

Productivity trends in London: An evidence review to inform the Local Industrial Strategy evidence base

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PRODUCTIVITY

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1 Introduction

'Productivity isn't everything, but, in the long run, it is almost everything.'
Paul Krugman (1997)¹

This report reviews the latest evidence to understand why labour productivity is so high in London overall and why its growth has stalled recently. This is a critical issue because, in the long-run, increasing productivity is crucial for economic growth and improving living standards. Boosting productivity growth is unsurprisingly at the centre of the Local Industrial Strategy (LIS) for London.

Background

In economic terms London is by far the most productive place in the UK, and among the most productive in Europe. Although there are disparities within London's sectors and between sub-regions, the capital's headline performance in terms of its overall *level* of economic output (GVA) per hour worked remains relatively strong.

But, despite its high aggregate level of productivity, labour productivity *growth* in London has been unusually weak in the aftermath of the 2007/08 financial crisis. While the capital recorded the highest rate of growth in GVA per hour worked of any UK region from 1998 to 2007, it had a far lower rate of growth in the period from 2010 to 2017. On this measure productivity is now 24% below where it would have been had pre-crisis trends continued. Median employee earnings have also declined recently, with the productivity slowdown cited as a major factor.²

Economists remain puzzled by these trends, with a range of theories put forward to explain them.³ This report draws attention to some of the factors most relevant for London, including: a sharp downturn in the financial sector and slowing exports; rising employment offset by falling capital investment; and uneven diffusion of ideas. None is sufficient on its own to fully explain what's happened, while the UK's decision to leave the European Union (EU) is a key source of uncertainty.⁴

This report addresses the following research questions:

- What determines the high overall *level* of productivity in London compared to other parts of the UK?
- What explains the sharp slowdown in productivity *growth* in London in the post-financial crisis period?

An accompanying GLA Economics briefing reviews the potential levers for enhancing productivity growth in London. Together these papers complement and inform the London LIS Evidence Base.

Structure

This report continues as follows. The next section provides a summary of some key findings. Section 3 explains what productivity is and how it's measured. Section 4 reviews the main evidence about the overall (high) level of productivity in London, also highlighting wide disparities between sectors and sub-regions. Section 5 looks at how trends have changed over time, drawing attention to the capital's unusually jobs-rich but productivity-poor economic recovery. Section 6 concludes by discussing the main factors for the recent slowdown in labour productivity, briefly assessing the plausibility of each.

¹ Krugman, P. (1997) *The Age of Diminished Expectations*, MIT Press.

² See, for example: ONS (2019) [Productivity economic commentary: January to March 2019](#)

³ See, for example: Office for Budget Responsibility (2017) [Economic and fiscal outlook - December 2012 \(Box 3.2\)](#)

⁴ There are wider issues, such as mismeasurement, this report does not review in detail. While there is no settled consensus on the 'mismeasurement hypothesis', the balance of recent research suggests it is not a leading factor in the recent productivity slowdown. For a useful discussion, see: Syverson, C. (2017) [Challenges to Mismeasurement Explanations for the US Productivity Slowdown](#)

2 Summary of key findings

- In economic terms London is by far the most productive place in the UK, and one of the most productive in Europe. Although the UK displays large regional disparities in productivity levels, this is partly driven by structural changes (e.g. the rise of a ‘knowledge-based’ economy) common to many advanced economies.
- Differences *within* industries are the main factor in explaining the capital’s strong overall productivity performance. London’s high level of aggregate productivity is not just about having more firms in certain industries; while the capital is relatively specialised in knowledge-intensive services, a productivity premium is evident across most sectors of the economy.
- At the same time, headline statistics mask significant disparities in performance across London. Despite strong aggregate productivity levels, there are both high and low productivity firms to be found in every sector in the capital, as well as significant spatial disparities. For example, labour productivity in Tower Hamlets is around 1.9 times higher than in Croydon.⁵
- Moreover, productivity *growth* in London has remained unusually weak in the aftermath of the 2007/08 financial crisis. Labour productivity (GVA per hour worked) is now about 24% below where it would have been had pre-crisis trends continued, with the capital recording the largest slowdown in annual productivity growth of any UK region or country since 2010.
- ‘Finance & insurance’ alone accounts for about a quarter of this fall in the productivity growth. Other previously high-performing and high-exporting sectors – including ‘Manufacturing’ and ‘Information & communication’ – also show sharp drops compared to pre-crisis growth rates.
- Sectoral shifts have made only a limited contribution to stalling productivity in the capital, with three-quarters of sector groups recording a lower rate of productivity growth in the post-crisis period. Several other factors are likely to have weakened productivity performance, including:
 - A slowdown in global trade activity – Office for National Statistics (ONS) estimates indicate that London had a lower rate of growth in service exports than most UK regions in the five years to 2016.
 - A backdrop of economic uncertainty and low wage growth – which seems to have encouraged investment in labour over capital, to the detriment of productivity growth.
 - Unequal diffusion of technology and working practices – Bank of England analysis points towards large disparities in productivity performance between frontier firms and the rest.

⁵ GVA per hour worked excluding rental income.

3 What is labour productivity?

Defining productivity

Productivity is about how efficiently a set of production inputs, such as labour or capital, are employed to produce a given level of economic output. Single-factor productivity measures are often used to give an input-output ratio.⁶ Thus, in most of what follows, ‘labour productivity’ is the main indicator presented – that is, the ratio of goods and services produced per unit of labour input:

$$\text{Labour Productivity} = \frac{\text{Economic output (GVA / GDP)}}{\text{Labour input (workers / jobs / hour worked)}}$$

There are several ways to measure these variables. In this report economic output is based on Gross Domestic Product (GDP) for international comparisons and Gross Valued Added (GVA) for regional analysis.⁷ The balanced GVA approach provides estimates in nominal and ‘real’ terms (chained volume measures, with the effect of inflation removed), with the latter useful for analysing trends over time.⁸ Labour input is based on the number of workers, jobs or hours worked. Where possible, GVA per hour worked is preferred since it most accurately accounts for variations in working patterns.

Variations in productivity

Changes in either output or inputs can impact productivity performance. For example, if economic output rises but the number of hours worked remains unchanged, then productivity will increase. But if economic output is fixed and the amount of labour used in the production process increases (e.g. hours worked goes up), the result would be a fall in labour productivity, since more labour was used to produce the same quantity of goods and services.⁹ In the past UK productivity growth has generally been pro-cyclical – tending to rise in periods of economic expansion and fall in recessions.¹⁰

How other factors of production are used or combined can also influence labour productivity levels. More intensive use of machinery or better technology can, for example, increase the amount of output produced for the same labour input. This means that two producers can have quite different levels of labour productivity if one happens to use capital inputs more efficiently than the other.¹¹ The quantity or quality of capital (e.g. ICT equipment) that employees work with is therefore an important matter, as is the quality of workplace management – points which are discussed further in Section 6.

Data uncertainty

This paper draws on a wide range of data produced by the ONS. However, constructing productivity measures isn’t without challenges. Issues can arise when it comes to estimating hours worked or economic output over time, as well as defining and measuring the economic performance of regions in a comparable way.¹² There are also concerns that standard measures of economic output – such as GDP and GVA – don’t account for unpaid work or fully capture the emergence of digital technologies. The analysis in this report is subject to these (and other) sources of uncertainty and should be treated with some caution.

⁶ Due to limited data availability at a sub-national level we do not focus on Total Factor Productivity, which controls for how different factors of production are used in the production process.

⁷ GVA is an estimate of the total amount of goods and services produced less the value of intermediate inputs. It is preferable to GDP at the regional level because it excludes taxes and subsidies on products that are difficult to attribute to local units.

⁸ Note: the balanced measure of regional GVA was recently granted National Statistics status. For more information see: ONS (2018) [Regional economic activity by gross value added \(balanced\), UK: 1998 to 2017](#)

⁹ House of Commons Library (2018) [Productivity in the UK](#)

¹⁰ Bhaumik, S (2011) [Productivity and the Economic Cycle](#). BIS Economics Paper No.12.

¹¹ Syverson, C. (2011) [What Determines Productivity?](#)

¹² There is a risk of comparing areas which are not alike; a lack of regional price levels can also amplify regional productivity disparities. For more information, see: OECD (2019) [Reducing regional disparities in productivity in the United Kingdom](#) (Box 1)

4 The level of productivity in London

This section compares productivity performance in London with the rest of the UK. It highlights the main factors for London’s relatively high level of aggregate productivity, before drawing attention to the wide disparities in productivity performance within the capital – both by sector and sub-region.

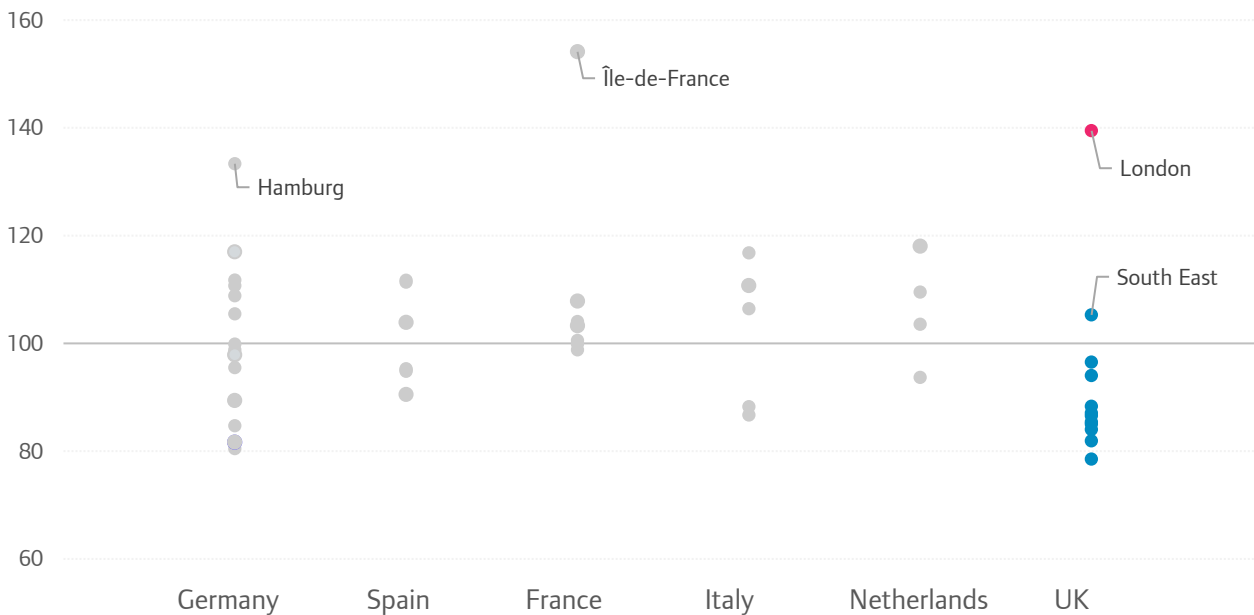
Unlike most parts of the UK, London is among the most productive regions in Europe

There is a long-running gap between the level of productivity in the UK and in many other advanced economies. Indeed, it has often been claimed that workers in Germany and France will ‘by the end of Thursday afternoon’ have produced what takes the UK worker an entire week.¹³ More recent OECD analysis suggests that measuring labour inputs in a more consistent way across countries would narrow this underperformance.¹⁴ Even then, the UK still trails its international peers in productivity terms.

London, on the other hand, is one of the most productive places in Europe. GVA per hour worked was one third above the UK average in 2017, with a relatively large gap to the rest of the country. This strong performance holds for different productivity measures and when accounting for firm characteristics.¹⁵ Looking more widely, as Figure 1 indicates, only Île-de-France (which includes the city of Paris) had a higher level of GDP per worker among 52 NUTS1 areas in Western Europe in 2014; whereas the South East was the only other UK region with a level of productivity above the UK average.¹⁶

Figure 1: London is one of the most productive place in Western Europe

GDP per worker by NUTS1 regions, UK and selected European countries, 2014 (Index UK=100)



Source: Office for National Statistics. Note: indexed data where the level of GDP per worker in the UK equals 100. Each marker represents one of 52 NUTS1 regions in Germany, Spain, France, Italy, the Netherlands and the UK.

Yet the UK is not alone in having a large disparity in productivity between leading regions. France, for example, also shows a large gap in GDP per worker between its capital and next highest-ranking NUTS1

¹³ See, for example: Full Fact (2015) [Are British workers less productive than Germans and French?](#)

¹⁴ OECD (2018) [International productivity gaps: Are labour input measures comparable?](#)

¹⁵ For example, London’s overall productivity advantage is only marginally reduced if imputed rental incomes are excluded from GVA. For more on firm characteristics, also see: ONS (2019) [Understanding spatial labour productivity in the UK](#)

¹⁶ This stands for Nomenclature of Territorial Units for Statistics. For more detail see Appendix B and [Eurostat](#).

area. These trends are likely to be influenced – in part – by structural changes common to many advanced economies; specifically, the economic benefits accruing to large cities linked to the rise of knowledge-based activities.¹⁷ The key issue is that other areas in France are clustered close to the UK average for GDP per worker, while several UK regions are among the least productive in Western Europe, alongside parts of southern Italy and eastern Germany.¹⁸

Of course the choice of geography also matters when making comparisons between places and London is not necessarily directly comparable to other UK regions (Box 1). That said, a broadly similar picture of spatial disparities persists if we focus on metropolitan areas alone (see Appendix A.1).

Box 1: Choosing comparable geographies to measure productivity

The guidance for NUTS1 areas suggests that, among other factors, they should follow a population range from 3 to 7 million people, making them broadly comparable in terms of population size. But NUTS1 areas can still differ in terms of other socio-economic characteristics and/or in terms of their economic functions. Recent work by the ONS, for example, highlights a large gap in productivity performance between urban and rural areas.¹⁹ Because London is more highly urbanised than other UK regions, this can make direct comparisons somewhat problematic.

It's also possible to base analysis of this kind on the OECD / Eurostat defined 'Metropolitan areas'. According to this definition an urban area is a functional economic unit characterised by a densely inhabited 'city core' and 'commuting zone' whose labour market is highly integrated with the core.²⁰ Using this data Appendix A.1 replicates Figure 1 for metropolitan areas for the same set of countries. It offers a broadly similar picture, albeit London ranks more closely with some other UK cities (mainly those in the South East of England). Note, however, these metropolitan geographies include commuting zones and can deviate from a local area's usual administrative boundaries.

