

A Concerted Effort to Tackle the UK Productivity Puzzle

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ABSTRACT

The United Kingdom has suffered an extreme version of the “productivity puzzle” – the strong and largely unexplained slowdown in productivity growth among OECD economies since the mid-2000s. In recognition of the challenges that weak productivity growth and low levels of productivity create for economic performance, living standards, and distribution of income across regions, a new research institute has been set up to advance the understanding of the problem. The Productivity Institute will create a comprehensive and interdisciplinary research agenda and contribute to the frontier of knowledge creation in productivity research in the UK and around the world. The Institute will focus on innovative ways to improve productivity performance, providing new insights to help policy and business leaders understand better how to raise productivity and thereby raise living standards in a sustainable manner. This article outlines the overall approach to research, engagement and capacity building by the Institute.

In recent decades productivity has become a major drag on the British economy. The long-term underperformance of productivity threatens economic growth and shared prosperity across the nation. The UK’s productivity puzzle has many dimensions, manifesting themselves differently across regions and sectors. This includes low productivity growth by inter-

national standards since the mid-2000s, a large number of low productivity firms, and large variations in performance across and within regions. Yet, at the same time, there are examples of innovation flourishing (even in some of the worst performing regions) where sectors, firms and local business initiatives are generating new products, services and ways of working.

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Several short- to medium-term developments present fresh challenges to the UK's productivity performance. In the short-term, the COVID-19 crisis and the associated recession have created an unprecedented fall in output and productivity. As the economy recovers the opportunities to raise productivity provided by new technology and innovation may be offset by damage to and scarring of underlying sources of productivity growth, in particular labour. Business dynamics will shape the extent to which ailing firms are replaced by firms that are more productive. The implementation of Brexit will provide challenges to productivity in the tradeable sector of the UK economy through impacts on supply chains, market access, and firms' locational choices. Non-tradable sectors will be impacted through new immigration rules.

In the medium- to long-term important societal transitions will provide opportunities for productivity growth but can also exacerbate the problem and worsen the trend if not addressed in a systematic and coordinated way. While new technologies offer great potential for faster productivity growth, their slow and uneven adoption, as well as specific challenges such as cyber and data security, pose further productivity risks. Similarly, without appropriate coordination of activities the drive towards net-zero carbon emissions could be detrimental to productivity.

The Productivity Institute, made possible by an initial five-year investment of £26

million by the UK Economic and Social Research Council (ESRC) complemented by a £6 million contribution from its nine participating academic and research institutions, is a response to these challenges. It will pinpoint the causes of the stagnation in UK productivity and identify new and innovative solutions, laying the foundations for a new era of sustained and inclusive productivity growth.² More specifically, its objectives are to:

- Advance the understanding of UK productivity performance with an agenda that identifies gaps, supports frontier research, and facilitates interdisciplinary work.
- Act as a transformational national hub, with extensive regional reach, bringing together academics and stakeholders from private, public and third sectors to develop innovative research, policy ideas, and business practices.
- Build capacity across universities, businesses, policy bodies and public and third sector organizations through engagement, fellowships and funding.

The first section of the article summarizes our current understanding of the productivity puzzle in the UK in an international and regional context. The second section discusses the contours of a research agenda around eight initial research themes, including human, knowl-

² The nine institutions are the University of Manchester, where the Institute is headquartered, the University of Cambridge, Cardiff University, the University of Glasgow, King's College London, the National Institute of Economic and Social Research, Queen's University Belfast, the University of Warwick, and the Economic Statistics Centre of Excellence (ESCoE).

edge and organizational capital; geography and place; macroeconomic trends and policy; institutions and governance; social, environmental and technological transitions; and measurements and methods. The last section addresses how the Institute will implement its research agenda by directly linking it to the business and policy needs at national and regional level in the UK.

This article outlines the overall approach to the research, engagement and capacity building programmes by the institute. A comprehensive research agenda and implementation plan will be available in the spring of 2021, based on a series of workshops and the production of scoping papers. These papers will take stock of research knowledge and also assess the challenges across five regions in England as well as the three devolved nations, Northern Ireland, Scotland and Wales. The research program will contribute to the advancement of knowledge creation on productivity issues around the world, and connect with research institutions and policy organizations internationally.

