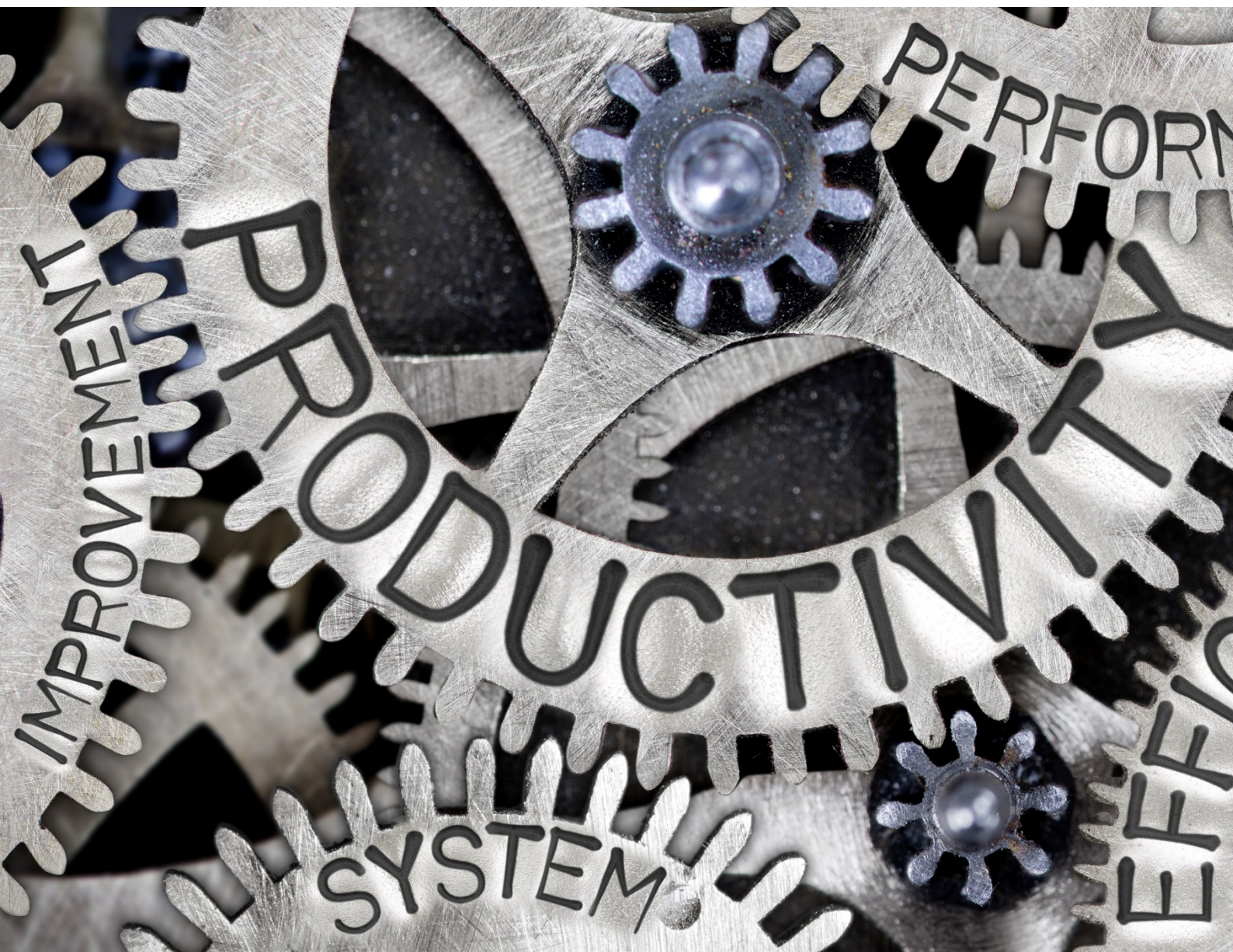


Productivity levers in London: A literature review to inform the Local Industrial Strategy evidence base

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## **Contents**

1	Introduction.....	2
2	The framework and approach for the rapid literature review .....	3
3	Key findings.....	5
4	Levers to support economic growth and productivity .....	7
5	Bibliography .....	24

# 1 Introduction

Productivity in its broadest sense can be defined as the efficiency with which production inputs (e.g. labour and capital) are being utilised to produce a given level of economic output. Increasing productivity is widely seen as a key enabler for improving living standards in the long term and as a necessary (but not in itself sufficient) condition for inclusive economic growth. It is therefore a key topic in any industrial strategy, including the Local Industrial Strategy (LIS) for London. This is particularly pertinent at a time when productivity in London has been growing at historically low rates, in line with the UK ‘productivity puzzle’ – the very slow growth in productivity since the financial crisis of 2008-09.

This paper summarises the findings of a rapid literature review on the effectiveness of policy levers to enhance productivity at a regional level, with a particular focus on levers which can be influenced by the public sector and on UK (and where possibly, London) evidence.

Section 2 of this paper provides an overview of the framework that the review has adopted to organise the discussion of productivity levers, enablers and of the cross-cutting driver of agglomeration economies, linking them to high-level factors affecting regional productivity as well as with the foundations of productivity in the UK Industrial Strategy White Paper. Section 3 summarises the key findings of the review, while Section 4 examines each lever by setting out the hypothesis on how it may affect productivity, a summary of key evidence and slightly expanded conclusions. A detailed bibliography completes the paper.

## 2 The framework and approach for the rapid literature review

In an OECD paper examining the structural determinants of regional productivity, Gal and Egeland (2018) identify Knowledge Base Capital (intangible assets), Physical Capital (investments by business and by the public sector) and Human Capital (education and skills) as the high-level factors that productivity levers can target and to which different levers and policies can ultimately be associated with.

This rapid review takes a strategic overview approach and focuses on higher-level 'levers' that can contribute to augment these stocks of capital as well as to facilitate economic and social conditions that increase productivity across all these forms of capital (the so-called multi-factor productivity). Levers are defined at a higher level than specific policies. For example, the review considers the evidence of the impacts of migration on productivity rather than the evidence on the implications of alternative migration regimes. At the same time, it not only looks at whether certain levers can affect productivity, but also at the extent to which those levers can be affected by public sector intervention to achieve the desired effects on productivity.

The levers themselves can also be broadly matched with four out of five foundations of productivity in the Industrial Strategy White Paper (BEIS, 2017): Business Environment; People; Infrastructure; and Ideas. For example, the levers of skills, labour migration and diversity all relate to the People foundation. The exception is Place, which is by definition a cross-cutting foundation and is reflected in the focus of this paper on effectiveness of regional levers. On the other hand, levers such as devolution and access to finance are cross-cutting 'enablers' that do not directly align with a specific productivity foundation.

The paper also includes evidence on agglomeration economies. While not a lever in themselves, agglomeration economies are typically identified as a key factor in boosting cities' productivity and as they are the result of different levers such as infrastructure, knowledge, skills, etc. combining at a specific location. Agglomeration is therefore included in the framework as a cross-cutting 'enhancer'.