Productivity differences *within* sectors explain London's advantage

What explains London's strong productivity performance? Variations in average labour productivity between places generally arise from differences in either the firm characteristics or industry composition of an area. As the ONS puts it:

- areas can have a different industry mix; and/or
- within the same industries, the firm productivities in one area can differ from those in the same industry in other areas.²¹

Table 1 sets out the contribution of each of these factors based on analysis undertaken by the ONS on the non-financial business economy. It shows that London's high level of productivity is less about having more firms in certain industries, although this plays a part too. Rather, it mainly reflects the fact that the average London firm displays a higher level of labour productivity than its counterparts elsewhere. In other words, firms in London outperform their peers *within* industries – and this is the main factor in explaining the

¹⁷ See, for example: OECD (2019) [Reducing regional disparities in productivity in the United Kingdom](#)

¹⁸ 8 of the UK's 12 regions are among the 14 lowest ranked regions alongside regions of eastern Germany and southern Italy.

¹⁹ ONS (2017) [Exploring labour productivity in rural and urban areas in Great Britain: 2014](#)

²⁰ For more information, see: <https://stats.oecd.org/Index.aspx?DataSetCode=CITIES>

²¹ ONS (2019) [Understanding spatial labour productivity in the UK](#)

capital's strong overall productivity performance.²² However, this analysis does not include the financial sector which could understate the industry effect in London.²³

Table 1: It's mainly differences within industries that explain London's aggregate productivity advantage

Sources of aggregate GVA per worker 2015 in Great Britain NUTS1 regions (Index, GB = 100)

	Aggregate Labour Productivity Index	Firm Productivity Index	Industry Composition Index
North East	85	85	99
North West	91	91	99
Yorkshire and The Humber	84	85	97
East Midlands	78	80	100
West Midlands	91	89	99
East of England	91	91	100
London	143	136	102
South East	107	105	101
South West	82	83	98
Wales	74	75	98
Scotland	99	93	103

Source: ONS Annual Business Survey. Notes: (i) analysis excludes the finance, agriculture and public sectors; (ii) the table has also left out the residual covariance index for readability.²⁴

In fact, the level of productivity in London is relatively high in most industry groups. This point can be seen more clearly in Figure 2. It compares firm-level GVA per worker in the non-financial business economy for London and Great Britain as a whole; indicating the median level of GVA per worker (the arrow), the interquartile range (bars) and the 10th and 90th deciles (lines). It indicates that:

- median GVA per worker is higher for London firms in all industries, with the exception of the 'Manufacturing' sector (as well as 'Mining & utilities' which is not shown below); although,
- median productivity gaps are especially marked in services sectors such as 'Professional, scientific & technical activities', 'Real estate' and 'Administrative & support services'.

So, while differences *within* sectors are generally more responsible for London's strong productivity performance, better productivity among service sector firms plays a particularly important role. Moreover,

²² Specifically, the table shows that in London's non-financial business economy:

- The 'Industry Composition Index' equals 102 (i.e. 2 percentage points above the GB average) – this is the productivity that would exist if we kept the London industry structure but applied Great Britain levels of productivity within industries.
- The 'Firm Productivity Index' equals 136 (i.e. 36 percentage points the GB average) – this is the productivity that would exist if London had a Great Britain industry structure whilst maintaining local industry productivities.

²³ This analysis only covers the non-financial business economy. It excludes the public sector as well as the agriculture and financial sectors of the economy, with the latter particularly relevant at the London-level. Other studies suggest a larger industry mix effect in the capital. See, for example: Beatty, C. & Fothergill, S. (2019) [Local Productivity: The real differences across UK cities and regions](#).

²⁴ ONS (2018) [Regional firm-level productivity analysis for the non-financial business economy, Great Britain: April 2018](#)

while London does have a high percentage of firms at the national productivity frontier²⁵, it's not simply that the capital is home to a small number of 'superstar firms', higher levels of productivity are also evident in typical (median) London firms. Several factors are likely to influence this finding, including the extent of local markets and propensity for international trade (see Box 2).

It's also important to note that productivity indicators depend on pricing.²⁶ The regional productivity analysis reported here is based on nominal GVA and does not take account of any regional price differences or different factor prices faced by firms. Higher income areas, such as London, tend to have higher prices which in turn leads to higher measured productivity. This is especially relevant to productivity in non-tradeable sectors (e.g. 'Other services') where goods and services are produced and consumed locally.²⁷

There is still a large proportion of London firms with low levels of productivity

But despite strong *average* productivity levels, there are still high and low productivity plants to be found in every sector. Looking at the distribution of firm-level productivity (Figure 2) more closely suggests that local plants at the 90th decile in terms of GVA per worker in London (i.e. the top 10% of local plants) are at least 2-3 times more productive than those at the 10th decile (the bottom 10%) in each industry group. In some cases, including in 'Administrative & support services' and 'Other services', the gap between the highest and lowest performing plants is even more pronounced.²⁸

²⁵ i.e. top 5% in terms of productivity, see: Kierzenkowski, R., P. Gal & G. Fulop (2017) [Where to get the best bang for the buck in the United Kingdom? Industrial strategy, investment and lagging regions](#). OECD Economics Department Working Papers, No. 1426.

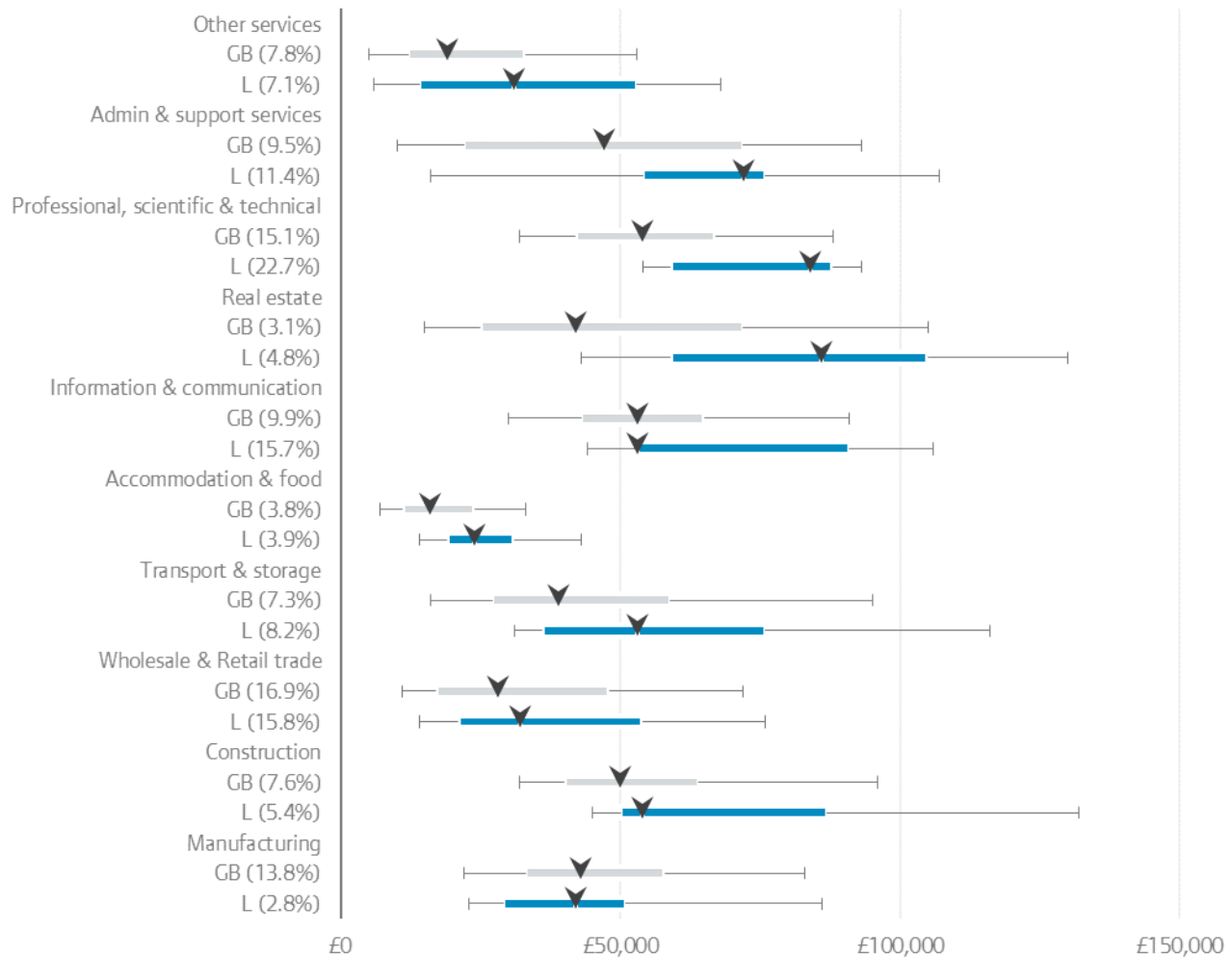
²⁶ ONS (2018) [Regional firm-level productivity analysis for the non-financial business economy, Great Britain: April 2018](#)

²⁷ Although, as the OECD points out, insofar as local price differences reflect strong market segmentation across regions, they 'induce similar policy challenges to those that aim to reduce productivity differences'. See: OECD (2019) [Reducing regional disparities in productivity in the United Kingdom](#)

²⁸ Note: this data is expressed in nominal terms, i.e. *without* controlling for the effects of price differences. The existence of firm heterogeneity within sectors is, however, widely cited in the economics literature; as Syverson summarises it: 'some producers seem to have figured out their businesses, while others are woefully lacking'. Source: Syverson, C. (2011) [What Determines Productivity?](#)

Figure 2: Median productivity levels within most industries are substantially higher for London firms compared to the Great Britain average, especially in services sectors

Distribution of local plant GVA per worker in selected industries, London and Great Britain, 2015.
Key: arrow (▼) = median; bars (■) = interquartile range; lines (|—|) = 10th and 90th deciles.

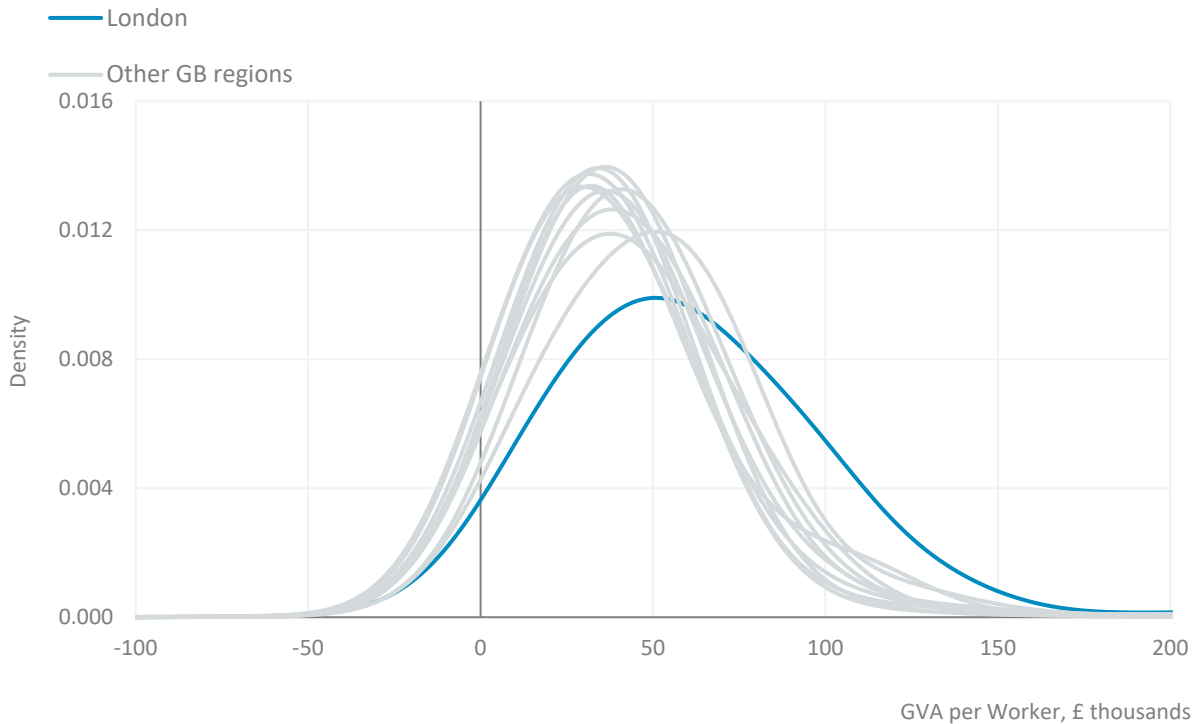


Source: ONS Annual Business Survey. Notes: (i) excludes the finance, agriculture and public sectors; (ii) each local plant is assigned to a single SIC 2007 group; (iii) 'Mining & utilities' has been left out of the chart for readability.

To further illustrate this point Figure 3 sets out the distribution of local plants across all sectors of the non-financial business economy by their level of GVA per worker in 2015. It reinforces the fact that London has a relatively large share of firms with higher levels of productivity – as indicated by the less skewed distribution compared to other regions. However, it also highlights the still substantial proportion of firms in London where productivity is clustered at lower (or negative) levels.

Figure 3: Every region has both high and low productivity plants, including London

Distribution of firm-level GVA per worker, Great Britain regions and countries, 2015



Source: ONS Annual Business Survey. Notes: (i) excludes finance, agriculture and the public sectors; (ii) Kernel Density, Bandwidth size equals 20; (iii) firms can have negative levels of GVA per worker when they report larger values of purchases than their total turnover.

Recent ONS analysis takes a closer look at the characteristics of firms in the bottom end of the labour productivity distribution for the non-financial business economy in 2015.²⁹ The results suggest that the vast majority of local units in the bottom fifth of London firms by productivity level are in less knowledge-intensive services (such as ‘Accommodation & food’ or ‘Wholesale & retail trade’).³⁰ Most of these firms are attached to micro enterprises (1 to 9 employees) and a high proportion are attached to younger (less than five years old) enterprises. However, there are also a large share of high productivity firms in these categories while less productive firms are disproportionately attached to enterprises that are larger (over 250 employees) and older (over 20 years old) (see Appendix A.2).