Why Does UK Productivity Lag and How to Close the Gap?

It should be noted upfront that the slowdown in productivity growth over the past two decades is not a unique UK problem, and the phenomenon has been widely documented across advanced economies (OECD, 2019; Bauer *et al.*, 2020) and for the global economy (Dieppe, 2020; The Conference Board, 2020). There are multiple causes for the productivity slowdown. One global effect stems from an exhaustion of catch-up potential in emerging markets, which has also impacted other coun-

tries with which they trade. The drag from the global financial crisis is manifest through low demand, weak investment, inappropriate fiscal policies, and too low interest rates causing misallocations (Cette *et al.*, 2016; Syverson, 2016; Fernald *et al.*, 2017). There is evidence that the low hanging fruit from innovations has begun to dry up, and that there exists a significant time lag between invention and adoption of new (mainly digital) technologies (van Ark, 2016; Crafts, 2018; van Ark *et al.*, 2020).

Nevertheless, the productivity performance of the United Kingdom lags other advanced economies in at least three ways. First, since the 1960s there has been a persistent gap in levels of productivity compared to other countries at similar levels of development. Whereas UK output per hour was at about the same level as that of the EU-15 (that is excluding the new member states from Central and Eastern Europe) in the early 1960s it had dropped to more than 15 percent below the EU-15 level by the late 1970s, although it gained some ground during the 1990s and early 2000s (The Conference Board, 2020).

Second, since the mid-2000s UK productivity growth has weakened more than in other countries: between 2004 and 2019, EU-15 labour productivity increased at 0.6 per cent compared to a UK rate of 0.4 per cent. Hence, the relative gap has widened.

Third, the gap in productivity across regions in the UK is much wider than among regions in other OECD countries; in the UK the disparity between the most productive region (Inner London West) and the least (Cornwall) was more than 2:1 in 2017, whereas such differences are much smaller in other European countries where they are

typically between 1.3 and 1.8, with the exception of Poland and Romania (Zymek and Jones, 2020). More detailed analysis shows that this is not just a reflection of London being a high productivity outlier. There are large productivity differences between regions, and many large UK cities do not have the high productivity that is associated with city size in many other countries (McCann and Vorley, 2020).

The proximate reason for the UK's poor productivity record is a chronic underinvestment in its key growth drivers. Productivity is driven by technological change and innovation which, in turn, depend on investment in human and physical capital, as well as in other "missing capitals" such as intangible assets. The UK is in the bottom third of OECD countries for the share of output going to fixed capital formation, R&D spending, and hard and soft infrastructure investment (Mason et al., 2018). There are likely gaps in human capital, physical capital, and intangible assets, although those are poorly measured.

The deeper question is, why is the UK lacking – or misallocating – these complementary investments? In order to understand these issues research is required into the obstacles faced by people, firms, and places in attaining the capabilities required to invest and to achieve higher levels of productivity. One factor relates to the incentives created through public and private financing of productivity supporting investments. Another factor relates to the coordination of productivity-enhancing policies, including industrial policy, labour market policy, competition policy, science, innovation and education policies. Important culprits may be fragmented decision

making and the absence of well-functioning ecosystems involving business, government and research institutions at local, regional and national level, which operate in a coherent, coordinated and long-term manner. Many policy initiatives suffer from over-centralization, a top-down approach, short-termism linked to the electoral cycle, silos and the absence of effective joined up government, as well as lack of meaningful engagement with stakeholders (both governmental and non-governmental) beyond Westminster and Whitehall, and a disjointed, constantly changing approach to both policy-making and policy-delivery (Jones, 2016).

Widening the lens beyond the specific UK issues, while productivity is generally understood to be the only source of sustained economic growth, there is much less clarity about how it contributes to broader performance measures, such as living standards, well-being, a fair distribution of incomes and opportunities, and the creation of a net-zero carbon economy. The distribution of the gains from productivity growth depend on the sectors, places, and workers that experience productivity increases, and there are particular concerns about the effect of labour saving technological progress on the distribution of income. Understanding the distributional effects that follow from these drivers of productivity growth is as important as understanding their aggregate impacts.