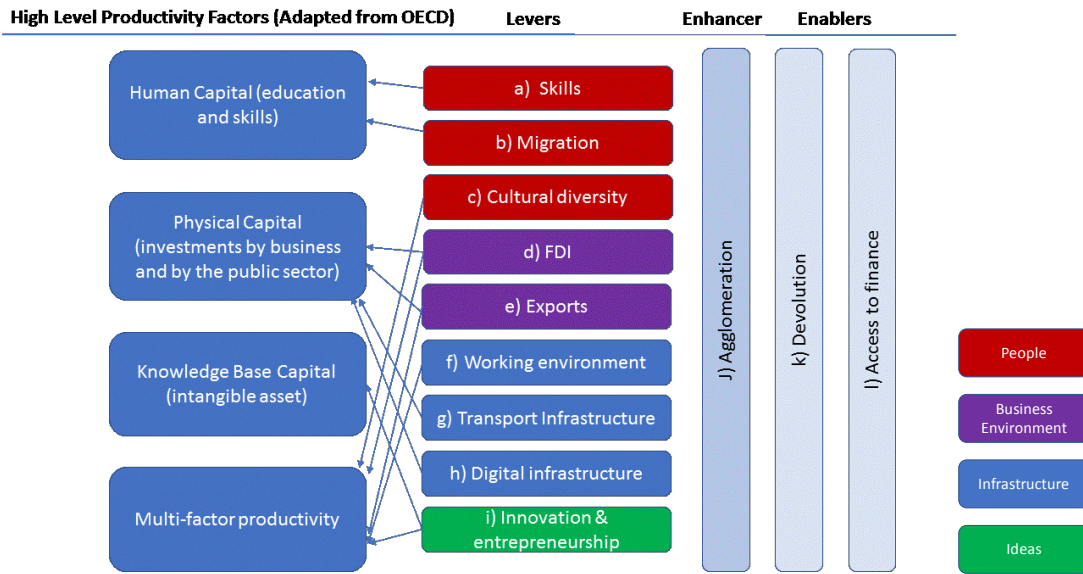
The focus on public sector levers means that the topic of business investment in physical capital (e.g. equipment, plant and machinery) is not specifically covered in this paper other than in terms of foreign direct investment and export (where we argue there is a role for the public sector), innovation diffusion and access to finance as a cross-cutting enabler. This is not to say that this is not a key driver of productivity at both a regional and national level. As we highlight in Chapter 2 of the LIS evidence base interim report, UK business investment in the UK and in London fell sharply during the recession and has stalled again recently, largely related to Brexit-related uncertainties, and it is thought to account for about half of the UK productivity puzzle.

Figure 1 summarises the framework that the rapid literature review has followed to organise the material and the relationship between high level productivity factors, levers and foundations of productivity.

Finally, in selecting literature on the various elements of the framework the review has prioritised evaluation evidence, including the high-quality evaluation evidence assessed by the What Work Centre for Local Economic Growth (WWCLEG) in their Evidence Reviews. Having said that the paper looks at a broader range of evidence, including for example government and independent reports, consultancy reports, literature reviews, economic statistics and business cases and appraisal evidence.



**Figure 1: The framework for the rapid literature review**



Source: GLA Economics

### 3 Key findings

The evidence of the impacts of the various levers on the UK & London economy differs considerably and hence consensus is not always clearly established. Where widespread consensus has been reached the availability of evidence is more widespread and more focused. With this in mind, the findings of the quick review for each lever (grouped by relevant foundation of productivity, agglomeration and enablers) are as follows:

#### People

- There is strong evidence linking increased **skills** and education to higher economic growth and productivity and it is widely accepted that investment in skills and human capital is a key driver of improved productivity at a city and national level.
- Overall, the balance of recent research indicates beneficial impacts of **migration** (especially high-skilled migration) on productivity in the UK, pointing towards higher labour resource utilisation and productivity gains. For a city like London, preserving the ability to attract talent from all over the world is likely to remain a key driver of productivity.
- Recent studies have found that **cultural diversity** being linked to improved economic outcomes, particularly in innovation and greater market access. This is an area that would deserve further UK-specific research but which is of particular interest for London.

#### Business Environment

- The impact of **foreign direct investment** (FDI) on productivity and growth is thought to be largely positive. Evidence on the impacts of investment promotion agencies in supporting FDI is still limited although recent evidence indicates that national and especially regional agencies can have positive impacts in attracting investment, particularly when following best practices.
- **Exporting activities** are also positively correlated with productivity at a firm and sectoral level and can be increased through export promotion and export credit agencies, although causality is likely to run both ways (i.e. more productive firms are more likely to export) and it is not clear that productivity gains persist in the long term.
- Several studies indicate that the **working environment** (defined as availability and quality of workspace and working conditions) has an impact on the productivity and growth of the local economy. Research on the impact of the physical and the social environment is more limited but also suggests positive links.

#### Infrastructure

- There is a well-established economic theory that points to **transport infrastructure** investments facilitating agglomeration effects and therefore leading to increases in local productivity, although the empirical levels on the strengths of these links is more mixed and suggests these are likely to be investment and location-specific. Historical evidence, business case evidence and the current and predicted severity of congestion on the London transport network suggest that transport investment in the capital will continue to be key to maintain agglomeration economies, manage congestion and other externalities and unlock new homes.
- There is broad consensus that **digital infrastructure** can play an important role in supporting city productivity. The presence of large gaps in the provision of advanced digital infrastructure in London and the presence of barriers and market failure limiting speed of take-up suggest that this is a promising area for public sector intervention

## Ideas

- Overall, the empirical literature confirms the insight from economic theory that **innovation and entrepreneurship** have a positive impact on productivity and economic growth. The evidence on the extent to which regional policies can positively affect innovation trajectories and boost productivity by promoting innovation and entrepreneurship is more mixed. Policy intervention is also regarded as necessary to support technology transitions and ensure inclusive innovation outcomes.

## Agglomeration

- Overall, the evidence suggests that strong and positive **agglomeration economies** operate to further enhance London's productivity, so preserving and enhancing these economies remains an important driver of productivity growth in the capital.

## Enablers

- Greater research is still required to fully understand the impacts of **devolution** (or decentralisation) on economic growth and productivity. In a UK context, the London Finance Commission, the OECD and a number of academics recognise this research deficit while also highlighting that the UK government is heavily centralised compared to its international peers. They therefore maintain that fiscal decentralisation will lead to greater effectiveness in local and regional governments in supporting growth, as well as having positive impacts on accountability, business mobility, resilience, fairness and efficiency.
- While in London tech businesses have a clear advantage in terms of **access to finance** compared to businesses in the rest of the UK, data from the UK Innovation Survey still point to finance being one of the most common barriers to innovation investment in London. Direct and indirect access to finance measures are widespread, although there is a lack of robust evaluation of their impact on performance outcomes such as firm productivity.

Finally, although this is outside of the scope of this paper it is worth mentioning that uncertainty about the post-Brexit framework for Britain is a contextual factor that could have the sharpest impact on London's future economic prospects of any of the levers in isolation, while potentially significantly affecting a number of them (e.g., migration and investment). Most published research suggests depressed growth and productivity, albeit with different views about London's relative resilience.



## 4 Levers to support economic growth and productivity

### 4.1 Skills (People)

#### Hypothesis

*Employment training seeks to raise productivity through improving worker skills. It can be achieved through training programs, apprenticeships, internships, career guidance and accredited qualifications. This increases human capital formation, enhances positive spill over effects on the productivity of other workers as well as driving innovation and investment (Leitch, 2006).*

#### Evidence

There is a vast international literature on the returns to investment in education and on the impacts of skills on productivity. In the UK, the Department for Business, Energy, and Industrial Strategy (BEIS) and its predecessors have done substantial research in recent years on the impacts of skills on productivity:

- BIS (2013) estimated that at least one-third of the 34% increase in labour productivity in the UK between 1994 and 2005 was due to the accumulation of graduate skills in the workforce. They also found that a 1% increase in the share of the workforce with a university degree raises the level of long-run productivity by 0.2-0.5%.
- BIS (2015) calculated that 20% of overall labour productivity growth in the UK in the run-up to the recession (between 2002 and 2007) was due to an increase in the level of skills. The high-skilled group accounted for the largest contribution. They also found growth would have been significantly lower in the aftermath of the recession had it not been for improvements in labour composition.
- BIS (2015) found that having a higher proportion of higher-skilled employees is associated with higher productivity outcomes. It found that at an industry level, raising overall training intensity by 1 percentage point raises productivity by about 0.74%. A caveat to this finding is that employer-provided training is typically undertaken by more highly-skilled workers, with less focus on improving training for lower-skilled workers.
- The UK Innovation Survey 2017 (BEIS, 2018) also found a correlation between the innovativeness of firms and the level of education of their staff. Amongst innovative businesses, 14% of employees had a science or engineering qualification while 17% had a qualification in a non-science subject. The corresponding figures for non-innovators were 5% and 10% respectively.

