended to include grounds for intervention in low-productivity sectors where significant market failures are holding back productivity. Government should set out the process through which it has started work on the early sector deals set out in the Green Paper (in life sciences, ultra-low emission vehicles, industrial digitalisation, nuclear industry and the creative industries). In addition, government should provide more clarity on the status of the “11 key sectors” (and 8 key technologies) which were identified in the Coalition’s industrial strategy.

### **Question 33: How can the Government and industry collaborate to enable growth in new sectors of the future that emerge around new technologies and new business models?**

Improving the finance available to innovative and high growth businesses, and ensuring that the UK remains open to top talent are likely to be the crucial factors for enabling the growth of new sectors of the future.

Because new sectors cannot be identified in any “sector deals”, horizontal policies are likely to be the most important in this regard. However, to the extent that such sectors of the future might be related to solving the problems of the future – enabling growth in new sectors could be a by-product of a “mission-oriented” approach.

## Driving growth across the whole country

### **Question 34: Do you agree the principles set out above are the right ones? If not what is missing?**

We support the principles outlined in the Green Paper. We would add the following points to them.

- **Backing local connectivity with strategic infrastructure investment.** The establishment of the NIC will improve the ability of government to take a longer term and systems based approach to infrastructure. But there are still significant challenges in stimulating private sector investment in infrastructure and overcoming obstacles in the planning process. While additional funding commitments made by government are welcome, we have argued that a national infrastructure bank could help to reduce and manage risk and “crowd in” private sector investment, and that such an institution could be all the more valuable post-Brexit if the UK loses access to EU assistance programmes, which is likely. We have also argued that cities and local developments should be environmentally sustainable, and therefore the Green Investment Bank is a valuable institution in this regard. It is vital that its advantages are preserved post its planned privatisation. In order to overcome obstacles in the planning process, more consultative and creative compensation mechanisms are required in order to obtain planning permissions for potentially valuable projects.
- **Raising skills levels nationwide but particularly in areas where they are lower.** We support the emphasis on going beyond national reforms to address area specific issues. But government must set out how both of these goals are to be achieved in a resource constrained context (the IFS has estimated that school spending will be 8% lower by 2020) and how it will deal with conflicts and trade-offs between these two objectives.
- **Investing in local science and innovation strengths.** We support the plan to ensure that funding is allocated on a competitive basis to support all types of innovative activity. While the benefits of many innovations are felt far and wide, there is robust evidence that university research activity does create externalities in local firms.<sup>40</sup> Fostering university-business linkages via LEPs and building on the Catapult network are important mechanisms for raising local innovation.

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<sup>40</sup> See for example Jaffe (1989), Jaffe et al. (1993), Belenzon and Schankerman (2013), Hausman (2012) and Kantor and Whalley (2014).

- **Government procurement to drive local innovation.** Government procurement can be an effective tool for driving growth across the country, and the local/regional effects of procurement policies should be an explicit factor in decision making.

**Question 35: What are the most important new approaches to raising skill levels in areas where they are lower? Where could investments in connectivity or innovation do most to help encourage growth across the country?**

Disadvantaged areas tend to have worse educational outcomes. Therefore the UK's national policy in terms of improving outcomes for disadvantaged children is intricately related to more localised policy.

Teacher quality is a crucial factor in understanding variation in pupil outcomes. Research has shown that variation within schools is several times greater than between schools: who you are taught by matters much more than which school you go to.<sup>41</sup> It has been estimated that if the bottom 10 per cent of teachers were as effective as the average teacher over a period of 10 years, the UK's position in OECD rankings would improve to fifth place in maths and third place in reading (Murphy, 2011). Most studies find that improvements in teaching are most effective for disadvantaged pupils.<sup>42</sup> There are around 440,000 teachers in UK state schools and 37,000 new teachers are trained annually. Therefore efforts to improve recruitment and training can only act gradually, and must be accompanied by action to enhance training among existing teachers.<sup>43</sup>

Policies to improve initial teacher training could include making it easier to enter training, but harder to qualify. This would make it easier to assess the quality of potential teachers as more information is known after a period of training. Continued training for existing teachers is important, with a focus of transmitting skills within schools to underperforming teachers. More engagement with the findings of research should become part of teacher training and practice in schools (BERA, 2014).

Underperforming schools in disadvantaged areas find it hard to attract high quality teachers. The schools funding formula has long been in need for reform, as it was based on a historical "spend-plus" methodology which did not adequately reflect local costs, especially in deprived areas. Government has recently announced proposals to reform the schools funding formula, so that historically lower-funded local authorities increase their allocations. But this will be at the expense of schools in London and other urban areas that have historically received higher funds, and importantly will be set against a background of real-terms cuts in school spending estimated at 8% per pupil by 2019-20.<sup>44</sup> This will be the first time since the mid-1990s that school spending has fallen, and the real-terms cut is the largest since the 1970s. These budgetary pressures risk harming educational outcomes, at a time when there are already concerns about the UK's performance compared to other countries'.