Contours of a Research Agenda

To substantiate the diagnosis of the productivity puzzle outlined above, The Productivity Institute will initially organize its research around eight themes, and our mo-

tivation for picking these themes is outlined below. Over the next few months the Institute's research team will develop the key research questions and approaches. The themes will expand and evolve over time, as researchers work across disciplines including economics, management and innovation sciences, political science, sociology, psychology, engineering and data science, to look systematically for innovative approaches and methods. It is likely that some of the solutions to tackle the productivity puzzle will be found at the nexus points where research questions touch on multiple themes.

Three of the eight themes are organized around the core areas of complementary investments: human capital, knowledge capital and organizational capital.

Human Capital

The UK labour market is characterized by strength in high-end skills, but is weak on vocational skills and has a relatively low level of basic skills such as numeracy and literacy (Rincón-Aznar *et al.*, 2015). The supply of skills through the school and higher education system is thought to be problematic, as the UK educational system has traditionally placed greater value on academic attainment and lower value on vocational skills compared to comparator nations such as Germany and France.

There has been a highly elastic supply of labour from EU countries, many coming from places with significantly lower wages than the UK. And there is a high degree of labour market flexibility, particularly relatively low firing and hiring costs compared to many EU countries. A widely held view is that these features provide

little incentive for firms to train workers or participate in apprenticeship schemes, and are not conducive to capital-deepening investments. There is controversy as to whether or not the use of migrant labour in a relatively deregulated labour market has contributed to productivity (Portes, 2018; Oulton 2019).

Lacking from much of the policy debate is an understanding of how skills are moulded and deployed within the rapidly changing world of work, particularly as businesses respond to new technologies and competitive pressures to innovate in their products and processes. Workforce skills constitute a fundamental productive asset for any organization and yet we know little about how skill use and skill strategy interact with technologies within the workplace to shape productivity, nor about which workers gain and lose in the process.

This suggests a research agenda looking at three key areas. First, the relationship between the UK's training system and required labour skills. Second, labour market policy and regulation, including worker rights, minimum wages, and international labour mobility. And third, the engagement of firms in developing on-the-job skills and new competencies for occupations at a task-based level. An important aspect of the firm-employee relationship is the relationship between productivity and well-being in the workplace (for example, through employee engagement). Well-being in the work place is an end in itself but can also be a means to higher productivity.

Knowledge Capital

The UK is thought to be good at pure re-

search and invention, but poor at commercializing the knowledge generated. This is an old and perhaps outdated stereotype, but there have been business and policy concerns that too many British tech firms are sold overseas rather than continue to grow the enterprise in the UK. At the same time, both private and public spending on R&D are low (Forth and Jones, 2020). There is relatively slow diffusion of new technologies – such as digital – into small- and medium-sized businesses (SMEs) (Jones, 2014; Jibril *et al.*, 2020).

These concerns create research and policy challenges at several levels. First, the institutional structure of research in the UK seems not to be conducive to securing the coordination necessary for success, particularly in high technology and high value-added areas. The many stages that are necessary to link scientific research to development and commercial application require coordination between numerous actors, in the public, academic, and private sectors and, it is hypothesized, the UK has a weak framework for securing this coordination.

Diffusion of new technologies is slow and absorptive capacity appears weak, particularly in SMEs, often important parts of supply chains. Non-market sectors such as health care, education and government, are also challenged in connecting innovation and productivity. What are the factors creating this problem, to what extent are they related to weak vocational training, and can targeted business innovation approaches be designed and implemented?

There are large gaps in the understanding and measurement of knowledge capital and other types of intangible capital, whose economic properties differ from

those of tangible assets (Haskel and Westlake, 2018). Much work remains to be done in exploring the definition, measurement, and valuation of components of knowledge capital, as well as the interactions between intangible assets and organizational, human and social capital (Servaes and Tamayo, 2017).

Organizational Capital

The UK has a distinctive business demography compared to European comparator countries. It has a small manufacturing sector accounting for less than 9 per cent of employment and containing relatively few internationally competitive firms. It is well represented in financial, legal and business services, creative sectors and education with the service sector accounting for 47 per cent of exports (Department for International Trade, 2020). It also has a relatively large personal services sector, including many small enterprises in accommodation, entertainment and catering. Relative to similar countries, there are few mid-sized companies, and there is a high turnover of firms with high average birth and death rates (Besley and Davies, 2019). Despite this turnover, there is a long tail of low-productivity firms (Haldane, 2018).

