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UK Productivity & Skills: A Briefing

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Context of this briefing

This Briefing Paper is a short version of the first White Paper on the UK trade, part of a series of research outputs of the Lloyds Banking Group Centre for Business Prosperity (LBGCBP). These research outputs will be presented under two broad headings, each being led by a whitepaper and subsequent research papers:

- **Stream 1 – Making the UK a more effective trader**
 - White Paper 1: UK Trade in The New Globalised World
 - Research Paper 1: On the Determination of Sectoral UK Exports
 - Research Paper 3: Defying Gravity? Policy Uncertainty and Trade Diversion
 - Research Paper 5: An Export Strategy for High Growth
 - Research Paper 7: Non-tariff Barriers and the UK Trade

- **Stream 2 – Skill challenges, productivity and prosperity in the UK**
 - White Paper 2: Productivity, skills and economic growth in the UK
 - Research Paper 2: Individual Ownership, Age of Firm, and Productivity
 - Research Paper 4: Path-breaking to innovate: The Internet of Things (IoT) technologies
 - Research Paper 6: Management Training, Productivity and Firm Growth

Each paper will be accompanied by a briefing paper.

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Productivity is key to economic growth, and at the level of the firm is a good predictor of survival and long-term success. The UK presents two productivity problems; a slower growth in productivity than other comparable economies for decades, and virtually zero growth in labour productivity since the 2008 financial crisis and that the latter is referred to as the **UK productivity puzzle**.

This Briefing offers a perspective on what appear long term problems, and takes stock of the existing understandings of the UK productivity puzzle, and the evidence on the links between skills and productivity, at national, regional and firm levels.¹

Key Productivity Factors

Factors of production (labour and capital) and other factors affecting productivity (such as innovation) show patterns that explain the UK's weak productivity.

Factor Inputs

During the recession since 2008, what followed the sharp fall in aggregate demand was a much milder decline of labour inputs. A continuing improvement in employment combined with sluggish output would almost inevitably have led to recorded lower labour productivity and hence lower real wages.

On capital investment, the investment to GDP ratio has remained drastically below its pre-crisis levels. Low capital investment is widely recognized as a reason for weak productivity.

Innovation & Research

The overall picture suggests that the UK is one of the leaders in knowledge creation and research excellence, measured in terms of scientific article citations. However,

¹ Detailed references are not included in this Briefing but can be found in the White Paper.

the UK's R&D investment has been low and seems lagging in the fields of Industry 4.0 domains. The comparison with top investing countries reveals lower R&D spending in proportion to GDP in the UK than in other major economies in the world. The UK spent 1.67 per cent of GDP on R&D in 2016, ranking 11th in the EU.

In most OECD countries, R&D is mainly driven by business enterprises. However, the UK business sector's R&D is lower than the OECD average.

Human capital and skills

We focus on the skills factors that are embedded in human capital and that determine productivity and long-run growth. The fall in real wages and hence the reduced capital-to-labour ratio explain the fall in **labour productivity**, but the UK has record high employment levels compared to most OECD countries, and existing evidence suggests that the weakened labour quality is not mainly driven by the UK's flexible labour market.

In recent years, the UK has improved at each skill level and is expected to continue to improve. However, the UK performs comparatively well on high skills, while facing **challenges on intermediate skills and low skills**, compared to international peers. By contrast, UK tertiary education attainment has improved over the last decade. More than 46% of adults in the UK aged 25-64 years old have some form of tertiary education, compared to an OECD average of 37%. The UK also has higher proportions of university student enrolment in science, technology, engineering and mathematics (STEM) subjects: 13% compared to the OECD average of 6%, in 2015.

The evidence consistently narrates a story of skill shortages, skill gaps and skill mismatches in UK workplaces. The comparative statistics show that the UK is lagging behind on **vocational education** and training. The job prospects of many adults are restricted by their poor literacy and numeracy skills, while the chance of further learning and education is limited.

The UK Productivity Puzzle: No Single Factor and No Firm Conclusion

Measurement issues do not fully explain the causes of the productivity decline over time, nor do they explain the divergence of the UK recovering from the financial crisis post 2008.

The **global demand shortfall** has also been followed by weakened consumer confidence, intensified by UK government austerity, adding up to a persistent effective demand failure. However, there are suggestions that demand failure cannot explain the prolonged period of reduced productivity growth.

Labour hoarding is one of the explanations put forward, with low levels of employment contraction during the crisis. This theory falls short in explaining continuing weak productivity after 2011, when employers would have had enough time to react to weak demand, or in explaining the sustained employment growth of 1.6 million over 2012-2015.

Falling real wages in the UK have become a characteristic of the sluggish response in the labour market to output decline. Real wage growth in Britain nevertheless started to decrease in the early 2000s, before the recession. Labour was made relatively cheap for employers, hence there was a stronger incentive to substitute labour for capital, and to delay upgrading capital-intensive assets which would enhance productivity. Although real wage levels and labour hoarding appear to share a strong movement, there is so far no robust evidence to prove a causal relationship.

Around half a million jobs were lost in the public sector after 2010 as part of the austerity programme, and the private sector added 1.7 million jobs between 2012 and 2015. However, the evidence suggests that many of these **Self -Employed** jobs are low-productivity, often part-time, zero-hour contract jobs and self-employment, with lower pay, less training provided and poor skill utilisation.