Still, some caution is needed in interpreting the latter results. For example, median GVA per worker also tends to rise with the size and age of firms in the capital, suggesting that very high productivity plants also exist within the top of the productivity distribution for these groups, possibly reflecting the benefits of economies of scale and scope.³¹ Nor are these characteristics unique to London; they appear to have only limited influence on the variations in overall productivity performance between regions.³²

²⁹ Source: ONS (2018) [Regional firm-level productivity analysis for the non-financial business economy, Great Britain: April 2018](#). More specifically, for London’s non-financial business economy, this work finds that:

- Most lower productivity firms are in less knowledge-intensive services. This broad group accounted for 91% of local units in the bottom fifth of firms by productivity level in 2015, double its share of the business population.
- Local plants associated with the largest enterprises (250+ employment) accounted for a disproportionate share of lower productivity firms, making-up 18% of firms in the bottom fifth of the distribution, despite accounting for just 7% of local units.
- One in three local plants in the bottom fifth of the productivity distribution were categorised in the older age group (20 years or older), despite making-up only a fifth of all firms.

³⁰ For more detailed information, please see the [Eurostat website](#).

³¹ ONS (2019) [Firm-level labour productivity measures from the Annual Business Survey, Great Britain: 2017](#)

³² ONS (2018) [Regional firm-level productivity analysis for the non-financial business economy, Great Britain: April 2018](#)

On the face of it, there should be scope to raise performance within less productive firms – by promoting wider adoption of high-performance working practices or take-up of ICT technologies, for example. Yet relative productivity performance between sectors has changed very little over time.³³ Spatial disparities in productivity levels among firms will also, to some extent, reflect the underlying supply and demand conditions that businesses encounter within different localities – including variations in spending power, accessibility (and quality) of transport links and so on. In some cases, the public sector’s ability to influence these can be ‘relatively constrained’ (see Box 2).³⁴

Box 2: Potential factors linked to higher productivity within London’s service economy

A range of factors have been associated with variations in productivity levels for firms in the same industries in different parts of the UK and London. The following draws attention to a few key factors based on work by the ONS and others. For a more detailed discussion, including on the role of public policy, see the accompanying [GLA Economics paper on productivity levers in London](#).

Internal factors are those which operate directly within the plant or firm: they are the ‘levers that management or others can potentially use to impact the productivity of their business’.³⁵ They include things like management practices, the adoption of ICT and other innovative technologies, ownership and firm structure as well as trading behaviour. London, for example, features a relatively high proportion of firms that trade internationally (Appendix A.3); this can enhance firm-level productivity through increased scale economies and integration into global supply chains. Exporting firms have, on average, levels of productivity around one-third higher than their non-exporting counterparts.³⁶

External factors relate to producers’ wider operating environment.³⁷ They tend to be more influenced by government policies but can be difficult to change in the short term. Examples include local labour market conditions, transport connections, levels of consumer spending and agglomeration economies – that is, the proximity of high-skilled workers and businesses which is a prominent feature of the London economy and is thought to foster productivity through specialisation and knowledge spillovers.³⁸ While the extent of agglomeration benefits (and costs) is disputed, there is empirical support that some productivity gains exist, especially in service sectors.³⁹

Several of these factors appear to be closely correlated with productivity performance (see Appendix A.3 to A.6). However, causal links are more difficult to identify, with causality often running in more than one direction. There is, for example, evidence that the self-selection of relatively productive plants into international markets is the main source of gains associated with exporting.⁴⁰ Similarly, more productive places are often able to attract skilled workers from elsewhere (given higher pay levels), rather than the productivity of that region being caused by, say, specific investments in the local skills system. However, this does not rule-out the existence of unproductive ‘market failures’.

³³ ONS (2019) [Firm-level labour productivity measures from the Annual Business Survey, Great Britain: 2017](#)

³⁴ Although improvements in transport accessibility, IT infrastructure and local skills may be possible, while most areas stand to benefit from improvements in firm-level factors. Source: ONS (2019) [Understanding spatial labour productivity in the UK](#)

³⁵ Syverson, C. (2011) [What Determines Productivity?](#)

³⁶ Haldane, A. (2018) [The UK’s Productivity Problem: Hub No Spokes](#)

³⁷ Syverson, C. (2011) [What Determines Productivity?](#)

³⁸ OECD (2019) [Reducing regional disparities in productivity in the United Kingdom](#)

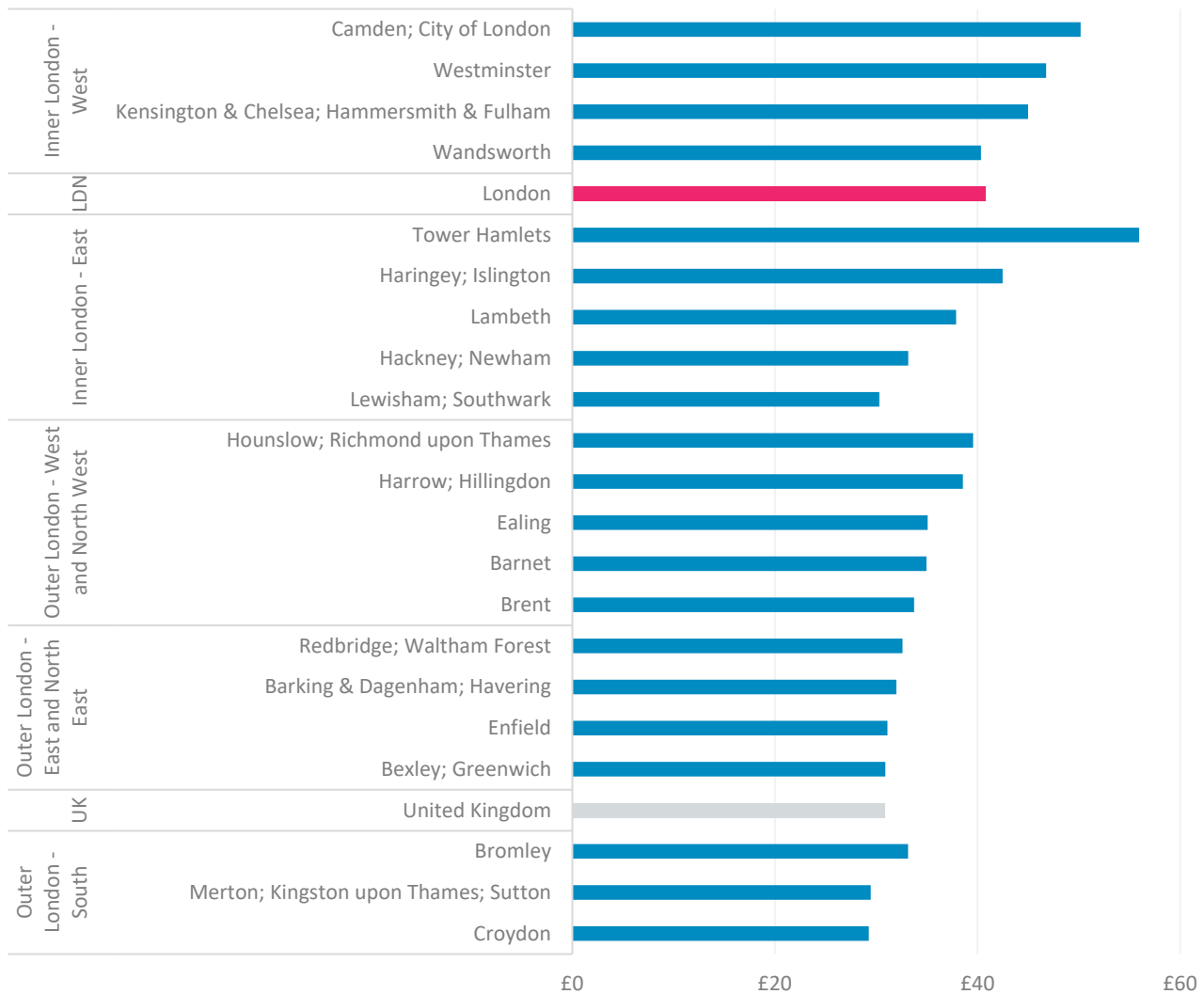
³⁹ For example, when firms collaborate or workers move between firms, bringing tacit knowledge with them. See: Gibbon, S. (2018) [Quantifying Wider Economic Impacts of Agglomeration for Transport Appraisal: Existing Evidence and Future Directions](#)

⁴⁰ Whereas less-productive firms will often struggle to compete in international markets and, for that reason, are more likely to remain operating in domestic markets. See: ONS (2019) [Understanding spatial labour productivity in the UK](#)

And considerable variation in local areas' productivity performance within the capital

To investigate the influence of location-related factors we can examine productivity levels for NUTS3 sub-regions within London.⁴¹ As Figure 4 shows, excluding rental income, it's Tower Hamlets which has the highest level of GVA per hour worked in the capital – 81% above the UK average and 37% above the London average in 2017.⁴² But while several other parts of inner London – Camden; City of London and Westminster in particular – also have relatively high productivity levels, the capital's worst performing NUTS3 areas – Croydon and Merton; Kingston upon Thames; Sutton – have productivity levels around 5% below the average for the UK and 28% below the London average.

Figure 4: London's productivity levels are particularly high in central areas but vary widely
GVA per hour worked by London NUTS3 subregion, 2017 (smoothed; excluding rental income)



Source: ONS Regional and Subregional Productivity. Note: data is sorted by productivity at the NUTS2 level.

⁴¹ See Appendix B for a breakdown of NUTS areas to London administrative geographies.

⁴² GVA per hour worked excluding rental income is used here because rental incomes significantly influence estimates at the NUTS3 level, particularly in Wandsworth, Redbridge and Waltham Forest and Bromley. Excluding rental incomes, such as imputed rental values capturing the value of housing services, provide a measure of output more closely related to the measurable labour input.

Comparing the NUTS3 areas with the highest and lowest levels of productivity suggests that aggregate labour productivity in Tower Hamlets (which includes Canary Wharf) is around 1.9 times higher than in Croydon. Clearly these areas differ on a range of economic and social characteristics, so this is not exactly a like-for-like comparison. Tower Hamlets, for example, had the second highest level of service exports per local unit in the country in 2016, reflecting its unique cluster of finance and business services firms.⁴³ At the same time, they both have a similar proportion of working age residents with NVQ4+ qualifications (both 47% compared to 52% for London overall) – a sign of the high degree of mobility exhibited by skilled workers, who often work and live in different places.⁴⁴

These sub-regional productivity disparities are also partly influenced by differences in sectoral mix. For example, the strong performance in 'Inner London – West' and 'Inner London – East' areas is supported by their high degree of relative specialisation in knowledge-intensive services sectors.⁴⁵ By comparison, in the cases of 'Outer London – East & North East' and 'Outer London – South', location quotients indicate a lower degree of specialisation in knowledge-intensive services and a relatively strong presence of (lower productivity) less-knowledge intensive services as well as real estate (see Appendix A.7).

Even then, differences in firm productivity *within* sectors continues to play the greater role in explaining variations in productivity at the sub-regional level (Appendix A.8).⁴⁶ It is also worth remarking that London's spatial productivity disparities have been persistent over several years. Figure 5 shows the coefficient of variation of average GVA per hour worked for NUTS3 areas in London between 2004 and 2017.⁴⁷ On this basis productivity differences were stable from 2004 to 2012 but have increased slightly over the last five years. This is the result of slower productivity growth in already worse performing areas in recent years (as discussed in Section 5).⁴⁸

⁴³ ONS (2019) [Regionalised estimates of Great Britain service exports by NUTS3, NUTS2 and joint authority](#)

⁴⁴ Highly skilled people who work in London tend to have higher geographic mobility than less skilled workers and often live and work in different boroughs, or even in local authorities outside London. Note, also, that the 'Finance & insurance' sector had the highest proportion of workers commuting into work from local authorities outside of the capital at the time of the 2011 census. Source: GLA Economics (2016) [Economic Evidence Base for London 2016 – Chapter 8](#)

⁴⁵ Relative to the national average, they had the highest shares of output in this broad industry group among all 40 NUTS2 regions in the UK in 2016. Source: ONS (2018) [Examining regional gross value added growth in the UK: 1998 to 2016](#)

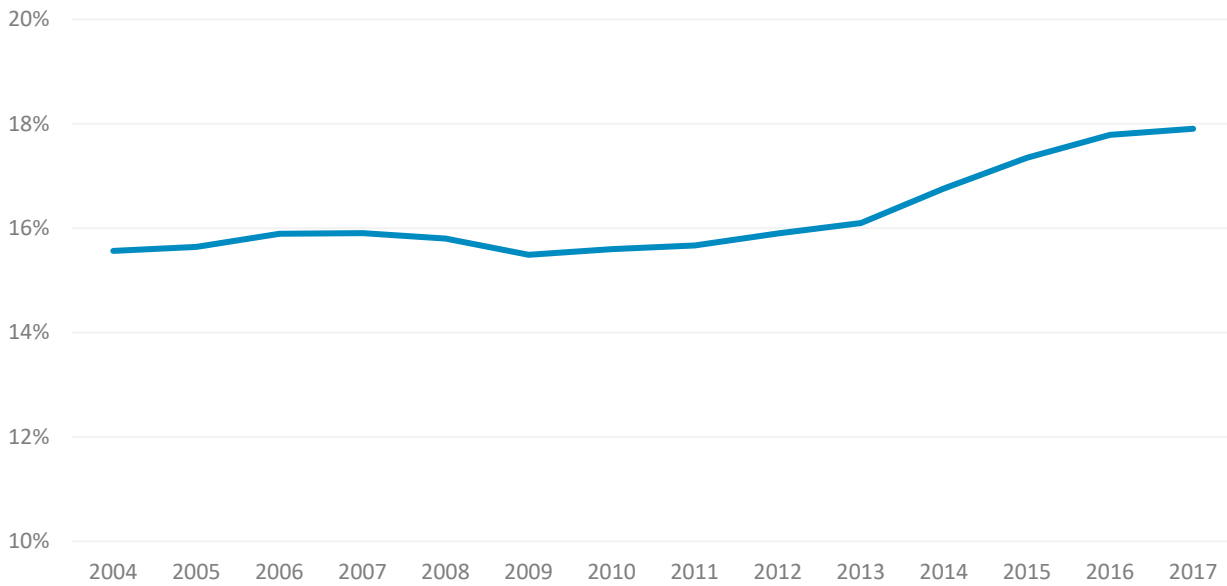
⁴⁶ There is only a one NUTS2 area in London – 'Outer London – East & North East' – where industry structure appears to play a greater role in explaining aggregate productivity in the non-financial business economy than firm productivities.

⁴⁷ This is a commonly used standardised measure of dispersion of a distribution (expressed as a percentage).

⁴⁸ By 2017, the top eight NUTS3 areas in terms of productivity levels in London were made-up of from the same eight as in 2004. At the same time, looking across the UK as a whole, spatial productivity differences at NUTS3 level have decreased slightly due mainly to lower productivity growth rates in the high-productivity areas of London. See next section.