There are a number of broad challenges for research. The first surrounds the potential role of an industrial strategy in developing internationally competitive firms and clusters of strength in manufacturing and in knowledge-intensive high value-added areas. This is particularly so as the UK seeks to develop an activist industrial strategy after four decades of eschewing such policies. Another is to work with firms and fine granular data to identify the obsta-

cles to raising productivity in SMEs, and to design practical ways of raising performance. Are there significant barriers to entry, and perhaps more importantly, to the growth of firms from small to medium size? Is corporate governance conducive to such growth, or biased towards short-termism and against long-run firm strategy?

A further area relates to trade policy, particularly Brexit and the UK's evolving pattern of international trade agreements. These will change market conditions, will likely lead to changes in supply chains, and may have important implications for foreign direct investment. FDI has been important to the UK and is associated with higher productivity, both in the investing firm and through spillovers to other firms (Javorcik, 2004; ONS, 2017). Much of this is "export platform" FDI, intended to supply both the UK and the wider European market. It will be important to track the shocks that firms face and their responses to them, following Brexit as well as COVID-19.

Geography and Place

UK productivity varies widely across regions (Zymek and Jones, 2020; McCann and Vorley, 2020; Haldane, 2018). These variations are large by international standards and, as well as dragging down measures of national productivity, create pockets of severe deprivation, social discontent, and political division. Some of the historical origins of this go back a very long way, others occurred during the upheavals and de-industrialization that took place in the 1970s and 1980s. The textbook economic adjustment mechanisms in response to negative regional shocks are out-migration of

workers, and inwards movement of replacement investment and jobs. These operated to a limited and imperfect extent, leaving many places in a low-level trap.

There are several aspects to understanding this. On the jobs side, we need to understand the location decisions of firms and the role of different factors – input costs, market access, skill availability, business ecosystem, etc. – in shaping location choices. What sort of jobs replace those that are lost following a negative shock? What are the local multipliers associated with different activities that may create spillovers and value for the region as a whole? The social and economic impact typically involves multiple mutually reinforcing processes, both economic and social. These include a low labour force participation rate, loss of skills, lower land and house prices, reduced building and infrastructure maintenance, and possible loss of tax base and deterioration of public services. The social implications of these changes transmit through several generations with devastating effects for attainment and for well-being.

Understanding regional productivity differentials raises numerous other questions. To what extent are measured productivity differences to do with physical productivity, or with regional variations in prices of non-traded outputs? The answer matters greatly for the design of policy. Why does the positive relationship between city size and productivity that holds in most countries break down in the UK? What does it take to detach firms from an existing cluster, and what are the costs, as well as the benefits of so doing?

Negative place-specific shocks have had

persistent effects despite substantial policy interventions. There are lessons to be learned concerning the effectiveness of local economic development strategies, infrastructure investment, land-use and housing policy, educational and social interventions, and perhaps above all, the interactions between these different interventions. The institutional framework is critical, with the hypothesis that UK structures inhibit local initiative. Government is highly-centralized, as are private sector services such as banking, while local business networks are in many places weak and do not provide an effective voice for job creation.

Macroeconomic Policies and Trends

While, as described above, underinvestment in the three capital assets and the highly unequal distribution of those assets across regions and devolved nations are at the core of the UK productivity puzzle, the macroeconomic context is key to providing a supportive business and financial environment. This is, and will be, particularly true as we seek to understand the economic shock created by COVID-19 and formulate effective policies to restore economic growth and foster productivity.

The wider macro-economic research agenda will look at both private and public finance. From a private finance viewpoint, a large financing gap for business has emerged due to, amongst other things, credit shortages in the post-financial crisis period as banking restrictions on lending lead to shortfalls in productive investment (Chadha, 2017). Such frictions may have interacted with monetary policies to build up a mass of relatively unproductive firms,

many carrying historic debt that impedes future investment.

From a fiscal viewpoint, public investment in productivity enhancing infrastructure may be limited by the fiscal regime and accounting frameworks used by the Treasury, as well as by the decade of ‘austerity’ following the financial crisis. The politicization of public expenditure may also work against long-term planning. A longer run policy framework, as well as the development of institutional capability is the key to unlocking better growth prospects.