Several studies point out that the financial crisis has resulted in a misallocation of capital to less productive firms, many of which are small. Lower wage levels and low interest rates have supported low costs of business survival, while a restricted access to finance may explain the lower entry rates and higher death rates of firms. The weakened level of demand and the uncertain economic and political environment also dampened incentives to invest in innovation and upscaling. These amount to the problem of **Resource Misallocation** to in the economy.

Technology and Skills as the Pillars of Long-Term Productivity

Technology is fundamental to productivity growth and its adoption and diffusion requires skills. Hence, skills, embedded in human capital, are vital to a firm's productive performance. Not only the right level of skills, but also the right amount of skills, placed where and when they are needed impact on if and how evolving technology drives growth. Hence the problems of mismatch of skill demand and supply, namely skill shortages and gaps, matter. Skills gaps and skill mismatches are hardly surprising phenomena for an economy experiencing technological advancement. Dealing with skills problems requires forward-looking policies and instruments to reshape skills to meet the new demands.

There is consensus that the creation of new technologies (i.e. innovation) and their subsequent adoption (i.e. diffusion) require different types of skills. It is argued that the impact of technology leads to rising relative demand in relation to well-paid skilled jobs, which require non-routine cognitive skills; and rising relative demand in relation to low-paid least-skilled jobs, which require non-routine manual skills. Nevertheless, demand will fall for 'middling' jobs, which have required routine manual and cognitive skills. This trend implies that for the UK, where competitiveness hinges on innovation, high levels of education and skills are needed to sustain growth.

In practice there are empirical difficulties in assessing skill gaps. Skill levels are often proxied by educational attainment, which is an imperfect measure, as formal education ends for most individuals in their early twenties, and yet they can acquire skills subsequently. The formal education measures used for skill levels raise measurement

problems, as do the self-reported measures of skill gaps, often with reporting bias by employers. Another challenge is to ensure that the link found between skills and productivity is causal, i.e. that skills do have an impact on productivity, rather than that productivity drives skill acquisition.

At **national** level, earlier work that considered skill gaps found a strong link between skill shortages and productivity growth. In 1993 it was estimated that if Britain's skill shortages grew by the European Communities average, UK productivity growth in the period would have been 5.1% per annum, 0.4% better than that which occurred. This study also found that skill shortages are more influential in reducing productivity in industries where there is a greater concentration of skilled labour. The evidence also suggests that reported skill shortages lead to decreased short-term R&D expenditure and decreased long-term fixed capital investment.

The **regional** perspective acknowledges the presence of knowledge exchanges between workers within an area. Tacit knowledge is found to be particularly transferable through human interactions and depends upon the firms' existing absorptive capacity. High skill levels may play a role in creating even higher skill levels in the area. Or vice versa, skill gaps may reduce the exchange of knowledge within a region and create less opportunity for learning effects, slowing productivity further. Little evidence is available to directly test the concept of skill mismatch, though a study of high growth firms showed that in an industry-region where there were more fast-growth incidents in terms of employment, the average employment growth of the rest of the cluster seemed to dwindle, with the UK's peripheral regions in particular suggesting there was potential competition for skills and talents.

One researcher showed that more of the variation in labour productivity differentials came from unproductive sectors in certain regions than was due to the allocation of sectors to regions or to specialization in the regions. These sectoral productivity differences between regions partly resulted from the skills and occupations composition of the employees in the region.

Empirical work linking **firm** level skill problems and productivity is scant. Routine data are not associated with skills information, and skill surveys do not have measures of productivity. One plant level analysis estimated the relationship between total factor productivity, including the percentage of skill gaps within the firm, showing that plants experiencing skill shortages were less productive than those which did not have skill gaps.

The majority of skill shortages are expected to be found in relation to experienced professionals. This signals that expanding Higher Education will not provide the necessary skills to improve performance, and training may be more appropriate. Similarly, a move away from education levels as a key variable, and towards skills analysis, is important, with exploration of skill gaps providing a valuable alternative to the current skill levels evidence about productivity.

Conclusions

There is not one single factor causing the UK's productivity problems and it is the long-term slow productivity growth that is a real challenge to current understanding. Skills gaps and skill mismatches are hardly surprising phenomena for an economy experiencing technological advancement. Skill gaps, however, are detrimental to productivity, and reduce R&D spending and capital investment, which in theory restrict productivity growth. This means that skill gaps are the most constraining, be they of high, medium or low skills levels. Evidence seems to suggest that both skills levels and skills gaps hamper firms' performance, both directly, and indirectly through innovation.

While focusing on the complex relationship between technology, skills and productivity, we also acknowledge the importance of other aspects of the long-term productivity challenge, such as the inter-connection between technology, market structure and market power, and the implications for productivity. Other relevant aspects are the conditions of international trade and global value chains. The microstructure of the industries of a nation determine the job opportunities and hence the required skills set. But this microstructure is not permanent, for it depends on what

others do in the global marketplace. Hence, it is too narrow to focus on the UK's productivity issues within a sector and in a specific place. A global view is essential for productive analysis.



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