Figure 5: Sub-regional productivity disparities have increased slightly over the last 5 years

Coefficient of Variation, GVA per hour worked (smoothed; excluding rental income), NUTS3 areas in London, 2004 to 2017



Source: ONS Regional and Subregional Productivity. Note: the coefficient of variance is the standard deviation of GVA divided by the mean, computed across the 21 NUTS3 areas in London.

5 Recent trends in productivity in London

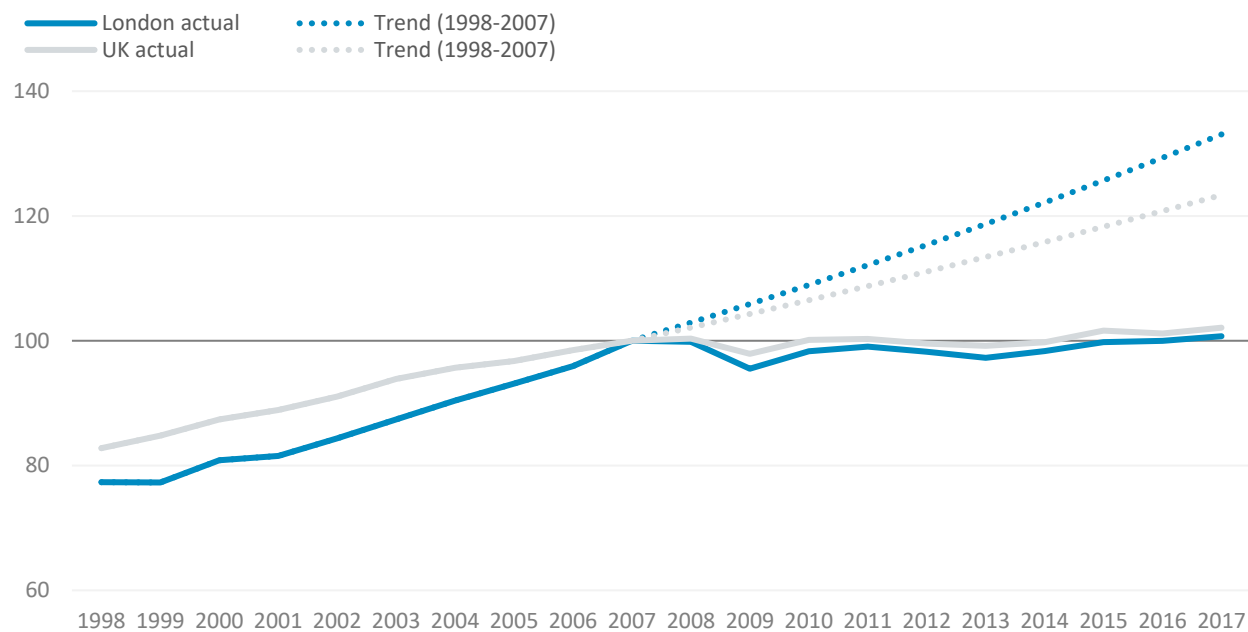
While there are productivity disparities across different parts of the capital’s economy – both within sectors and between sub-regions – it’s clear from the previous section that London doesn’t have a problem with its overall *level* of productivity. So what is it that’s so puzzling? To further understand the productivity challenges facing London, this section reviews recent trends in productivity *growth*.

London rate of productivity growth rate has fallen behind the UK average

Figure 6 plots an index of real GVA per hour worked for London and the UK as a whole between 1998 and 2017 (with 2007 being equal to 100). It indicates that from 1998-2007 labour productivity was rising for both geographies – at a rate of 2.9% per year on average in the capital and 2.1% nationally. It’s no surprise that productivity took a hit after the 2007/08 financial crisis, given the (negative) shock to economic output. What’s less clear is the picture thereafter: from 2010-2017 labour productivity flatlined in London and across the UK, rising by just 0.3% a year (on average) in both cases.

Figure 6: Productivity has flatlined in London and the UK post financial-crisis

Index of real GVA per hour worked, London and UK, 1998-2017, constant prices (2007=100)



Source: ONS Region by industry labour productivity

The result of this divergence is that – accounting for inflation – the level of labour productivity in London is now 24% below where it would have been had its pre-crisis (1998-2007) growth rate continued, compared to 17% lower nationally. Moreover, as Table 2 shows, London has seen the largest slowdown in real productivity growth of any UK region or country during this time, having recorded the fastest rate of productivity growth in 1998-2007 but only sixth fastest in 2010-2017.

It could be that productivity growth in the run up to the financial crisis was unusually (and unsustainably) strong, particularly the contribution made by the financial sector, which we return to later. If so, extrapolating based on pre-crisis trends might overstate the productivity shortfall.⁴⁹ On the other hand GLA Economics’ London labour market projections 2017 also looks at the rate of productivity growth in the

⁴⁹ See, for example: Office for Budget Responsibility (2012) [Economic and fiscal outlook - December 2012](#)

capital over a longer timeframe.⁵⁰ That work shows that productivity growth (based on output per job) has remained relatively close to its longer-term historic trend in most years since 1971. Although growth has tended to fluctuate with the economic cycle, the recent divergence still looks significant when set against several decades of economic data.⁵¹

Table 2: London's recent productivity slowdown is more severe than in other regions

Compound annual growth rate in real GVA per hour worked (%) by UK NUTS1 region

	1998-2007	2010-2017	Difference (pps)
North East	2.3%	0.6%	-1.7
North West	2.5%	0.2%	-2.3
Yorkshire and the Humber	2.5%	0.1%	-2.4
East Midlands	1.7%	0.3%	-1.4
West Midlands	1.8%	0.7%	-1.2
East of England	2.1%	0.0%	-2.1
London	2.9%	0.3%	-2.6
South East	1.9%	0.1%	-1.9
South West	1.8%	0.1%	-1.7
Scotland	2.1%	0.5%	-1.6
Wales	1.6%	0.7%	-1.0
Northern Ireland	1.9%	0.8%	-1.1
UK	2.1%	0.3%	-1.8

Source: ONS Region by industry labour productivity

This is a major issue, not least because productivity growth has historically supported income growth.⁵² Indeed, while growth in median real earnings for full-time employees in London rose by 2.0% per year on average from 1998-2007, in the period from 2010-2017 median earnings fell by 0.9% per year (adjusted for CPIH inflation). This has left median earnings for full-time employees 6.3% lower in 2017 than in 2010, compared to 3.9% lower for the UK as a whole. This fall in wages is prevalent across most industry groups in the capital with the productivity slowdown often cited as a major factor.⁵³

⁵⁰ GLA Economics (2017) [London labour market projections 2017](#) – see [Box 1](#) for long-term productivity trends.

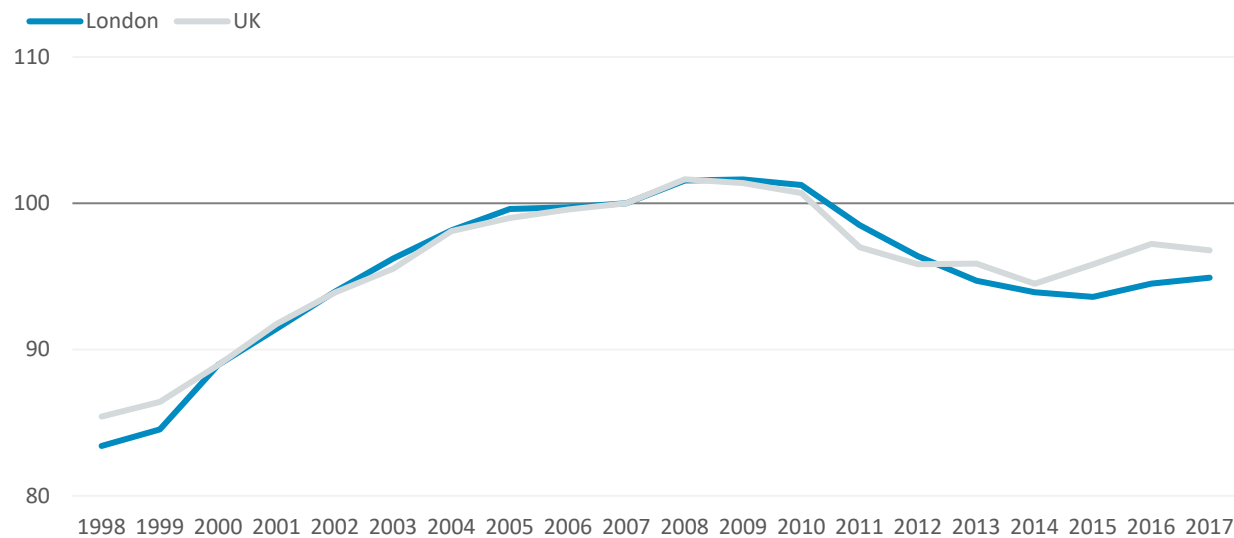
⁵¹ Albeit over a very long sweep of history the past decade isn't quite so unusual for the UK. That 'could be a good-news or a bad-news story'. For a discussion, see: Tenreyro, S. (2018) [The fall in productivity growth: causes and implications](#)

⁵² Haldane, A. (2018) [Productivity puzzles](#)

⁵³ For example, the ONS estimates that market sector wages would now be £5,000 higher for the average UK worker if productivity had grown in-line with its long-term trend since 2008 (assuming wages as a share of income had remained constant). Source: ONS (2019) [Productivity economic commentary: January to March 2019](#)

Figure 7: The productivity slowdown has coincided with a sharp drop in employee earnings

Index of median real employee earnings, London and UK, 1998-2017 (full-time gross weekly, 2007=100)



Source: ONS Annual Survey of Hours and Earnings. Note: data is adjusted for CPIH inflation.

London’s productivity slowdown is linked to strong growth in hours worked

To investigate London’s productivity slowdown further we can recall (from Section 3) that variations in labour productivity over time can be attributed to changes in either the: (i) amount of economic output produced (i.e. GVA) or (ii) quantity of labour inputs used in production (i.e. hours worked).

Table 3 disaggregates the changes in each of these variables for London and the UK for both the pre-financial crisis (1998-2007) and post-crisis (2010-2017) periods. It shows that London’s productivity growth slowdown is less about a fall in the rate of output growth, albeit the annual rate of real GVA growth was moderately lower in 2010-2017 than in 1998-2007 (down 0.6 percentage points). Instead, it’s the expansion in hours worked that stands out when it comes to explaining London’s productivity puzzle. Despite slower output growth, the annual rate of growth in hours worked more than doubled in 2010-2017 compared to 1998-2007 (rising by 1.9 percentage points)

Table 3: Annual productivity growth fell 2.6 percentage points in London, with an increase in employment (hours worked) playing a large role in the slowdown

Compound annual growth rate in productivity, real GVA, and hours worked (%), London and UK

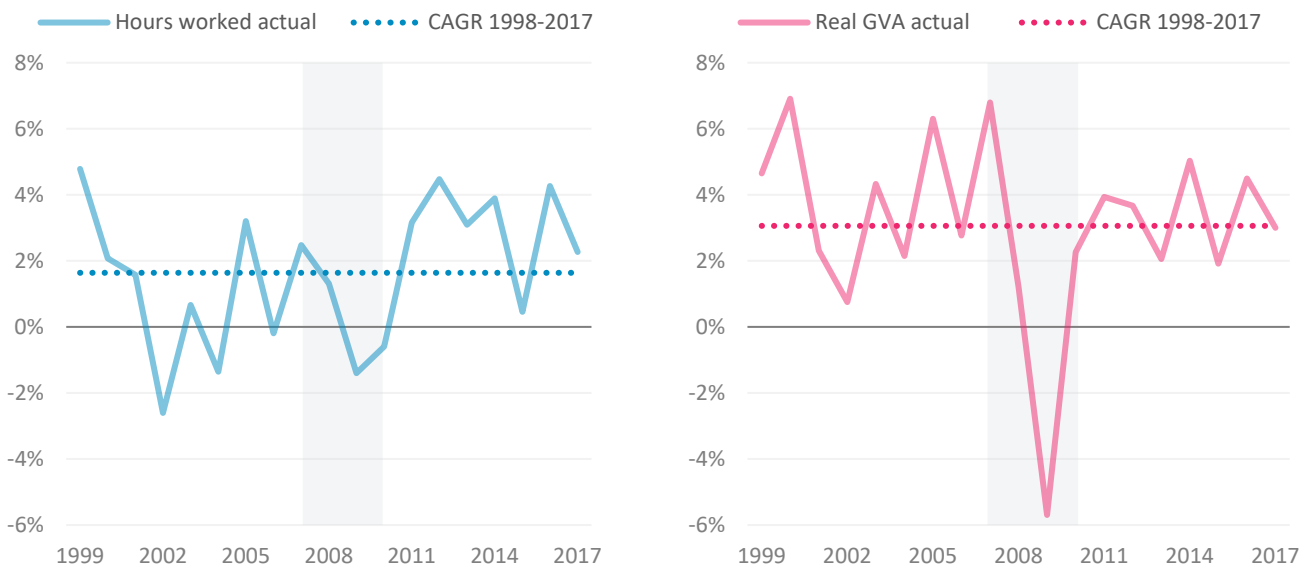
		London	UK
Productivity	CAGR 1998-2007	2.9%	2.1%
	CAGR 2010-2017	0.3%	0.3%
	Change in growth (pps)	-2.6	-1.8
Output (real GVA)	CAGR 1998-2007	4.1%	2.8%
	CAGR 2010-2017	3.4%	2.0%
	Change in growth (pps)	-0.6	-0.8
Hours worked	CAGR 1998-2007	1.2%	0.7%
	CAGR 2010-2017	3.1%	1.7%
	Change in growth (pps)	1.9	1.0

Source: ONS Region by industry labour productivity

This means that, as aggregate demand has picked-up following the financial crisis, employers in London have been increasing labour inputs nearly as fast as economic output has risen, resulting in only small changes in labour productivity.⁵⁴ Focusing on the seven years to 2017 alone the annual growth in total hours worked exceeded its 1998–2017 average in all but one year (2014), while real GVA growth has remained close to its longer-term average (Figure 8).⁵⁵ This is almost entirely down to an increase in jobs in the capital – up by around 945,000 from 2010 to 2017⁵⁶ – rather than a change in average hours worked, which is only marginally above pre-crisis levels.⁵⁷

Figure 8: Growth in hours worked has generally been stronger in the post-crisis period, while real GVA growth has been close to its average for the last two decades

Compound annual growth rate in hours worked (LHS) and real GVA (RHS), London



Source: ONS Region by industry labour productivity

A similar link between hours worked and real GVA growth is evident for most UK regions during this time, albeit the rate of growth in both hours and output has been higher in the capital than elsewhere since 2010.⁵⁸ What is puzzling, then, is that London's overall productivity slowdown cannot be down to lower output growth alone.⁵⁹ As noted earlier, evidence about the cyclical nature of productivity at the aggregate level had suggested that growth tends to be 'pro-cyclical'.⁶⁰ Yet, while productivity levels in London did decline during the 2007/08 downturn (falling by 4.5% in total between 2007 and 2009), productivity growth has remained persistently weak even as real GVA growth has recovered.