Governance and Institutions

There are multiple aspects of the UK productivity puzzle that are deeply rooted in the underlying features and functioning of UK institutions and governance. There is a view that much decision making is too centralized spatially, and at the same time too fragmented functionally. Incentives of both politicians and officials are at times misaligned and inappropriate. And while some aspects of the regulatory system have evolved rapidly (e.g. in finance), others are ossified (e.g. land-use planning).

The geographical concentration of power in Whitehall and Westminster may stifle local initiative and pay insufficient attention to local circumstances. While there are moves to devolve power in the UK, there is a tension between devolution and the capacity of local areas to make and implement decisions, as well as questions about the shifting of power and resources. Identifying the appropriate spatial level requires understanding the complementarities between investments in human, knowledge, and organizational capital, and the best ways of supporting collaboration be-

tween local business, government and the educational sector. Institutions and governance arrangements are key to all these issues (Acemoglu and Robinson, 2012).

A common theme in much of the above is the failure to recognize, or internalize in decision making, the non-market interactions between those making the decisions and those affected by them (Rajan, 2019; Coyle, 2020). These interactions are essentially externalities, but in a much wider sense than economists' traditional use of that term. For example, in making decisions, businesses need to take account of implications for their supply chain, customers, workers and the community in which they are located. Development of an energy strategy – particularly during a period transition – requires coordination between producers, suppliers of infrastructure, producers of energy-using goods, and final consumers.

Even at the level of central government, policies tend to be functionally fragmented. For example, transport infrastructure decisions are made on a project-by-project basis, often not coordinated with implications for housing or jobs in affected areas. Education and human capital policies are rarely cognisant of policy priorities across government departments and between regional or local policy entities. Policies for vocational education and training, higher education and schools are all developed and delivered in different ways.

These institutional issues apply not only to government, but also to private sector activities. Finance is the most obvious, in which decision making is concentrated in the South East of the country, and has become divorced from 'on the ground' lo-

cal information (Mayer *et al.*, 2018). Elite educational institutions and the best-paid jobs for graduates are similarly concentrated in the East and South East of the country. The task for both researchers and policymakers is to understand – taking into account particular circumstances – how policy can be coordinated in order to boost productivity, and what institutional reforms are necessary to support policy coordination.

Social, Environmental and Technological Transitions

Improving productivity may become even more challenging as the UK – like other advanced economies – needs to address major technological, societal and environmental transitions over the next decade (as well as nearer-term crises). While new technologies offer great potential for faster productivity growth, their slow and uneven adoption, as well as specific challenges such as cyber and data security, pose further productivity risks (Brynjolfsson *et al.*, 2019; Van Ark *et al.*, 2020).

From a productivity perspective, it is important to address the impacts of digital transitions on production, jobs and work: what are the productivity impacts across sectors, how is the quantity and quality of jobs affected, and how does the reskilling and training of employees interact with the absorptive capacity of firms for new technologies and innovations? Digital transformation also enables more efficient ICT-mediated business models in various sectors, including transport (smart mobility), energy and utilities (smart grids, IoT applications, etc.) and food and retailing (smart food labelling, online shopping, and

improved supply chain management).

Similarly, without co-ordinated activity the drive towards net-zero carbon emissions could be detrimental to productivity. At the positive end of the scale, green growth policies may contribute to shaping market frameworks and incentives such that net-zero carbon and high productivity are complementary. At the negative end, it appears that without significant interventions, low carbon technologies may raise cost and cause shifts to lower productive sectors and activities. There are key questions regarding the regulatory environment to induce productivity-enhancing investments. There are also important measurement issues related to the impact of “no-action” scenarios on productivity and economic welfare.

An ageing society, post-Brexit changes to trade networks and immigration, as well as growing inequality in people’s access to decent (and productive) work are among the other emerging threats. The long-run impact of COVID-19, on work habits, urban structure, supply chains, patterns of consumer expenditure, and on governments’ fiscal space remain to be seen.

Measurements and Methods

Innovation in measurement and methods will be at the core of our research, and is cutting across the themes discussed above. There are conceptual issues to do with what is measured and how productivity measures are interpreted. Some of these are long-standing issues to do with externalities and non-market activity. Others have been thrown into sharp relief by recent events, such as Brexit and COVID-19. If a firm changes its production methods

to increase resilience then (even absent any externalities or non-market effects) how do we value this change in its measured productivity?