There is also a broader body of academic and other research looking specifically at the impacts of skills provision in the UK:

- The What Works Centre for Local Economic Growth (WWCLEG, 2015c) found some evidence that apprentices experience higher productivity; however, more impact evaluations are required. Similarly, employment training was found to have a positive impact on participants' earnings, indicating productivity gains (WWCLEG, 2016a). This was most relevant for shorter programmes (less than six months) and on-the job training, as opposed to classroom training.
- Using wages as a proxy for productivity, Dorsett, Lui & Weale (2010, 2011) found evidence that when an individual acquires a higher educational qualification after the age of 25 it raises an individual's wage by 9% for men and 18% for women.
- Dearden, Reed and Van Reenen (2005) calculated that an increase in the proportion of trained employees by one percentage point improves productivity by 0.6%.
- Mason et al. (2014) found considerable evidence of a positive relationship between upper-immediate vocational skills and relative labour productivity performance. This relationship is strengthened when vocational skills include uncertified skills acquired through employer-provided training. Additionally, positive impacts are experienced when high-level academic skills and lower-intermediate general skills

are combined with ICT. This suggests that to increase the returns to ICT investments it is necessary to invest in additional assets such as a highly-qualified workforce.

- Examining management practices and their impacts, Bloom et al. (2017) found that UK firms are on average worse managed than those in the US and Germany. Further, the authors calculated that around 55% of the total factor productivity gap between the UK and the US is due to substandard oversight by managers.
- Recent management practices and productivity analysis by the ONS (2019) found that there is a statistically significant correlation between management practices and labour productivity, with an increase in management score of 0.1 associated with a 9.6% increase in productivity.
- In a recent evidence review for the Productivity Insights Network, Abreu (2018) noted that in the context of a very extensive micro and macro literature on returns to education there are some remaining gaps in our understanding of the relationship between levels of skills and productivity performance, specifically in relation to UK regional disparities in educational outcomes and skills.
- Specifically, Abreu highlighted that there remain gaps in measurement of training; that the causes and effects of variations in non-cognitive (e.g. softer, interpersonal) skills are not well understood; several areas relating to adult skills are under-researched (especially in relation to older and self-employed workers); and that there is comparatively little research about how demand-side and supply-side of skills interact.

### Summary assessment

Overall, there is strong evidence linking increased skills and education to higher economic growth and productivity and it is widely accepted that investment in skills and human capital is a key driver of improved productivity at a city and national level.

Some gaps in our knowledge in terms of skills policy development have been highlighted in a recent review by Abreu (2018). There remain gaps in the measurement of training; causes and effects of variations in non-cognitive skills are not well understood; several areas relating to adult skills are under-researched (e.g., older and self-employed workers); and there is comparatively little research about the demand-side for skills.

## 4.2 Labour Migration (People)

### Hypothesis

*Labour migration may promote productivity gains in several ways. This includes: within-firm complementarities where immigrants increase the productivity of natives in the same firm; within-sector spillovers because of economies of scale, clustering impacts and/or increased income; geographical impacts; and incentive effects and investment.*

### Evidence:

Several studies have looked at the overall impact of UK migrations on productivity:

- Rocks (2018) found that EEA workers make an especially pronounced contribution to the London economy. The number of jobs held by EEA workers in London has increased significantly since 2004 with almost one-third of all EEA workers based in the capital. EEA workers tend to be younger and better qualified compared to those born in the UK or non-EEA countries. In London, they make a particularly strong contribution in construction, accommodation and food services sectors.
- Analysing the UK services sector, Ottaviano, Peri and Wright (2018) found that a 1% increase in immigration in the firm's locality is linked to improvements in firm labour productivity.

- Using the same sources, Rolfe et al. (2013) found that higher labour productivity is linked to immigrant share. The authors use substantial qualitative evidence to analyse the complementarity relationship between domestic and foreign workers as well as the existence of migrants' positive impacts on the skills shortage.
- Campo, Forte & Portes (2018) recognise the difficulties of identifying the economic impact of migration as levels of migrant workers can interact with other drivers of productivity (e.g., prevalence of international firms, which also tend to have greater worker diversity). However, they suggest that the overall impact of immigration on productivity is "positive, substantial and significant". They argue that the positive impacts are driven largely by immigrants with higher skill levels (measured by their level of education or occupation).
- Overall, the Migration Advisory Committee (MAC, 2018) found that "immigration has a positive impact on productivity, but the results are subject to significant uncertainty". They suggested that high-skilled immigration makes a positive contribution to innovation and training. Analysing training, they found no evidence that migration has reduced the training of UK-born workers.

It is worth noting that in the debate about the UK's productivity puzzle, migration of low-skilled workers (especially from EU countries) has sometimes been identified as one of the factors explaining slow productivity growth since the recession. This is based on the observation that low-paying industries with relatively low levels of productivity — e.g., accommodation and food, leisure and cleaning — were able to grow taking advantage of a plentiful supply of willing labour, with repercussions on average wages and productivity in the economy<sup>1</sup>. This, on the other hand, does not seem to be supported by econometric analyses, with Campo, Forte and Portes (2018) concluding that "Fears that immigration is responsible, in whole or in part, for the UK's dismal productivity performance appear unfounded".

Analysing training and complementary labour force impacts, the following UK and OECD evidence is available:

- If migrant skills are complementary to other factors of production, Boubtane, Dumont and Rault (2016) found that the relatively high skill levels of migrants contribute noticeably to greater economic output. They found that in the OECD, yearly GDP per worker increases by 0.32% in the short term and 2.23% in the long term in response to a short-term increase of 50% in net migration (as a proportion of working-age population).
- Geay, McNally and Telhaj (2013) found slight positive spillover impacts from non-native English speakers on school performance among natives.
- George et al. (2012) found evidence of complementarities between high-skilled immigrants and domestic workers, with no supporting evidence indicating reduced training outcomes for natives from immigration.
- Campo, Forte & Portes (2018) suggest that higher-skilled and better-educated migrants may be linked to increases in native workers' training. For example, an increase in more educated immigrants is associated with a 0.4 percentage point increase in training for native workers.
- Additionally, their results show consistently positive and generally (but not always) significant impacts of migration on the training of native workers. For example, at a local authority level a 1 percentage point increase in the migrant share is associated with a 10.1 percentage point increase in native workers' training.
- The MAC (2018) suggested that high-skilled immigration makes a positive contribution to innovation and training. Analysing training, they found no evidence that migration has reduced the training of UK-born workers.

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<sup>1</sup> See for example Holman and Pike (2016)

### The Migration Advisory Committee report on EEA migration

In September 2018, the Migrant Advisory Committee (MAC) published their evidence base, detailing the impacts of EEA migration. It discusses a wide range of impacts including wages, unemployment, productivity, training, consumer prices, house prices, public finances, allocation of public resources, public services, crime and subjective well-being. This evidence base is being used to design a new migration system after the end of the implementation period of the UK's exit from the EU, currently scheduled for 1<sup>st</sup> of January 2021.