Changes in sectoral composition only explain a small part of the slowdown

One reason often presented for these trends is a change in the sectoral composition of the London economy. Specifically, a shift in employment from higher productivity to lower productivity sectors in the

⁵⁴ During this time real GVA increased by 3.4% per year on average in London, compared to hours worked growth of 3.1% per year.

⁵⁵ Exceeding it in four out of seven years. Note: these longer-term averages are, of course, influenced in part by the sharp decline in hours worked and GVA around the financial crisis.

⁵⁶ Based on 'productivity jobs'. Source: ONS (2019) [Region by industry labour productivity](#).

⁵⁷ The average number of hours worked for all workers in London was 33.9 hours per week in London in the 12 months to March 2019. This is the joint-highest level since 2004, although in the 12 months to September 2007 it reached 33.7 hours per week. Source: ONS (2019) [Regional labour market statistics in the UK: July 2019](#).

⁵⁸ ONS (2019) [Regional and sub-regional productivity in the UK: February 2019](#)

⁵⁹ Equally, the sustained stagnation in labour productivity itself may have restricted output growth in the post-crisis period.

⁶⁰ See, for example: Bhaumik, S (2011) [Productivity and the Economic Cycle](#). BIS Economics Paper No.12.

years following the financial crisis. As Section 4 (Figure 2) pointed out there are large variations in productivity levels between industries in the capital, with firms in less knowledge-intensive services (e.g. 'Accommodation & food', 'Wholesale & retail trade') often exhibiting lower levels of economic output per hour worked compared with firms in other sectors. All else equal, employment growth in these lower productivity sectors would tend to reduce the aggregate level of productivity in London.

On this basis Table 4 shows the proportion of jobs in London split by industry for various years between 1998 and 2017. Industry groups are ranked by their average level of GVA per hour worked for 1998-2017 and highlighted if they are in the top (green) or bottom (red) quarter for the change in the proportion of jobs over each of the selected time periods. This reveals an ongoing shift in the proportion of employment away from *some* higher productivity sectors over the last two decades (1998-2017), particularly notable in the case of 'Manufacturing' and 'Finance & insurance'. There has also been an increase in the share of jobs in less productive services (e.g. 'Accommodation & food' and 'Administrative & support services'). However, several further points are worth noting:

- There has been an ongoing decline in the proportion of jobs accounted for by some less productive sectors as well, including in 'Wholesale & retail trade' and 'Transport & storage'.
- Jobs growth has also been relatively strong in some higher productivity service sectors, for example in 'Information & communication' and 'Professional, scientific & technical' services.
- Finally, changes in sectoral composition have not been especially marked in the years between 2010 and 2017, with recent changes generally consistent with longer-term trends that were also apparent in the period of stronger productivity growth (1998-2007).

Table 4: There is little sign of a step-change in London's sectoral composition in the post-crisis period, suggesting a minimal role for 'between industry' changes Proportion of jobs and change in proportion of jobs by industry group, London, 1998-2017. Note: industry groups are ranked based on their average level of GVA per hour worked (low to high).

Industry group (low to high GVA per hour worked, avg. 1998-2017)	Proportion of 'productivity' jobs (percentage of total)				Change in proportion of jobs (percentage points)		
	1998	2007	2010	2017	1998-2007	2010-2017	1998-2017
Accommodation & food	5.4%	6.5%	6.7%	7.0%	1.1	0.3	1.6
Admin & support services	8.0%	9.4%	9.7%	10.4%	1.4	0.7	2.3
Health & social work	8.8%	8.3%	9.7%	10.1%	-0.5	0.3	1.3
Construction	4.8%	5.6%	4.9%	5.9%	0.7	1.0	1.0
Arts, entertainment & rec.	3.1%	3.3%	3.2%	3.4%	0.2	0.2	0.2
Wholesale & retail trade	14.1%	13.2%	12.5%	11.6%	-0.9	-0.8	-2.5
Public admin & defence	5.7%	5.0%	5.1%	3.9%	-0.6	-1.2	-1.8
Other services	2.5%	3.2%	3.1%	3.1%	0.7	0.0	0.6
Professional services	10.6%	12.1%	12.2%	13.0%	1.5	0.8	2.4
Manufacturing	6.4%	3.6%	2.7%	2.3%	-2.9	-0.4	-4.1
Transport & storage	6.2%	5.5%	5.2%	4.8%	-0.7	-0.3	-1.4
Education	5.8%	6.5%	7.6%	7.0%	0.7	-0.6	1.2
Information & comms.	7.9%	7.6%	7.3%	8.1%	-0.3	0.8	0.2
Non-Manufacturing Prod.	0.7%	0.6%	0.6%	0.5%	0.0	0.0	-0.1
Finance & Insurance	8.3%	7.6%	7.4%	6.8%	-0.8	-0.7	-1.6
Real estate	1.6%	1.8%	2.3%	2.2%	0.3	-0.1	0.6

Source: ONS Region by industry labour productivity. Note: highlighted cells are in the top (green) and bottom (red) quarter of industries for change in the proportion of jobs over the time periods selected.

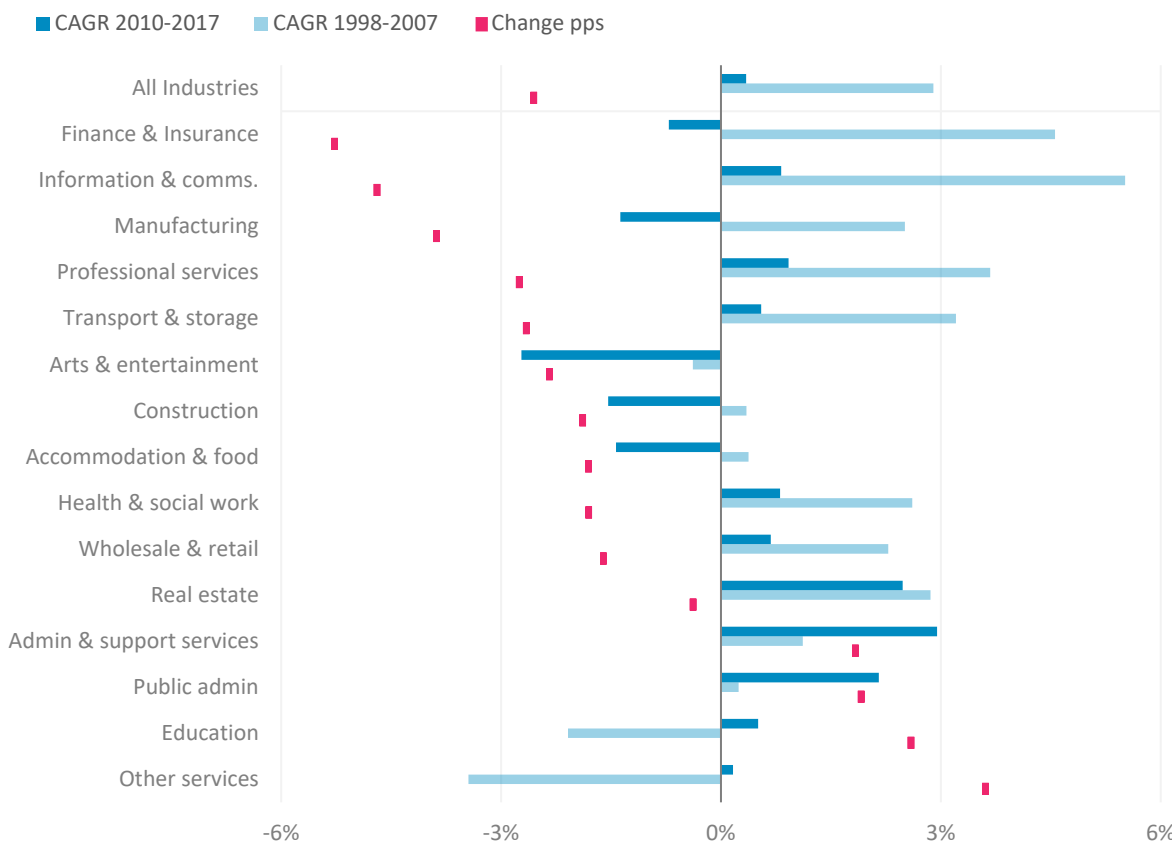
It therefore seems unlikely that sectoral shifts could fully explain the *recent* slowdown in productivity growth observed in the capital.⁶¹ Indeed, holding the proportion of hours worked constant across sectors from 2010 onwards would make only a small difference to London’s overall productivity performance during this time – accounting for around a seventh of the shortfall with pre-crisis trends by 2017.⁶² This suggests that, consistent with the evidence on the spatial drivers of productivity between regions, the main determinant of the productivity growth slowdown in London relates to wider developments *within* sectors and not changes in industrial composition.⁶³

Most sectors have recorded lower productivity growth post-crisis

The ‘within sector’ component of London’s productivity puzzle can be seen more clearly if we compare the rate of labour productivity growth for our two pre-crisis (1998-2007) and post-crisis (2010-2017) periods by individual industry groups in the capital – as illustrated in Figure 9.

Figure 9: Three-quarters of industry groups have experienced a labour productivity slowdown post-crisis, particularly those with higher rates of growth pre-crisis

Compound annual growth rate in real GVA per hour worked by industry, London, 1998-2007 and 2010-2017. Note: industry groups are ranked by the extent of their productivity slowdown.



Source: ONS Region by industry labour productivity. Note: excludes ‘Non-Manufacturing Production’ for readability – this industry group also saw a very sharp decline in productivity growth rates between 1998-2007 and 2010-2017 (falling by 9.1 pps).

⁶¹ There is some evidence that longer-term performance could be more affected by between industry developments. Source: Martin et al. (2018) [The city dimension of the productivity puzzle: the relative role of structural change and within-sector slowdown](#).

⁶² In other words, if the sectoral composition of hours worked had remained unchanged from 2010 to 2017. So, for example, if the proportion of total hours worked in industry group X was 10% in 2010 we keep that figure constant in the years to 2017. This allows us to isolate the impacts of changes in composition ‘between sectors’ on overall productivity performance.

⁶³ ONS (2019) [Understanding spatial labour productivity in the UK](#)

This shows that, out of 16 industry groups, three-quarters recorded a lower average rate of productivity growth in 2010-2017 than in 1998-2007 – including six sectors where productivity actually shrunk between 2010 and 2017 (‘Non-manufacturing production’ is not included above).⁶⁴

What’s more, it’s those sectors which showed the highest rates of labour productivity growth in the pre-crisis period that subsequently experienced the most pronounced slowdowns in 2010-2017. For instance in ‘Finance & insurance’ (-5.3 percentage points), ‘Information & communication’ (-4.7 pps) and ‘Manufacturing’ (-3.9 pps). This fits with evidence suggesting that the UK’s productivity puzzle has mainly been driven by *more* productive firms not keeping pace with their previous performance.⁶⁵

At the same time, only four out of 16 industry groups in London recorded higher productivity growth in the post-crisis period compared to 1998-2007. As per Figure 9, two of these – ‘Education’ and ‘Other services’ – are sectors that had shrinking productivity (negative growth) on average in the years from 1998-2007; the other two had relatively slow productivity growth in the years pre-crisis.

GVA growth has been matched by increases in hours worked in most sectors

Sector-specific factors will play a part in these productivity trends. It is notable that half of industry groups in London recorded a lower rate of real GVA growth in the post-crisis period compared to 1998-2007⁶⁶, and all but one of these sectors saw a slowdown in measured productivity growth.⁶⁷ The sharp downturn in output growth in ‘Finance & insurance’ is especially marked (see Box 3).

Still, as with our earlier analysis, lower productivity growth at the sector-level is also associated with a relatively high rate of growth in labour inputs post-crisis. As Figure 10 shows, the majority (10) of industry groups in London exhibited a higher rate of growth in hours worked in 2010-2017 than in 1998-2017. Some of those with sharper productivity slowdowns – including ‘Finance & insurance’ – combined this with lower real GVA growth. There were also five sectors where the rate of output growth increased post-crisis, but at a lower rate than hours worked (top-right quadrant). On the other hand, in each of the sectors with a faster rate of productivity growth in 2010-2017, growth in hours worked fell.

⁶⁴ Namely: ‘Arts & entertainment’; ‘Construction’, ‘Accommodation & food’, ‘Manufacturing’; and ‘Finance & insurance’.