The planned improvements to the FE and apprenticeships system to improve the quality and clarity of these routes are necessary. We refer to our colleagues' from the CVER submission on the detail in this area, but note that it is crucial that reforms to FE are lined up and consistent with the industrial strategy. For example, the retail sector is notably absent from the new full-time technical routes and there is a strong case for government action to address obstacles to productivity growth in this low-pay, low-productivity sector

Continued increases in the total costs of university education are likely to create a tension with opening up access to poorer families. Evidence suggests that the conversion of maintenance grants to loans (a more recent policy, which took effect from September 2016) is likely to hurt applications from poorer students.<sup>45</sup> There may be scope therefore for local governments to consider localised schemes of support if there is concern that young people are being deterred from further study.

The LSE Growth Commission has recommended new tax breaks for skills investment, which could take the form of a Skills and Training tax credit. This type of policy would need to be carefully designed to ensure additionality and that money was spent on high quality skills provision that adds to employability, career progression prospects, and to worker productivity. Such a skills development and training strategy requires close interaction between employers and well-resourced technical/adult education colleges and therefore will involve a spatial element in its effective design.

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<sup>41</sup> See OECD (2009), or Reynolds (2007) for more discussion on "Within School Variation" (WSV).

<sup>42</sup> See evidence given to the House of Commons (2014).

<sup>43</sup> See chapter 6 in Cassen et al., 2015

<sup>44</sup> IFS (2016)

<sup>45</sup> See Dearden et al. (2014) and Dynarski (2003).

Some focus on entrepreneurial training, “soft” skills and encouraging resilience in schools and beyond can also help boost the next generation of entrepreneurs which could provide a boost to local areas.

## Creating the right institutions to bring together sectors and places

### **Question 36: Recognising the need for local initiative and leadership, how should we best work with local areas to create and strengthen key local institutions?**

As we have discussed, the current structure of local and regional governance is not well-placed to deliver place-based challenges. This explains the long-standing failure to deliver housing as means of supporting regional growth initiatives. Delivery of housing needs to be tied to delivery of infrastructure and to provision of public services, and indeed skills strategies.<sup>46</sup> Moreover, while the LEPs have the potential to help deliver successful local economic growth strategies, there is some disjointedness between local government and LEPs and it is unclear how they fit into the evolving devolution landscape. This issue needs to be resolved, so that different levels of government and LEPs clearly understand their roles and remit. It is also important to ensure that they have the resources and expertise in order to deliver on their objectives.

“Smart” cities should be at the heart of regional development policy. There are five key components to this. First, attractive and liveable cities are most likely to attract talented and creative individuals. Second, compact and well-connected cities improve the ability to match workers to jobs and raise the efficiency of infrastructure networks. Third, harnessing new technologies and systems in the design of local infrastructure can generate spillovers for the rest of the economy (for example green technologies). Fourth, it is crucial to invest in local skills and education to raise productivity and reduce inequalities. Finally, moving forward the devolution agenda with greater fiscal autonomy for city regions, better planning laws that share benefits among citizens, more constructive approaches to local community engagement, and reform of local public finances. These measures can help to remove barriers and stimulate the significant private sector financing required for smart urban infrastructure development.

### **Question 37: What are the most important institutions which we need to upgrade or support to back growth in particular areas?**

LEPs and local government need to be adequately resourced and clear in their roles and remit, with locally focused objectives consistent with the nationally determined industrial strategy.

Universities are key actors in policies for places, improving regional economic performance via their role as producers of skills and incubators of innovative firms. Moreover, researchers in the social sciences can work with local policymakers and other stakeholders in the design of place based policies. There is enormous potential when universities work in they partnership with ambitious city and regional leadership and it is important to create more engagement between universities LEPs and local government.

### **Question 38: Are there institutions missing in certain areas which we could help create or strengthen to support local growth?**

We believe that a new institutional framework governing industrial strategy would be key to its success. We set this out in our answer to Question 3, but in brief what is needed in the government’s industrial strategy is more than a collection of policies, but a fundamental reform of the institutions governing it so that industrial strategy can be truly long-term, joined up and understood by the main actors involved in it. We propose:

- A new law or long-lasting mandate, including a new state aid law;
- A set of public guidelines for intervention;
- Independent decision making or oversight;
- Enhanced transparency and accountability; and

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<sup>46</sup> See NIC (2016)

- External debate and scrutiny.

This type of framework would help coordination between the different government departments and levels of government who will be responsible for different elements of the industrial strategy.

Crucially, there needs to be an explicit analysis of the trade-offs between different objectives, such as the tension between policies that raise nationwide educational outcomes versus policies that raise educational outcomes for particular groups in particular areas.

With the trend towards devolution and the agreement of a number of City Deals over the last few years, a number of important policy levers that can help to deliver an effective industrial strategy are now at the level of nations and regions, including skills, innovation and infrastructure. The devolution agenda and regional initiatives will need to be underpinned by a national strategy to deliver policies that are tailored to each part of the UK's industrial strengths, and the right balance between local initiative and central direction. The proposed Ministerial Forums on Industrial Strategy within the devolved administrations are a promising mechanism for coordinating different departments in Whitehall with devolved governments.

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