#### Summary assessment

Overall, the balance of recent research indicates beneficial impacts of migration on productivity in the UK, pointing towards higher labour resource utilisation and productivity gains. Most research specifically points towards positive impacts from high-skilled migration, with evidence indicating positive impacts on productivity and innovation in the receiving country. For a city like London, preserving the ability to attract talent from all over the world is likely to remain a key driver of productivity.

## 4.3 Cultural Diversity (People)

#### Hypothesis

*Increases in cultural diversity can drive economic development through production complementarities, knowledge spillovers, increased access to global markets and more conducive entrepreneurial conditions (Nathan & Lee, 2013). Additionally, diversity-performance impacts may be amplified in an urban context where populations are more diverse and firms benefit from agglomeration economies.*

#### Evidence

There is a small but interesting literature that has looked at the impacts of cultural diversity on productivity. A sample of studies from Europe and the UK include:

- In a study covering more than 500 regions in 7 European countries (including the UK) Boschma & Fritsch (2009) found that more open and tolerant cities and regions grow faster reflecting the attraction of both conventional human capital and a greater presence of the creative class. Additionally, more diverse skillsets aid skill development and foster knowledge spillovers.
- Examining London firms, Nathan & Lee (2013) reported “a small but significant diversity bonus across innovation, market orientation and entrepreneurship”. They found that a diverse management team is more likely to drive new product development and introduce major process innovations. Additionally, diversity-innovation impacts are felt in both knowledge-intensive and manufacturing industries. Migrant status also has robust associations with proactive entrepreneurial behaviour through the formation of firms and the capitalisation of new market opportunities.
- Both personality and cultural traits have been found by a number of studies to influence innovation, entrepreneurship and economic growth (Huggins and Thompson, 2016; Obschonka et al., 2015; Lee, 2016).

#### Summary assessment

Interconnected with migration, a small but growing body of research has emerged to reveal some evidence of positive links between cultural diversity and the economic factors of productivity, innovation and entrepreneurship. This is an area that deserves further UK-specific research and which is of particular interest for London.

## 4.4 Foreign Direct Investment (Business Environment)

### Hypothesis

*As well as increasing the level of capital, Foreign Direct Investment (FDI) triggers technology spillovers, assists human capital formation, enhances enterprise development, increases competition and contributes to international trade integration. The public sector (including regional governments) can therefore increase productivity by creating positive conditions for FDI and by proactively assisting would-be investors, reducing their barriers and information costs.*

### Evidence

There are several UK studies that have looked at the benefits of FDI:

- Graham and Krugman (1993), and Girma et al. (2001) showed that firms undertaking FDI tend to be more productive than domestic firms either through competitive pressures or demonstrative impacts.
- Barrell and Pain (1997) estimated that 30% of productivity growth in UK manufacturing between 1985 and 1995 occurred because of FDI.
- Analysis by the Department for International Trade (DIT, 2018) showed that a 1% increase in FDI leads on average to a 0.0407% increase in labour productivity. They found mixed impacts of FDI on R&D in the UK. For every £1 million of FDI, domestic firms increase R&D expenditure by approximately £1,700 on average.
- Analysis by the DIT (2018) also calculated that the indirect effects of FDI in Great Britain leads to a net creation of GVA of around £69,000 for every £1 million of FDI.
- Over the last 10 years, the UK has attracted one in four FDI projects in Europe representing 34% of total European capital expenditure. London was the greatest recipient of global FDI by number of projects over this time recording double the number of FDI of the next city, Paris (London & Partners, 2017).
- Examining the wider UK impact from London FDI from 2003 to 2015, London & Partners (2017) found that 12.1% of FDI projects in the UK resulted from an investment in London contributing £7.6 billion to the UK economy and creating 38,000 jobs. The largest impacts were felt in Hotels & Tourism, Textiles and Financial Services sectors.
- The ONS (2019) found that foreign-owned businesses were around 18% more productive than equivalent, domestically-owned businesses, on average between 2006 and 2017. In explaining this they assume that foreign-owned businesses may have access to cheaper inputs, more structured management practices or access to more advanced technologies or processes, which allow them to be more productive.
- On the other hand, a recent evidence review by Harris (2018) for the Productivity Insights Network highlighted the limitations of available studies on the causal links of productivity spillover benefits for pre-existing UK firms. These are due to the lack of primary data identifying the nature of interactions between domestic and foreign-owned firms, and therefore the nature and strengths of potential spillovers.

Despite the proliferation of Investment Promotion Agencies (IPAs), sound evidence on their effectiveness is still limited (Harding & Javorcik 2012). Some research from a U.K context includes:

- Based on a review of high-quality evaluation evidence, the WWLEG (2017a) found that that IPAs may increase FDI inflows although in some cases support provided through IPAs has no effect.
- Crescenzi, Di Cataldo & Giua (2018) found that both regional and national IPA strategies are effective in attracting more FDI in targeted sectors, as well as non-targeted region-sectors. Additionally, evidence suggests that selective interventions targeting specific sectors are more effective, rather than broader IPA support.

- More recently, the same authors appear to have reached a more positive conclusion on the effectiveness of regional promotional agencies (where the evidence seems clearer compared to national agencies). They conclude that these agencies work regardless of the characteristics of the region in which they are located in terms of bringing more foreign companies, more investment and more local jobs, especially when they target key sectors of the local economy<sup>2</sup>.
- The World Bank (2018) found a strong and significant correlation between quality of promotion activities and FDI inflows. Using this comparison, the World Bank finds that Great Britain registers in the top echelon of 156 countries. Additionally, the organisation finds that the traits of more successful IPAs include those who target competitive markets, actively generate public attention, provide investors services and take an active role in advocating for policy reform.

### Summary assessment

Increasing FDI can have a beneficial effect on an economy's GVA and productivity. Evidence of the impact of Investment Promotion Agencies (IPAs) is still thin but recent evidence indicates that national and especially regional IPAs have positive impacts in attracting FDI, particularly when following best practices and targeting specific sectors. This is consistent with evaluation evidence of the impacts of London's own promotional agency London & Partners.

## 4.5 Exports (Business Environment)

### Hypothesis

*Engagement in export activities is thought to help improve productivity of exporting businesses through economies of scale, learning and competition effects. The public sector (including regional governments) can therefore increase productivity by providing support to firms that want to engage in export activities for the first-time, reducing the barriers, information asymmetries and risks that they face.*

### Evidence

There is a broad international literature that has looked at the potential impacts on productivity of starting to engage in exporting activities. Examples include the following:

- Wagner (2007) undertook a review of 54 microeconomic studies with data from 34 countries that were published between 1995 and 2006. The study found exporters to be more productive than non-exporters, although this was largely attributed to the more productive firms self-selecting into export markets rather than to a positive impact of exporting on firm productivity.
- Looking at UK data Greenaway and Kneller (2004) found evidence of self-selection, with larger and more productive firms entering export markets and having to increase their productivity in order to do so, but with no evidence of further productivity improvement after entry when using a matched sample. This led them to recommend that export promotion should focus on addressing information asymmetries and supporting the development of clusters instead of directly subsidising firms that self-select into exporting.
- In its Cities Outlook 2017 the Centre for Cities (2017) highlighted a link between exporting industries and productivity at the national level but went on to observe that the impact that exporting has on productivity at the city level is much less clear-cut and strong for services than for manufacturing. The proposed explanation was that a higher share of value added for the services sector is likely to accrue to the location from which export takes place. They therefore concluded that place-based export promotion policies should therefore consider the value added and not just the volume of exports.