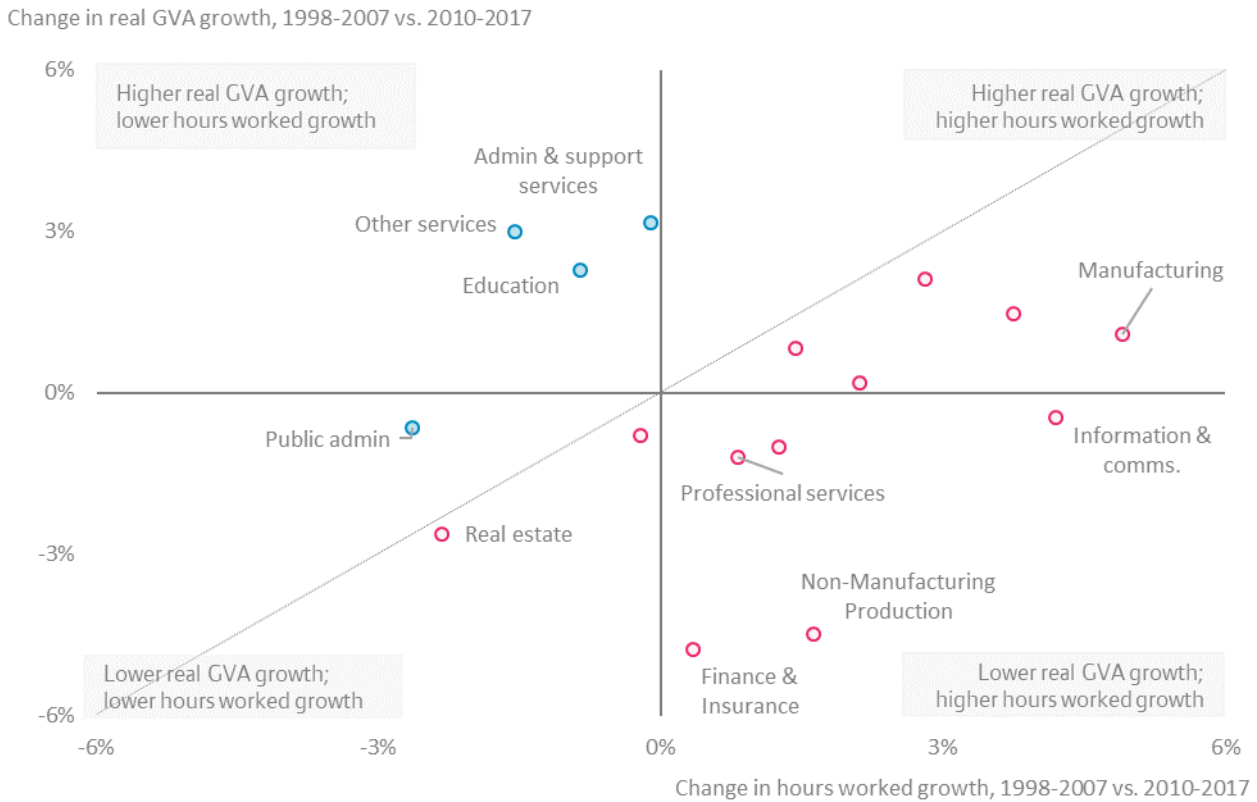
⁶⁵ See, for example: Schneider, P. (2018) [Decomposing differences in productivity distributions](#). Bank of England: Staff Working Paper No. 740. Note, however, 2004 to 2007 may have been a period of unusually strong growth at the top of the productivity distribution. See also: ONS (2019) [Firm-level labour productivity measures from the Annual Business Survey, Great Britain: 2017](#)

⁶⁶ ONS (2018) [Regional gross value added \(balanced\) reference tables](#). NUTS1 and UK chained volume measures in 2016 pounds.

⁶⁷ In ‘Public administration and defence’ annual productivity growth rose by 2.2% per year in 2010-2017 compared with 0.2% per year in 1998-2017. This increase in productivity growth occurred despite lower real GVA growth. The reason being a particularly sharp drop in hours worked which fell by 1.4% per year in the post-crisis period, having increased by 1.3% per year pre-crisis.

Figure 10: Most sectors have seen the rate of growth in labour inputs increase in the post-crisis period, while only half have seen an increase in output growth

Change in CAGR in real GVA and hours worked growth, 1998-2007 vs 2010-2017. Blue circles (o) = higher productivity growth post-crisis; red circles (o) = lower productivity growth post-crisis.



Source: ONS Region by industry labour productivity. Note: the 45-degree line represents equal change in GVA growth and hours worked growth in 2010-2017 compared to 1998-2007. Any points above this line represent an increase in productivity growth post-crisis, while points below represent a slowdown in the rate of productivity growth.

Box 3: Focus on London’s ‘Finance & insurance’ sector

The fall in productivity growth in London’s financial sector is particularly striking. It had one of the highest rates of labour productivity growth in the run-up to the crisis: rising by 4.6% per year from 1998–2007. Yet from 2010–2017 labour productivity actually declined by 0.7% per year. This was previously singled-out by the ONS as the largest industry-region contribution to the productivity slowdown across the UK (albeit that analysis used slightly different time periods than we do here).⁶⁸

Behind this productivity slowdown is a marked fall in output growth. From 1998–2017 ‘Finance & insurance’ had the fourth highest rate of real GVA growth in the capital (rising by 5.4% per year); but by 2010–2017 this dropped to 0.7% per year, the third lowest. This downturn has been attributed to a process of deleveraging following unsustainable growth in the years preceding 2007/08 (supported by underpricing of risk). Mismeasurement of financial sector output is another possible factor.

The sharp finance productivity slowdown can, in turn, help to explain the depth of London’s productivity puzzle. Based on our estimates ‘Finance & insurance’ alone accounts for a quarter of the slowdown in the capital’s aggregate productivity growth compared to pre-crisis trends. Without its contribution the productivity shortfall identified in Figure 6 would fall from a 24% gap to 18% – still large, but notably lower. This is because, without the financial sector, London’s productivity growth would have been both slower in the years leading up to the crisis and faster after 2010.⁶⁹

Table 5: ‘Finance & insurance’ accounts for a quarter of London’s productivity shortfall

Annual average real GVA per hour worked growth in London, 1998–2007 vs. 2010–2017

	All industries	Finance & insurance (only)	All industries excl. Finance & insurance
CAGR 1998–2007	2.9%	4.6%	2.4%
CAGR 2010–2017	0.3%	-0.7%	0.7%
Gap with pre-crisis trend	-24%	-42%	-18%

Source: GLA Economics calculations / ONS Region by industry labour productivity

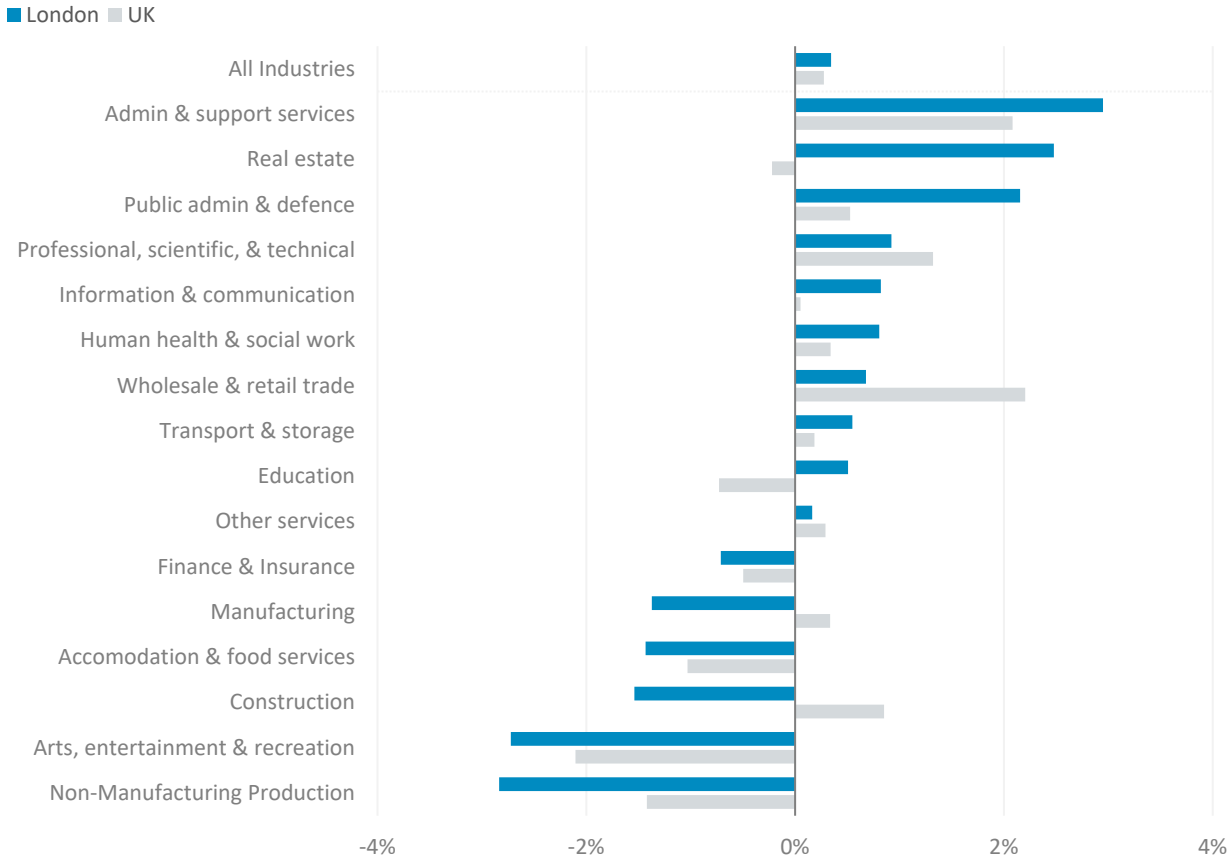
Sector trends at the London-level are also reasonably aligned with national performance (Figure 11). Annual average growth rates in GVA per hour worked were within 1 percentage points of the UK rate for most sectors in 2010–2017. Both geographies had the same number of sectors (6) with negative productivity growth during this time, with some degree of overlap. The most significant divergences were in ‘Real estate’ – where GVA per hour worked grew relatively strongly in the capital but fell across the UK as a whole – and in ‘Manufacturing’ and ‘Construction’ – where the opposite applies (i.e. productivity declined in London since 2010 while increasing slightly across the UK overall).

⁶⁸ ONS (2018) [Industry by region estimates of Labour Productivity: 2016](#)

⁶⁹Note: this only considers direct impacts and there may be indirect ‘spillover effects’ for other complementary industries.

Figure 11: In most sectors post-crisis productivity growth is in-step with UK trends

Compound annual growth rate in real GVA per hour worked by industry, London and UK, 2010-2017. Note: industry groups are ranked based on highest to lowest growth in London.



Source: ONS Region by industry labour productivity

There is also sub-regional variation within London since 2010

Further to variations at the sector-level, there are also major differences in post-crisis productivity trends at a sub-regional level. Figure 12 shows the total growth in real GVA and hours worked between 2010 and 2017 for 41 UK NUTS2 areas, with those in London highlighted depending on whether productivity has increased (blue) or decreased (red). It shows that:

- In terms of real GVA growth (the vertical axis), the three NUTS2 areas with the fastest growth were all in London.⁷⁰ In London, only ‘Outer London – South’ was in the bottom half of areas for this measure.
- In terms of hours worked growth (the horizontal axis), London also had the leading two NUTS2 areas, with all five areas in the capital featuring among the top ten NUTS2 geographies in the UK for growth in hours worked.

⁷⁰ ‘Inner London – West’, ‘Outer London – West and North West’, and ‘Inner London – East’, with real GVA growth of 33%, 32% and 23% respectively between 2010 and 2017.

Figure 12: There have been significant differences in productivity trends between different parts of the capital

Scatter plot of total growth in real GVA and total growth in hours worked for NUTS2 sub-regions of the UK, 2010 to 2017



Source: ONS (2019) *Regional and sub-regional productivity in the UK*. Note: the 45-degree line represents equal GVA growth and hours worked growth in 2010-2017. For instance, a 5% GVA growth corresponding to a 5% hours growth results in a 0% change in productivity. Any points above this line represent an increase in productivity, while points below represent a decrease.

The result of these trends is that, out of 5 NUTS2 areas in the capital, only two recorded an increase in labour productivity in the post-crisis period. ‘Inner London – West’ and ‘Outer London – West and North West’ both recorded a rise in the level of GVA per hour worked between 2010 and 2017. The remaining three areas – ‘Outer London – South’, ‘Outer London – East & North East’ and Inner London – East’ – all saw productivity levels fall during this time, as hours worked growth exceeded output growth.

Looking more closely at sub-regional trends, the parts of the capital with the lowest rates of productivity growth in the post-crisis period include several identified as lower performing at the end of the previous section. For example, NUTS3 areas in outer London such as Croydon and Barking & Dagenham; Havering were among those with the lowest rates of annual growth in real GVA per hour worked between 2010 and 2017.⁷¹ Whereas Westminster had the fastest rate of productivity growth, followed by Hounslow; Richmond upon Thames (both areas that exhibit higher levels of labour productivity).

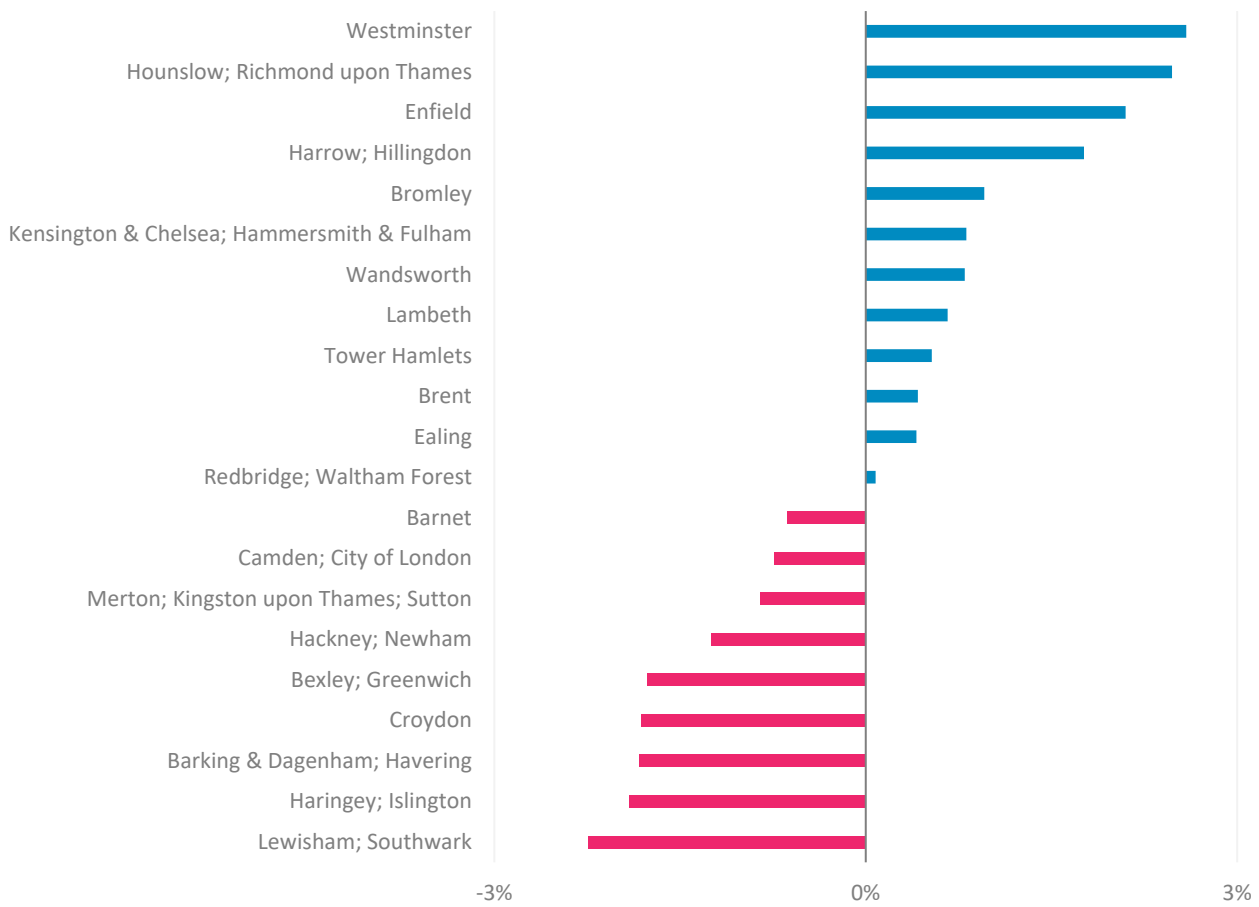
Yet other parts of the capital have not followed this pattern. Figure 13 further illustrates the extent of variation in productivity trends since 2010. It shows that just under half (9 out of 21) of the capital’s NUTS3 areas saw productivity fall between 2010 and 2017. This includes some of London’s higher-productivity areas – most notably Camden; City of London, which may reflect the sharp downturn in the ‘Finance and insurance’ sector. At the same time, estimated productivity growth in Enfield, which had one of the lowest levels of GVA per hour worked in London in 2010, has been relatively strong recently.⁷²