There are measurement issues, notably to do with productivity in service sectors, with regional price and productivity differentials, with measurement of intangible inputs and environmental capital, and, above all knowledge. There are new techniques and data sources that can greatly increase research capacity. These include increasing availability of administrative data, and multiple sources of “big-data” at granular levels of spatial and transactional detail.

Contours of the Engagement and Implementation Agenda

There is no ‘silver bullet’ solution to the UK’s productivity puzzle. The Productivity Institute’s research priorities point at the need to remove the obstacles to chronic underinvestment, to tackle the fragmented decision making and lack of co-ordination of investments at all levels, and to reinvent the link between productivity, well-being and improved living standards. Productivity essentially arises from a combination of a mix of business innovation and management quality within firms, supply chains and eco-systems between firms, and an over-arching framework of institutions and governance structures, appropriately conditioned by local and regional economic and social conditions.

In the UK context, this means that the engagement and implementation activities of The Productivity Institute need a strong regional focus. The Institute will therefore establish eight Regional Productivity Forums that reach across the whole UK, in-

cluding the three devolved nations, to provide the route through which businesses, regional and local policy-makers and other stakeholders will engage in the work of the Institute.³ These will be run out of the participating universities in each of the regions or devolved nations, and will have three main objectives:

- To work with target users to scope their needs and challenges, identifying where The Productivity Institute can best add value, in support of the Institute's guidelines that the majority of its research activities and outputs will be developed in collaboration, and in some instances through co-production, with business and policy users.
- To help identify the key topics and issues that have important implications for regional productivity performance and where stakeholders can come together to debate the issues and identify solutions. This could include for example, economic recovery and growth plans, business support and innovation programmes, employment and skills programmes, social innovation programmes, or infrastructure and digital investment initiatives.
- To contribute to the setting of The Productivity Institute's overall research agenda and, where relevant, individual projects that have a regional component. This will include initiating regional innovation projects and

developing proposals for larger scale projects that will be taken forward through the Institute's research plans.

Insights from the Regional Productivity Forums will be documented and shared through The Productivity Institute's Productivity Laboratory which may also support or initiate benchmarking, surveys or RCTs (randomly controlled experiments) working with multiple Regional Productivity Forums.

By no means does the strong regional focus of the Institute's engagement programme mean there is no role for national policy initiatives that support productivity. The Productivity Institute will establish a National Productivity Council to develop and support the national debate on productivity. The Council's focus will be on promoting robust and consistent policies to address the UK's chronic productivity shortfall. It will operate as an academic forum consisting of researchers from a variety of disciplines to develop research-based policies, and establish and explain the policy implications of research produced by The Productivity Institute and elsewhere. It will also support the translation of the Institute's regionally based insights into nationally coherent, coordinated and long-term policy responses.

While the National Productivity Council is independent from government, it will intensively engage with government and other national bodies (such as Innovate UK, and the Industrial Strategy Commis-

³ The Regional Productivity Forums will include Scotland, Wales and Northern Ireland and five regions in England, including the East, the Northeast/Yorkshire & Humberside, the Northwest, the Midlands, and London and the South. The forums will be chaired by a regional business leader and supported by a Regional Forum lead from each of the partner institutions.

sion). In this respect, the Council can become the focal point for Whitehall initiatives related to productivity issues, including agenda setting, informing policy-makers about the policy implications of their plans, and responding to policy requests. The Council, which will be run with the National Institute of Economic and Social Research, will look to highlight regional, national and international best practice, and identify and test models of researcher and policy-maker interaction such as issue-based task forces used by the Australian and New Zealand Productivity Commissions.

Finally, The Productivity Institute aims to be an open and transparent organization and will invite participation from researchers from across the UK and internationally. It operates a Productivity Fellowship program to support the exchange of ideas and collaborative research and engagement activities. This programme supports cross-institutional and cross-thematic research through several schemes including Productivity-in-Practice Business and Research fellowships joining business people and academics on specific projects; Policy Fellowships in the National Productivity Council; and short Career Development Secondment Programmes for business people, policy-makers and academics.

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