<sup>2</sup> See: <https://blogs.lse.ac.uk/gild/2019/02/21/what-policies-work-for-fdi/>



- Recent analysis by the ONS (2018b) using a new dataset linking business-level financial data with administrative trade data found that companies reporting goods exports or imports are around 21% and 20% more productive respectively than businesses which do not trade (after controlling for size, industry and ownership status). It further found that among traders, more productive businesses export more products and import from more destinations than less productive traders.
- The effects estimated by the ONS appear to differ between the EU and non-EU markets: the productivity premia associated with trading with the latter appear to be considerably larger. This suggests a degree of self-selection whereby the exporters with relatively lower productivity find it easier to export to the EU.
- According to the evaluation evidence surveyed by the WWCLEG (2017b, 2017c), both Export Credit Agencies and Export Promotion agencies can have a positive impact on an economy's level of exports, although the former tend to represent a cheaper and more cost-effective form of support.

### Summary assessment

Exporting activities are positively correlated with productivity at a firm and sectoral level although self-selection effects (i.e. the fact that more productive firms are more likely to export) mean that causality is likely to run both ways and it is not clear that productivity gains associated with engaging in exporting activities continue in the long term.

The literature suggests that exporting activities can be increased through Export Promotion focussing on addressing asymmetric information issues and Export Credit Agencies (a particular form of support). This is once again consistent with the impact evaluation of London & Partner's activities.

## 4.6 Working Environment (Infrastructure)

### Hypothesis

*Higher cost of office space increases costs to business and curbs the impact of agglomeration economies. Additionally, the quality of working conditions which takes into account the environment, employee comfort and workplace design can be important determinants of productivity.*

### Evidence

There are several London and UK studies that have examined the impact of availability and quality of the working environment on productivity:

- Cheshire and Hilber (2008) examined the impact of planning regulations on the cost of office space. They found that from 1999–2005 the City of London had regulatory tax rates (the measure of the gross cost of land use regulations for occupiers of commercial property) of 4.31%, larger than most comparable European cities – Frankfurt (3.31%), Paris (3.75%) and Brussels (0.84%).
- Rogers (2017) found that as a place to live and work, London is faced with several challenges. Air quality regularly breaches EU targets, energy and water infrastructure is under stress and many people lack access to green space. London is also considered to be vulnerable to heat rises, more so than any other UK region.
- A trial study by Chadburn, Smith and Milan (2016) showed that personal productivity is dependent on the physical and the social/behavioural environment. It found that comfort, convenience, IT connectivity, good design and working to a specific time scale are strong drivers of personal productivity.
- Research by the Chartered Institute of Personnel and Development (2012) explored the benefits from flexible working. Key findings include:

- One-third of employees experienced less stress from flexible working
- 35% reported that it improved their productivity
- Employers view flexible working conditions as important drivers of employee engagement and well-being.
- The Confederation of British Industry (CBI) (cited in London Assembly, 2015) has claimed that 63% of employers believe that working flexibly has positive impacts on recruitment and retention.

### Summary assessment

Several studies indicate that the availability and quality of workspace and working conditions has an impact on the productivity and growth of the local economy. Research on the impact of the physical and the social environment is more limited but also suggests positive links. It is clear that London faces a number of challenges – from costs and availability of business space to poor air quality levels. The London Plan and other London policies like the Mayor’s Transport Strategy recognise and seek to address these challenges and could therefore help improve London’s productivity performance.

## 4.7 Transport Infrastructure (Infrastructure)

### Hypothesis

*Transport investment supports the economy through reducing transport costs and increasing accessibility for firms and businesses. For example, it improves a firm’s ability to provide goods and services, enables people to access education and employment as well as reducing travel times and vehicle operating costs. These objectives can be achieved by expanding or improving infrastructure, enhancing services or improving resource efficiencies.*

### Evidence

There is a well established economic theory that points to increased connectivity facilitating concentration of economic activity and ‘agglomeration effects’ (see section j below) , in turn leading to increases in local productivity.

- As explained in by Graham and Gibbons (2018), transport improvements reduce the costs of interaction, between workers, between workers and firms and between firms and consumers. In addition to these benefits (‘static agglomeration’), they can also lead to land use change and increased concentration of economic activities (‘dynamic agglomeration’).
- As part of their review of the impacts of transport infrastructure on economic performance for the Department for Transport (DfT), Venables, Laird & Overman (2014) also considered the relationship between transport and productivity. Overall, they concluded that the intense economic interactions fostered by transport links could increase productivity, both within narrowly defined areas and in terms of linking different areas. Additionally, they highlighted that these impacts are very location and project-specific.

Quantitative analyses of the strengths of this relationship in UK and international literature have tended to generate more mixed results:

- Gibbons et al. (2012) looked at the impacts of road improvements on firm-level employment and productivity using longitudinal data from Britain. They found that the construction or improvement to major roads over the period 1998 to 2007 has led to a 0.4% uplift in GVA per worker in the local areas affected (corresponding to an elasticity of 0.5 with respect to accessibility) as well as a 0.2% uplift in wages.

- Analysing business and trade volumes, Duranton, Morrow & Turner (2014) found that for every 1% reduction in travel distances between trading partners the value of trade increased 1.4% and the volume of trade increased 1.9%.
- The WWCLEG (2015b) concluded in a recent review of high-quality ex-post evaluations that there is limited and mixed evidence on the economic impacts of transport infrastructure. This points to the need to improve the quality of ex-post evaluation evidence in this area.
- Assessing the impact on economic growth of different types of road infrastructure in the regions of the European Union, Crescenzi and Rodriguez-Pose (2016) highlighted that quality of regional government can be a significant driver of differences in the economic returns from investment in secondary roads. Failure to take this factor into account could help explain why a number of academic studies have failed to find a strong relationship between economic growth and infrastructure. On the other hand, they also found that investment in motorways does not provide good returns even in regions with good governance.
- In a recent, large meta-analysis of studies of the relationship between infrastructure investment and economic growth, Holmgren and Merkel (2017) found a production elasticity range of -0.06 to 0.52. They also found that as the estimations of productivity enhancements due to infrastructure investments become more precise, they approach zero.
- Reviewing the literature (including several of the studies cited here) in a recent paper for the Productivity Insights Network, Docherty and Waite (2018) highlighted how the literature on the long-standing debate on the links between transport infrastructure and the economy once a mature transport system is in place remains inconclusive, with different studies reaching different conclusions.

There are a number of reasons that suggest that in London the relationship between investment in infrastructure, productivity and economic growth is particularly strong. Specifically:

- The economic history of London points to the importance of investment in radial transport connections to enable agglomeration effects and city growth. In a recent study, Hebllich et al. (2018) developed a quantitative urban model to assess the impact of steam railways on the growth of London between 1801 and 1921. They found that a counterfactual without the entire railway network would reduce total population and rateable value of Greater London in 1921 by 30% and 22% respectively. Finally, they noted that the introduction of agglomeration economies (which were enabled by the railways through separation of workplace and residence) would magnify these effects.
- London experiences higher congestion costs than anywhere else in the UK. London commuter zone drivers wasted an average of 96 hours in traffic during 2014, above the UK average of 30 hours. Londoners also spent more time idling in traffic than their European city counterparts. At the same time, the level of rail overcrowding in London (measured by percentage of Passengers in Excess Capacity) is almost three times the level experienced in other UK cities (Wingham, 2017a).
- More people and jobs in London mean that travel demand across all modes is expected to increase to around 32 million trips on an average day in 2041, five million more than today. Without adequate investments in transport infrastructure to boost capacity in London and in the Wider South East, congestion risks bringing the London network to a halt. In their Evidence Base for the Mayor's Transport Strategy, TfL (2017) highlighted the importance of future investment in London's transport infrastructure to unlock homes and jobs and to support agglomeration economies. Specifically, they highlighted how as a result of population growth and improved rail and bus services 7.6 million people will live within 45 minutes of central London, 2.3 million more than today.
- Several economic appraisals and evaluations of infrastructure investments in London and also suggest a positive and significant economic return. It should be noted these studies typically look beyond economic growth and productivity outcomes by including a broader range of social costs and benefits. For example:

- The Eddington Transport Study (2006) claimed that targeted new transport infrastructure in the UK can yield returns of £5-10 for every pound invested (this includes a high-share of non-business user benefits). Eddington argued that falling transport costs since 1960 have raised UK GDP by 2.5-4.4%. Eddington also cites the benefits of transport in supporting clusters and agglomeration of economic activity in large, high-productive urban areas of the UK. He cited London as the most significant example, arguing that some transport schemes induce a time savings benefit of over 30%.
- UCL (2014) examined the impacts of the Jubilee Line Extension completed in 1999. It was initially approved with a benefit cost ratio (BCR) of 0.95:1 based on the assumption that there existed significant unquantified benefits of site regenerations and jobs growth. More recent analysis shows that the JLE delivers a BCR of 1.75:1 despite experiencing cost over-runs.
- Buchanan (2018) reviewed the evolution of Crossrail appraisals since its inception in the 1970s. In 1996, London Transport and the DfT reported a BCR of 1.7:1 for Crossrail, citing good economic fundamentals, but significant construction cost risk. Additionally, the business case presented to parliament in 2003 showed a BCR of 1.99:1, revised down to 1.8:1 in 2004 due to project amendments.
- The latest business case summary (Crossrail, 2010) pointed to a BCR range of 1.87:1 to 2:55:1 depending of whether standard value of time savings or TfL (London-specific) values were used, although subsequent delays in opening and increase in costs are likely to have eroded these somewhat.

### Summary assessment

There is a well-established economic theory that points to connectivity facilitating agglomeration effects and therefore leading to increases in local productivity. At the same time, the strength of linkages between marginal transport infrastructure investments and economic performance has been the subject of a long-standing debate in the empirical literature and productivity effects are likely to be location and investment-specific.

Historical evidence, business case evidence (e.g. the impacts of major projects such as the Jubilee Line extension) and the current and predicted severity of congestion on the London transport network suggest that productivity impacts on London's transport network will continue to be particularly important to maintain agglomeration economies and manage congestion and other externalities. Transport infrastructure can also play a key role in addressing housing affordability (a key London concern) by unlocking land for development and increasing business and residential accessibility.

## 4.8 Digital Infrastructure (Infrastructure)

### Hypothesis

*Digital Infrastructure supports growth in productivity, efficiency and labour force participation. It enables new and more efficient business processes, greater access to new markets and supports flexible working arrangements.*

### Evidence

There is a body of recent UK and OECD evidence that has looked at the impacts of broadband and superfast broadband on productivity and which has found these to be significant and arguably large:

- The WWCLEG (2015a) found that broadband provision affects firm productivity and business activity at specific locations, however, these impacts are not always positive or necessarily large. Often, the impact is dependent on firms investing in complementary activities such as training.

- The Future Communications Challenge Group (2017) predicted that investment in 5G mobile networks in the UK enabled by core full fibre infrastructure will deliver £173bn in GDP growth between 2020 and 2030.
- The Department of Culture, Media and Sport (DCMS, 2018) found £690m in productivity gains from the Superfast Broadband programme. The study estimates that subsidised broadband coverage raise turnover per worker by 0.38%, equivalent to £1,390 in GVA per firm per annum.
- Koutroumpis (2018) estimated that new broadband services and technology has increased UK GDP by an average of 0.49% annually from 2002-2016. This growth was driven by improvements in broadband speed as well as greater levels of adoption. Examining OECD countries, the study finds higher levels of broadband adoption were witnessed in countries with higher levels of average education and R&D expenditure. Counter-intuitively, urbanisation has had a negative impact on broadband adoption.
- In another analysis of OECD countries, Strykowski (2012) found that a 10% increase in digital activity increases GDP growth from 0.2% to 1.6%.
- Docherty and Waite (2018) highlighted some methodological caveats to interpreting findings from the literature: measurement issues (where digital communications are difficult to measure per se and are typically proxied by digital capacity); rapidly changing nature of ICT use; questions about direction of causation between economic growth and digital activity; and the fact that adoption of new ICT can often happen alongside other organisational changes.

Nevertheless, the potential benefits associated with new digital infrastructure are often estimated to be large. Regeneris (2018) predicted that the total economic impact of deploying 'full fibre' broadband networks across 100 UK towns and cities could reach £120 billion over a 15-year period. This includes generating significant economic benefits for SMEs in terms of business productivity comprising of £2.3bn in innovation benefits; £2.3bn from new business start-ups and £1.9bn in flexible working benefits.

It is therefore a concern that penetration of the latest broadband and mobile technologies in London is relatively slow and patchy. Specifically, the London Assembly's Regeneration Committee (2017) has shown the extent to which London is lagging behind international competitors in terms of full fibre connections and is also lagging behind most UK cities in terms of 4G coverage (where it ranks in the bottom 5 UK cities with 73.6% of coverage) and high-speed broadband coverage (where it ranks 30th out of 63 cities across the UK).

Fibre To The Premises Broadband (FTTP) has clear natural monopoly characteristics. In theory, there should be incentives to invest for both new entrants (because they do not have a legacy network to defend) and for the incumbents (to protect their market shares). In practice, there are a number of sensible commercial considerations, regulatory incentives and barriers and other risks and uncertainties that can slow-down and limit the pace of investment – the so called 'hold-up problem'. This therefore points to a role for the public sector.

Frontier Economics (2018) compared and contrasted alternative policy scenarios against the current policy baseline: enhanced competition, national monopoly and regional franchises. They found that with the appropriate policy framework in place the percentage of premises in hold-up situations in the UK would reduce by a third, from around 15% to around 10%.

### Summary assessment

Overall the evidence suggests that digital infrastructure plays an important role in promoting places' growth and productivity. Combined with analysis that suggest that there are large gaps in coverage in the provision of advanced digital infrastructure in London and that there is a case for public sector intervention to provide the right incentives for investment, this suggests that digital infrastructure could be an important lever to

augment productivity in London. As noted, by the WWCLEG this impact is often dependent on complementary activities such as training, knowledge and capacity.

## 4.9 Innovation and Entrepreneurship (Ideas)

### Hypothesis

*Innovation involves the invention, diffusion and exploitation of new ideas. Governments can support innovation through funding universities, providing firms with fiscal incentives, or by providing R&D funding through grants, loans and subsidies. Entrepreneurs act upon opportunities which translates to new products and new markets, which in turn drives growth and productivity in the economy. They also are a key plank of knowledge spill overs, acting as a conduit between people and ideas.*

### Evidence

There is a long-established and well-developed literature that links innovation with economic growth. This includes several studies that have looked at the impacts of innovation on productivity in a UK context:

- Hall (2011) concluded from her review of 25 studies that there is a positive relationship between innovation and firm-level productivity, acknowledging the significant difficulties associated with measuring innovation.
- BIS (2011) found a strong correlation between product innovation and labour productivity. It calculates that a 1% increase in a firm's innovation sales per employee in the UK is linked to a 0.55% increase in productivity.
- Econometric analysis for the Greater Manchester Independent Prosperity Review (2019) found that doubling the proportion of science and technology jobs in a local economy – a proxy for innovation – could increase productivity by up to 4%.
- Dal Borgo et. al. (2013) estimated that intangible assets (e.g. software and databases, innovative property, economic competences or organisational assets such as brand names, firm-specific human capital and management capabilities) accounts for just under one quarter (23%) of UK productivity growth over the period 2000–2008.
- Similarly, Corrado et al. (2012) found that intangible assets accounts for 24% of UK productivity growth from 1995–2007.