⁷¹ ONS (2019) [Subregional productivity: labour productivity indices by UK NUTS2 and NUTS3 subregions](#)

⁷² Enfield had the lowest GVA per hour worked (smoothed) excluding rental income in 2010. Source: ONS (2019) [Subregional productivity: labour productivity indices by UK NUTS2 and NUTS3 subregions](#)

Figure 13: There is even more variation in productivity trends at a NUTS3 level, with 9 out of 21 areas seeing productivity fall in real terms between 2010 and 2017

Compound annual growth rate in real GVA per hour worked, London NUTS3 areas, 2010-2017



Source: ONS Subregional productivity

6 Explaining London’s productivity puzzle

Explaining the recent slowdown in productivity growth has been a significant challenge for academics and policy-makers alike. Several factors are likely to have influenced London’s stalling productivity performance. Exposure to slower global trade growth and weaker financial sector performance compared to pre-financial crisis years are among them. An explanation to the puzzle must also explain the increase in the growth of labour inputs post-crisis; while there are further concerns that the rate of diffusion of ideas and technologies may have been declining recently.

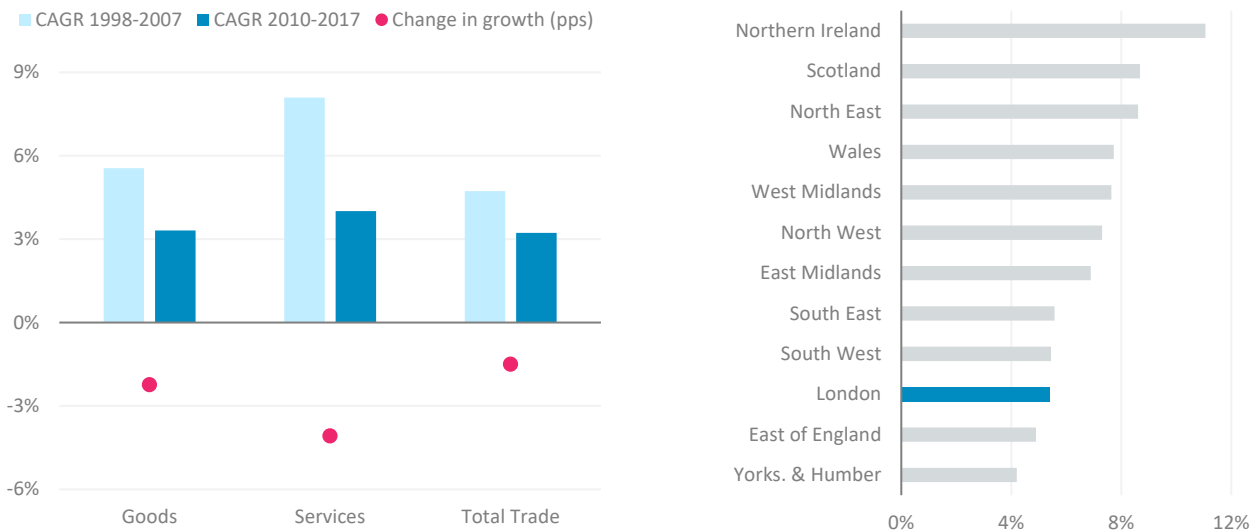
A general slowdown in trade and finance

The openness of the London economy and the size of its financial sector mean that global developments, such as slower world trade growth and financial sector deleveraging, are likely to have had a particular impact in the capital. Indeed, while Section 5 pointed towards a recovery in economic growth in the capital since 2010, London’s annual rate of output growth has moderated in the post-crisis period, down (on average) by 0.6 percentage points per year compared with 1998–2007.⁷³

This is partly linked to a slowdown in world trade. Overall trade has been on a downward trend relative to global GDP since 2011.⁷⁴ Focusing on the UK alone indicates that services exports have been especially affected (Figure 14): from 2010 to 2017 the annual average rate of growth in UK service exports was half that recorded in the pre-crisis period (4.0% a year, down from 8.1%). While data on international trade is more limited at a sub-national level, ONS estimates show that London had a lower rate of growth in service exports than most UK regions in the five years to 2016.⁷⁵ This is largely down to sluggish growth in London’s financial service exports, which only marginally increased in value from 2011 to 2016 (in nominal terms).

Figure 14: UK export growth has slowed in the post-crisis period, including a sharp slowdown in services trade in London

Compound annual growth rate in UK exports (LHS) and London service exports 2010–2017 (RHS)



Source: ONS UK trade time series / Regionalised estimates of Great Britain service exports by NUTS3, NUTS2 and joint authority

⁷³ Real gross values added (GVA) rose by 3.4% per year on average from 2010–2017, down from 4.1% per year from 1998–2007.

⁷⁴ Song Shin, H. (2019) [What is behind the recent slowdown?](#) Presentation at the ‘Public Finance Dialogue’ workshop arranged by German Federal Ministry of Finance and Centre for European Economic Research (ZEW).

⁷⁵ London accounts for 46% of UK service exports in current prices. See: ONS (2019) [Regionalised estimates of UK service exports](#)

A high proportion of the UK exporters is based in the capital and, as observed in Section 4, these firms tend to be more productive than their domestic-facing counterparts. Recent analysis by the European Central Bank further supports this positive link between trade growth and labour productivity over the medium term.⁷⁶ Along these lines it is striking that the industries in London that have seen the biggest fall in productivity growth have been high exporting sectors that are more dependent on global demand (e.g. 'Finance & insurance', 'Information & communication' and 'Manufacturing' – see Figure 9).⁷⁷

The economic outlook is also highly uncertain (see below). As discussed in Section 5 around a quarter of the capital's productivity slowdown can be credited to the boom and bust in the 'Finance & insurance' sector alone – a finding consistent with previous research.⁷⁸ Although that sector's performance should improve as deleveraging runs its course, productivity growth is unlikely to return fully to pre-crisis rates.⁷⁹ The UK's exit from the European Union (EU) could also create new challenges. There is evidence that an increase in trade barriers associated with Brexit would have more adverse economic impacts on areas specialised in business activities and financial intermediation.⁸⁰ Recent OECD research also points to a negative economic impact of regulatory restrictions on services trade, especially for smaller firms.⁸¹

Falling real wages and a ready supply of workers

Yet, as shown in Section 5, productivity growth fell in most industries in London over recent years, suggesting that wider factors operating across sectors must be at play. What is generally noteworthy is that since 2010 London firms have hired labour nearly as fast as economic output has increased. In fact, almost three-quarters of industry groups saw the rate of growth in hours worked increase in the post-crisis period, despite more subdued growth in economic output.

This has been partly attributed to a flexible labour market facilitating a fall in real wages. Pessoa & Van Reenen (2014), for example, point towards an unusually 'dramatic' fall in real wages in the post-crisis period as an explanation for low labour productivity growth (linked to weaker union power and welfare reforms).⁸² The sharp decline in median earnings in London (Figure 7) has also been associated with changes in the composition of the employed labour force, including an increase in migrant workers and non-standard forms of employment.⁸³ The capital's recent pay squeeze has been especially pronounced for those entering employment for the first time (i.e. from unemployment or leaving education).⁸⁴

In this context, it's possible that a combination of low wage growth and high labour supply may have reduced the incentive for firms to invest in measures to improve labour productivity, i.e. if employers have been able to hire labour at a relatively low cost recently. If so, that could reverse as the labour market tightens and wage growth recovers.⁸⁵ When considering this potential explanation it's worth keeping in mind that low productivity is itself cited as a key factor in low wage growth. However, there is growing body of evidence that the relationship could go both ways.⁸⁶ Increases in labour costs could, for example, spur managers into organisational improvements and in turn better productivity.⁸⁷

⁷⁶ European Central Bank (2017) [ECB Economic Bulletin, Issue 7](#)

⁷⁷ Also see: Riley, R., Rincon-Aznar, A., & Samek, L. (2018) [Below the Aggregate: A Sectoral Account of the UK Productivity Puzzle](#)

⁷⁸ McKinsey Global Institute (2018) [Solving the United Kingdom's productivity puzzle in a digital age](#)

⁷⁹ Since those were supported by excessive risk-taking. See: Tenreyro, S. (2018) [The fall in productivity growth: causes and implications](#)

⁸⁰ Dhingra, S., Machin, S., & Overman, H. (2017). [Local economic effects of Brexit](#). National Institute Economic Review.

⁸¹ Rouzet, D, Benz, S. & Spinelli, R. (2017) [Trading firms and trading costs in services: Firm-level analysis](#). OECD Trade Policy Papers.

⁸² Pessoa, J. P. & Van Reenen, J. (2014) [The UK Productivity and Jobs Puzzle: Does the Answer Lie in Wage Flexibility?](#)

⁸³ Note, however, the balance of recent research points towards beneficial impacts of migration (especially high-skilled migration) on UK productivity and the skills of the workforce have improved in recent years.

⁸⁴ Resolution Foundation (2018) [London Stalling: Half a century of living standards in London](#)

⁸⁵ Bank Underground (2018) [Tight labour markets and self-service beer: is the productivity slowdown about to reverse?](#)

⁸⁶ See, for example: Tuckett, A. (2017) [Does productivity drive wages? Evidence from sectoral data](#)

⁸⁷ Riley, R. & Rosazza Bondibene, C. (2015) [Raising the standard: Minimum wages and firm productivity](#)

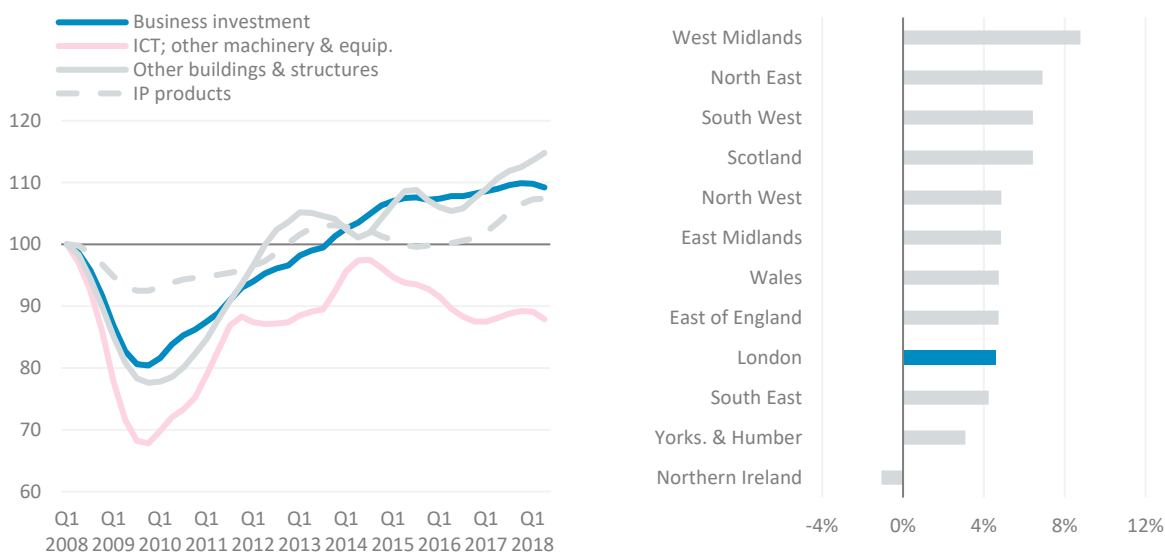
Low business investment and persistent economic uncertainty

The other side of the jobs-rich recovery is that, as firms have expanded through increased hiring, investment has become increasingly subdued due to a combination of lower aggregate demand and persistent economic uncertainty. In other words, according to the McKinsey Global Institute, ‘[l]ow wage growth reinforced hiring ahead of capital investment’.⁸⁸ The resulting weakness in the growth of capital relative to labour – known as ‘capital deepening’ – has been widespread across sectors and has been estimated to account for over half of the overall UK productivity slowdown.⁸⁹

As Figure 15 shows UK business investment fell sharply in 2008/09. While it recovered to pre-crisis levels by 2013, investment has stalled again recently, falling in each of the four quarters of 2018 (the most sustained downturn since 2008).⁹⁰ The volume of investment in ICT equipment and other machinery has remained particularly weak in the post-crisis period. This is despite earlier research identifying a key role for ICT capital in boosting labour productivity growth in the UK, highlighting its positive impacts on innovation and management at the firm-level.⁹¹ There are, along these lines, substantial productivity gains associated with the adoption of new digital technologies.⁹²

Figure 15: Business investment has stalled recently, while investment in ICT equipment has been declining since 2014

Moving averages of UK business investment and selected components (Index 2008=100) (LHS) and compound annual growth rate in Regional Gross Fixed Capital Formation, 2010-2016 (RHS)



Source: Office for National Statistics.⁹³ Note: UK Business Investment is a two-term by four-term moving average (chained volume measure, seasonally adjusted); Regional GFCF are not official UK statistics and should only be regarded as estimates.

⁸⁸ McKinsey Global Institute (2018) [Solving the United Kingdom’s Productivity Puzzle in a Digital Age](#)

⁸⁹ Tenreyro, S. (2018) [The fall in productivity growth: causes and implications](#). Also note: lack of capital investment has become an increasingly important factor since 2012. For a discussion, see also: New Economics Foundation (2019) [Time for Demand](#)

⁹⁰ ONS (2019) [Business investment in the UK: analysis by asset](#)

⁹¹ Bhaumik, S (2011) [Productivity and the Economic Cycle](#). BIS Economics Paper No.12.