A number of studies have also pointed out that innovative local economies tend to be characterised by high levels of entrepreneurship.

- Audretsch, Kelibach & Lehman (2006) found evidence suggesting that entrepreneurship tends to be spatially located within close geographic proximity to the source producing knowledge and ideas. Their overall assessment is that by facilitating knowledge spillovers entrepreneurship is the key factor that links generation of knowledge with economic growth.
- Huggins et al. (2014) found that highly productive economies are likely to be associated with efficient innovation systems and knowledge filters resulting from high levels of entrepreneurship.
- Econometric analysis of English firms by Crescenzi and Gagliardi (2018) found that firms' innovative performance strongly depends on their internal assets and potential absorptive capacity – the ability of firms to benefit from spillovers and use knowledge from the external environment to improve productivity – rather than by being located in areas characterised by high mobility of talent (a specific manifestation of agglomeration economies).



- Harris and Yan (2017) found that London exhibits greater ‘absorptive capacity’ than other regional centres, with firms’ greater absorptive capacity translating into higher likelihood that they may innovate, export and conduct research and development.
- By contrast, a report on technology diffusion among UK business by the CBI (2017) highlighted lack of leadership and a conservative and inward-looking attitude (‘sticking to what they know’) as factors that prevent too many UK businesses from adopting existing technologies and management practices that could considerably boost their productivity.

In terms of policy effectiveness (especially at a regional level):

- Brandenburg, Gunther and Schneider (2007) found that innovation performance at a firm level is enhanced by a combination of skills and R&D investment.
- Well-established institutions can contribute to innovation through a shrewd combination of incentives, constraints and financing. Analysing the European Union, Rodríguez-Pose and Di Cataldo (2015) argued that innovative capacity is related to the quality of institutions governing a region.
- In a systematic review of the literature of the innovation ecosystem for the Greater Manchester Independent Prosperity Review, Marzocchi et al. (2019) examined how regional policies can help promote innovation. They conclude that an approach that builds from existing strengths while also allowing both new specialisms and diversification to emerge could be the best way forward.
- A review of high-quality evaluation literature by the WWCLEG (2015d) found evidence that R&D grants, loans and subsidies can positively impact productivity, employment or firm performance (profit, sales or turnover), although some of the evidence suggest that support is more likely to increase employment than productivity. However, the WWCLEG caution on the role of local innovation policy. This reflects our limited knowledge of whether or how increased R&D activity feeds through to greater innovation and productivity.
- The WCCLEG (2016b) also reviewed the evaluation evidence on the impacts of various forms of business advice helping individuals to set up businesses and helping businesses to grow. They found that business advice had a positive impact on at least one business outcome in 14 out of the 23 high-quality evaluations they surveyed, although results tended to be better for sales than for employment and productivity.
- Looking beyond just productivity impacts, a recent forward-looking analysis, McKinsey (2019) argued that the development and adoption of smart automation and artificial intelligence has the potential to improve well-being in several ways (e.g. by increasing health, longevity and leisure time).
- McKinsey also pointed to the importance of appropriate policy frameworks in maximising the benefits of new technologies while managing the likely disruption during technological transitions. These can be negative for specific sectors and locations even if the overall impacts are significant and positive.
- Finally, skills levers (which have been discussed above) are also important for fostering innovation and managing technological transitions. As highlighted by BEIS (2011) there is no specific mix of skills that is conducive to innovation but rather a combination of scientific and technical skills, organisational and management skills and basic competence in language, sciences, maths and information technology among the general workforce to help workers adapt to change.

### Summary assessment

Overall, the empirical literature confirms the insight from economic theory that innovation and entrepreneurship have a positive impact on productivity and economic growth. The evidence on the extent to which regional policies can positively affect innovation trajectories and boost productivity by promoting innovation and entrepreneurship is more mixed. Appropriate policies are important to ensure that the benefits of new technologies such as AI are maximised while the disruption associated with technological transition are managed effectively. Local policies are also likely to be important to ensure that innovation outcomes are inclusive – the LIS Evidence Base interim report examines this issue in more detail.

## 4.10 Agglomeration Economies

### Hypothesis

*Agglomeration economies occur in cities or clusters of activity boosting the productivity of firms located within them. These positive spillovers are driven by key characteristics of cities including labour markets, finance and investments, physical infrastructure, housing, consumer amenities and social connectedness. Knowledge diffusion and innovation systems (the flow of technology and information among people and enterprises) are a major component of agglomeration benefits.*

### Evidence

Overall, there is strong evidence (including academic literature, consultancy reports and GLA studies) that illustrates agglomeration economies contributing to the exceptional level of productivity in London. For example:

- A study conducted by Volterra for GLA Economics (2006) found strong evidence of a positive non-linear relationship between earnings differentials and employment density indicating strong agglomeration impacts for London.
- Comparing London's high productivity to other UK regions, Overman, Gibbons and Tucci (2009) found that economic mass is clearly associated with higher productivity (even when accounting for differences in skills and transport accessibility between areas as well as for sectoral composition).
- GLA Economics' Economic Evidence Base for London (2016) highlighted the very high concentration of businesses in London's Central Activity Zone (CAZ) in spite of its high office costs as showing that businesses benefit from locating near to one another. Similar considerations also apply to a number of employment hubs in other parts of the capital.
- A Trends Business Research Ltd report (2016) undertaken during the production of the Economic Evidence Base for London also found that among the top ten co-locating sectors in London for 2013 there are a number of sectors where one would expect to see agglomeration economies at work, as firms benefit from labour market pooling and spillovers of ideas and innovation resulting from proximity (e.g., co-location of Information Service Activities with Activities of Head Offices & Management Consultancies). It also highlighted the role of urbanisation economies, where common infrastructure – such as property types – or a shared customer base drives co-location of firms with similar characteristics even if they are in different sectors (e.g. Retail Trade, Food & Beverage Services, and Other Personal Services).

Looking further afield, several other sources examine UK-wide evidence and include the following:

- The Manchester Independent Economic Review (2009) identified agglomeration economies as a key factor for understanding why firms in the Manchester region had higher productivity than firms elsewhere in the Northwest region. The same study did not find any strong evidence on the impact of industry clusters on productivity at the firm-level.
- Roberts and Setterfield (2010) analysed the diverging economic growth rates of UK regions. The authors argued that a region's growth rate is influenced by its ability to create conditions conducive to transmitting knowledge. For example, higher economic growth is realised through localisation benefits from spatial and economic diffusion of knowledge (Storper, 2009).
- These UK-wide findings are built upon by Sena & Higon (2014) who found that the impact of knowledge spillovers spreads beyond specific firms or industries. The study finds that the clustering of human capital facilitates the absorption of R&D spillovers. Additionally, they reported that the closer a firm is located to the technology frontier, the faster it absorbs R&D spillovers from other industries, with this leading to higher levels of productivity at the firm-level.

- In examining the wider economic impacts of agglomeration for transport appraisal, Graham and Gibbons (2018) observed that according to WebTAG estimates by Graham et al. (2009) service industries have a larger relative impact when compared to manufacturing industries, although the effects of agglomeration diminish more rapidly with distance for services. The finding that agglomeration effects are stronger for services is consistent with findings of a meta-analysis by Melo et al. (2009) which is summarised by Graham and Gibbons.
- The recent Greater Manchester Independent Prosperity Review (2019) examined recent evidence and concludes that the benefits of agglomeration are higher for higher-skills activities, while agglomeration effects are stronger in cities that have higher levels of skills.
- Martin et al. (2019) however challenged general conclusions about positive links between agglomeration and economic outcomes. They argued on the basis of long-term econometric analysis of economic performance that since the 1980s UK cities' size has no longer played a role in influencing their productivity growth, a key factor being instead the share of a city's employment in high skills occupations.
- Further, Martin et al. found that beyond London smaller and lower-density labour market areas in the south of England have grown skilled employment faster than larger and higher density areas. At the same time, they found that employment growth has been faster in both high and low-skill occupations in cities closer to London.
- Lastly, based on an econometric analysis of factors influencing British cities' resistance and recovery from four recessions (including the latest recession), Martin et al. also found that city size and agglomeration impacts no longer appear to influence city resilience (i.e. the ability of cities to absorb economic shocks and recover from them), although they found some evidence that distance from London may influence speed of recovery.

### Summary assessment

Overall, the balance of evidence suggests that strong and positive agglomeration economies operate for London. The extent to which links between scale and performance apply more generally to UK cities has been recently questioned by a number of researchers, with some evidence emphasising instead factors such as the share of high skills occupations in the local labour market, local hinterlands accessibility, links with other cities and connections with London. In any event, planning and infrastructure policies aimed at maintaining London's high level of agglomeration economies (in the CAZ and Northern Isle of Dogs, but also in town centres and other employment hubs) are likely to be important in supporting London's productivity.

## 4.11 Devolution (Enabler)

### Hypothesis

*By giving regional government authorities greater power over their tax base and public services the region's leaders will be more incentivised to develop their economy and seek opportunities to reform public services. In turn, this will have a positive impact on regional productivity and economic growth.*

### Evidence

- Bartolini et al. (2016) observed that devolution creates stronger incentives to subnational authorities to increase their tax base. It therefore incentivises them to create a better business environment and use their resources more efficiency, thereby enhancing regional growth.
- In its call to evidence, the majority of submissions to the London Finance Commission (LFC) (2017) cited the following benefits of increased devolution: greater adaptability of regional and local governments to

address challenges and opportunities; an increase in government accountability; a promotion in innovation of service delivery and; an enhancement of responsiveness to changing local conditions.

- In an empirical study looking across OECD countries, Blöchliger et al., (2013) found that decentralisation, as measured by revenue or spending shares, is positively associated with GDP per capita levels (with the result found to be stronger for revenue decentralisation than for spending decentralisation). They also found that decentralisation is strongly and positively associated with educational outcomes and with investment in physical and human capital.
- Martin et al. (2016) mentioned that while the international evidence on the impacts of devolution on regional growth is mixed and contingent to the specific governance arrangements, fiscal capacity and powers are seen as critically important. In this context, they remarked the outlier nature of the UK among most OECD countries in terms of the share of tax revenue accruing to local and regional government as a percentage of total tax revenue. This stood at 4.9% in 2012, compared to 13.2% in France, 35.8% in the US and 39.8% in Germany.
- As part of the LFC report, GLA Economics (Wingham, 2017b) conducted a literature review on fiscal decentralisation, and its impact on economic growth. Based on a small sample of published studies (including the study by Blöchliger et al. mentioned above), it found some studies linking economic growth and the subnational government's share of total government revenue. However, the GLA economics study find that there remained inconsistencies among the studies surveyed in the terms of the strength of the relationship. Some rudimentary correlation and econometric analysis for the UK was also inconclusive.
- In a study of regional productivity disparity in the UK, Gal and Egeland (2018) argued that greater devolution of responsibilities to UK regions could improve public sector efficiency in education and health care and could also have beneficial spillovers on business sector productivity through enhanced human capital.

### **The London Finance Commission report on fiscal devolution**

The LFC was recommissioned by the Mayor of London in 2016 to update their findings of 2013. At this time, it recommended the devolution of taxes and the control of resources to London, of which some progress has been made. In the subsequent report released in 2017, the Commission argues for "a more radical devolutionary settlement for London", creating greater incentives for economic development and opportunities for public services reform.

### **Summary assessment**

Greater research is still required to fully understand the impacts of devolution (or decentralisation) on economic growth and productivity. Methodological difficulties in isolating underlying factors and establishing causation have so far limited research in this area, although there is OECD evidence pointing to a positive relationship between decentralisation and productivity levers relating to human capital, such as educational attainment and skills.

In a UK context, the LFC, the OECD and a number of academics recognise this research deficit while also highlighting that the UK government is heavily centralised compared to its international peers. They maintain that fiscal decentralisation will lead to greater effectiveness in local and regional governments in supporting growth, as well as having positive impacts on accountability, business mobility, resilience, fairness and efficiency.

## 4.12 Access to finance (Enabler)

### Hypothesis

*Any kind of investment in productivity levers (whether in knowledge-based capital, human capital or physical capital) will typically require access to finance to meet the associated upfront costs. By addressing barriers to access to finance for local businesses governments can therefore promote local economic growth.*

### Evidence

In looking at this enabler two questions appear to be relevant. The first is whether there is evidence of financial barriers limiting investments that can support innovation and therefore productivity and especially (from a London perspective) the extent to which this applies to London businesses. The second is what we know about the effectiveness of policies that sought to address those barriers.

In terms of evidence of financial barriers:

- There is evidence that high-tech, innovative businesses in London benefit from locating in one of the world's leading financial centres in terms of access to loan and equity finance for innovation. According to London & Partners and PitchBook (2018), London's tech companies received £1.8 billion in venture capital funding in 2018, 72% of the total raised by UK tech firms.
- In calling for an increase in the supply of patient capital across the UK, The HM Treasury-commissioned Patient Capital Review (2017) also observes that the majority of existing capital is concentrated within London and the South East, while businesses in other regions are the ones that face greater difficulties in accessing this kind of capital.
- At the same time, there is evidence that in the years following the financial crisis the changing nature of the UK banking system has increased the barriers for business and for SMEs, in particular in terms of access to different kinds of finance (House of Commons, 2016). This has exacerbated pre-existing concerns about potential financial barriers to establish new business, grow existing business and undertake productivity-enhancing investments.
- On the other hand, Brown and Lee (2017) observed that since 2008 there has been significant changes to the market for small business funding which has led to increased levels of new entrants coupled with the emergence of alternative forms of small business lending such as peer-to-peer lending and crowdfunding.
- According to the UK Innovation Survey (2017) the most commonly reported barriers to innovation investment for both UK and London-based companies related to the financing of innovation. The direct cost of innovation was cited by 13.7% of UK companies and 11.9% of London companies as a barrier, 13.5% and 12.8% respectively cited the cost of finance, while 13.3% and 14.9% were concerned about the availability of finance.

In terms of policy evaluation evidence, the WWCLEG (2016c) found very few high-quality evaluation studies that examined the impact of access to finance scheme schemes on ultimate performance outcomes for firms, including productivity. As a result, they found it difficult to assess whether access to finance interventions improve the wider economic outcomes and point to the need for better evaluations in this area.

### Summary assessment

There is a case in principle that private funding for innovation activities that are high-risk and pay dividends in the long term may be sub-optimal from a social policy perspective. While London has a clear advantage compared to the rest of the UK (especially in terms of the ability of high-tech, innovative businesses to attract loan and equity finance for innovation), data from the UK Innovation Survey points to finance being one of the most common barriers to innovation investment in London. Direct and indirect access to finance measures are widespread, although there is a lack of robust evaluation of performance outcomes, including firm productivity.

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