⁹² Sorbe, S., et al. (2019) [Digital Dividend: Policies to Harness the Productivity Potential of Digital Technologies](#). OECD.

⁹³ ONS (2019) [Business investment in the UK: analysis by asset](#) / ONS (2017) [Regional Gross Fixed Capital Formation, NUTS1 and NUTS2, 2000 to 2016](#)

Like productivity, aggregate business investment tends to be pro-cyclical, particularly for small and medium-sized enterprises.⁹⁴ In that respect it's not surprising that it fell following the financial crisis. Again, the main puzzle lies in the sluggish recovery and recent flatlining of investment growth.

- Bonciani and Oh (2019) argue that macroeconomic uncertainty can have negative long-run effects on investment in physical capital and R&D (and thus productivity).⁹⁵
- There are signs that Brexit has become a particularly important source of uncertainty in recent years, with firms 'putting new capital investment on hold' until there is 'greater clarity'.⁹⁶ Bloom et al. (2019) recently estimated that the Brexit process has gradually reduced UK investment levels by approximately 11% over the three years since the referendum.⁹⁷
- At the same time, Coyle and Nugen (2019) suggest that the rise of certain digital technologies, such as cloud computing as a general-purpose technology, may not be fully captured in economic statistics but could lead to reduced investment in other hardware and software.⁹⁸

Detailed estimates of business investment are not available below the national level. However, data of regional gross-fixed capital formation suggest that headline trends in London have not been out-of-step with most other parts of the country since 2010 (Figure 14). There is also some evidence that more internationally orientated firms (which are relatively prominent in London) are more exposed to Brexit-related uncertainties. That said, the overall distribution of investment between regions does not appear to be a main explanation for productivity disparities; the specific types of investment also matter.⁹⁹ According to OECD analysis raising the level of capital intensity in knowledge-intensive services sectors – such as 'Information & communication' – would deliver the largest productivity boost in the capital.

Unequal diffusion of technology and working practices

Finally, while the post-crisis productivity slowdown has been more pronounced at the top tail of the distribution – among higher-productivity businesses – there are growing concerns about the continued low rate of productivity growth in many other firms. As Section 4 highlighted levels of labour productivity vary widely across businesses. London as a whole has a relatively large proportion of businesses that exhibit higher levels of productivity, but there is still a substantial proportion where productivity is clustered at lower (or negative) levels.

Evidence shows that these firms have made only a limited contribution to productivity growth, both before and after the financial crisis. Nationally, the level of aggregate labour productivity growth for firms in the bottom 90% of the productivity distribution was still below pre-crisis levels in 2017 (in constant prices), while productivity in the top 10% of firms had increased.¹⁰⁰ Bank of England analysis suggests that this finding is unlikely to be confined to a particular region.¹⁰¹ As Figure 16 shows, far lower productivity growth rates among firms in the bottom 99% of the productivity distribution also seem to be a feature of the London economy, if less pronounced than elsewhere.

⁹⁴ Bhaumik, S (2011) [Productivity and the Economic Cycle](#). BIS Economics Paper No.12

⁹⁵ Bonciani, D. & Jason Oh, J. (2019) [The long-run effects of uncertainty shocks](#). Bank of England Staff Working Paper No. 802

⁹⁶ Bank of England (2018) [Agents' summary of business conditions - 2018 Q4](#)

⁹⁷ Bloom, N., et al. (2019) [The impact of Brexit on UK firms](#). Bank of England Staff Working Paper No. 818

⁹⁸ Coyle, D. & Nguyen, D. (2019) [Cloud Computing, Cross-Border Data Flows and New Challenges for Measurement in Economics](#)

⁹⁹ Kierzenkowski, R., P. Gal & G. Fulop (2017) [Where to get the best bang for the buck in the United Kingdom? Industrial strategy, investment and lagging regions](#). OECD Economics Department Working Papers, No. 1426.

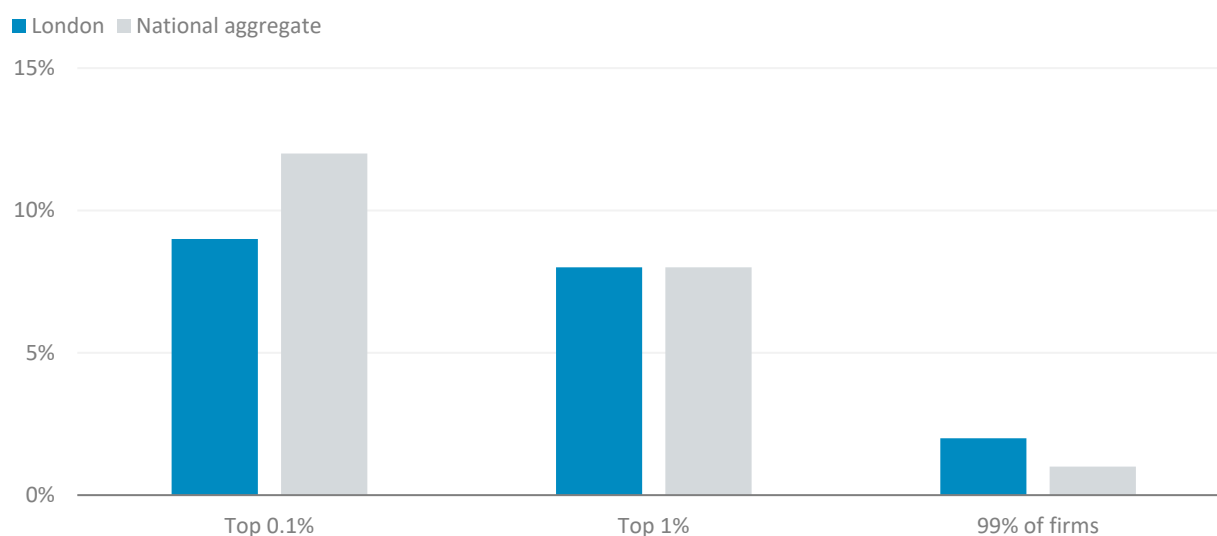
¹⁰⁰ ONS (2019) [Firm-level labour productivity measures from the Annual Business Survey, Great Britain: 2017](#)

¹⁰¹ Haldane, A. (2018) [The UK's Productivity Problem: Hub No Spokes](#)

Several factors have been linked to this variation in business-level productivity growth. There are, for example, growing concerns about rising market power in digital intensive industries and subdued rates of labour market churn in the UK.¹⁰² A related possibility is that technology diffusion has slowed, with the UK overall now ranking 38th on one global measure of knowledge diffusion, down from 18th in 2013.¹⁰³ Consistent with this line of argument, recent OECD research cites the ‘uneven’ uptake of digital technologies as an important barrier to broad-based productivity growth, pointing towards a range of measures to stimulate efficient digital adoption and diffusion.¹⁰⁴

Figure 16: There is wide variation in labour productivity growth between businesses

Annualised growth in aggregate firm productivity between 2004 and 2014 (by productivity distribution)



Source: ONS Research Database and Bank of England calculations. Note: data refers to the non-financial business sector. Calculations over the ten-year period are only possible for firms that exist for entire period and sampled throughout; these are likely to be larger firms.

Access to ICT-related skills is highlighted as a key factor to enable the diffusion of digital technologies and maximise their productivity impact. There is also a strong link between management practice scores and labour productivity.¹⁰⁵ According to one ONS study a firm that improves its management score from the 25th percentile to the median could see productivity rise by almost a fifth.¹⁰⁶ Yet only 9% of London organisations were regarded as high performance employers in the 2017 Employers Skills Survey, suggesting that there is scope to support greater take-up of these practices.¹⁰⁷

The outlook for productivity growth remains unclear

Given the complex mix of factors weighing on London’s productivity performance, the outlook for future productivity growth remains highly uncertainty. Some of the issues which have been mentioned here are likely to ease in the short to medium term. Particularly as deleveraging in the financial sector runs its course, or as workers become more confident in a tightening labour market. Yet other influences, such as the UK’s expected departure from the EU and the ongoing emergence of digital technologies, are likely to affect

¹⁰² For a useful discussion, see: Haldane, A. (2018) [The UK’s Productivity Problem: Hub No Spokes](#)

¹⁰³ Cornell University, INSEAD and WIPO (2017) [The Global Innovation Index 2017](#)

¹⁰⁴ For example, see: Sorbe, S., et al. (2019) [Digital Dividend: Policies to Harness the Productivity Potential of Digital Technologies](#). OECD.

¹⁰⁵ Byson, A. & Forth, J. (2018) [The Impact of Management Practices on SME Performance](#). NIESR Discussion Paper No. 488.

¹⁰⁶ ONS (2018) [Management practices and productivity in British production and services industries - initial results from the Management and Expectations Survey: 2016](#)

¹⁰⁷ Defined as adopting at least 14 of the 21 High Performance Working practices covered in the Employers Skills Survey. Source: Department for Education (2018) [Employer Skills Survey 2017](#)

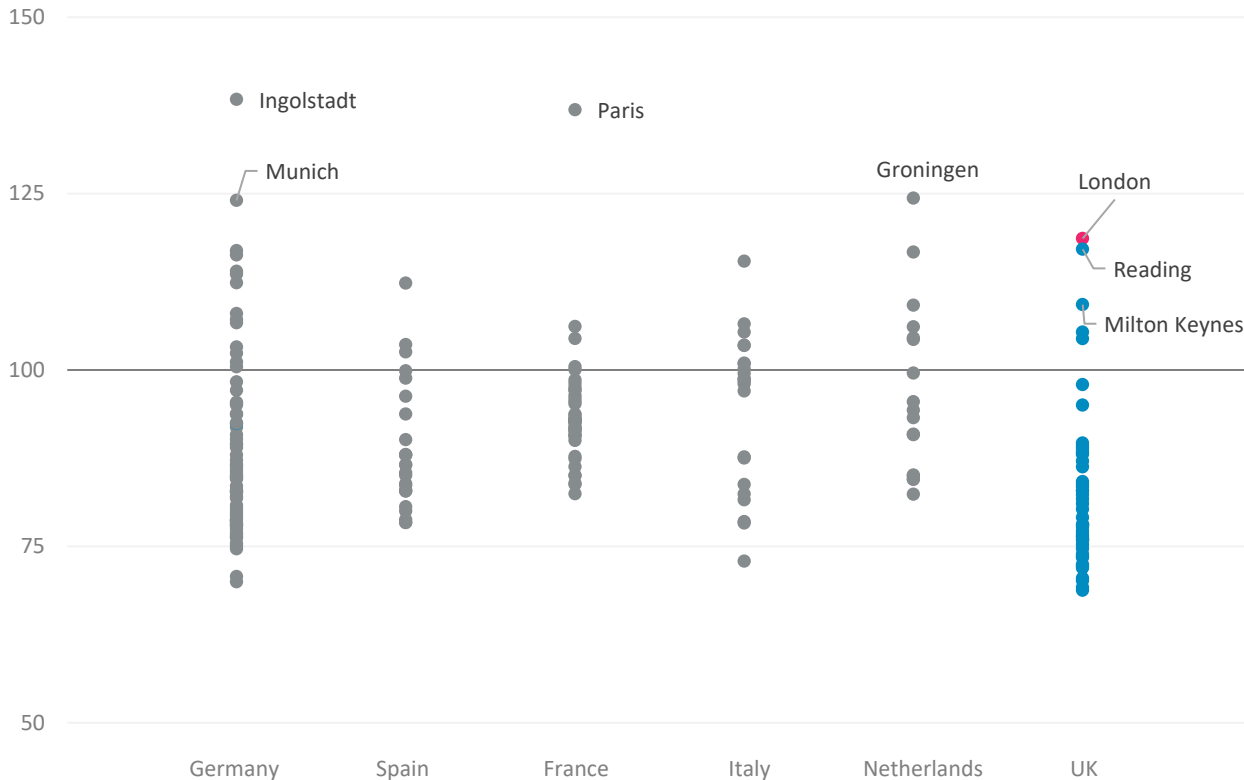
productivity in ways that are harder to foresee. Early signs of rising investment in labour-saving technologies¹⁰⁸, for example, would need to be weighed against the ongoing Brexit-related uncertainties; both the impact on current investment decisions, and the potential negative impacts of lower future sales growth and reduced economic openness in terms of trade or migration.¹⁰⁹

¹⁰⁸ Bank of England (2018) [Tight labour markets and self-service beer: is the productivity slowdown about to reverse?](#)

¹⁰⁹ Bank of England (2017) [Tracking the views of British businesses: evidence from the Decision Maker Panel](#)

Appendix A: Supporting data

A.1: GDP per worker, UK and selected European countries, 2015 (Index, UK = 100)



Source: OECD. Note: GDP divided by employment (place of work) expressed in US\$ constant prices (base year 2010)

A.2: Industry/size/age composition of local plants in the population and in the top 20% and bottom 20% of the productivity distribution, London, 2015

	Less Knowledge Intensive Services	Knowledge Intensive Services	Low-Medium Tech Manufacturing	Medium-High Tech Manufacturing	Other
Industry					
All - London	45%	38%	2%	0%	15%
Top 20% - London	11%	73%	0%	0%	15%
Bottom 20% - London	91%	2%	2%	0%	5%
Size	1 to 9	10 to 49	50 to 99	100 to 249	250 and over
All - London	82%	8%	1%	1%	7%
Top 20% - London	87%	6%	1%	1%	6%
Bottom 20% - London	65%	12%	2%	3%	18%
Age	Under 1	1 to 5	11 to 15	16 to 20	20 and over
All - London	15%	47%	11%	7%	20%
Top 20% - London	16%	50%	11%	7%	16%
Bottom 20% - London	11%	37%	11%	8%	33%

Source: ONS Annual Business Survey and Inter-Departmental Business Register. Notes: (i) data refers to the non-financial business economy only; (ii) knowledge-intensive services includes knowledge-intensive: high-tech services, market services and other services; medium-high tech manufacturing includes medium-high tech manufacturing and high-tech manufacturing; low-medium tech manufacturing includes low-tech manufacturing and medium-low tech manufacturing; other includes Construction, Real estate and Non-manufacturing production.

A.3: Exports and productivity by UK NUTS3 area

GVA per hour worked (2017)



Source: ONS Subregional productivity / Regionalised estimates of Great Britain service exports by NUTS3. Note: Labour productivity is based on nominal GVA (B) (excluding rental income) per hour worked: smoothed levels (£).

A.4: Household income and productivity by UK NUTS3 area

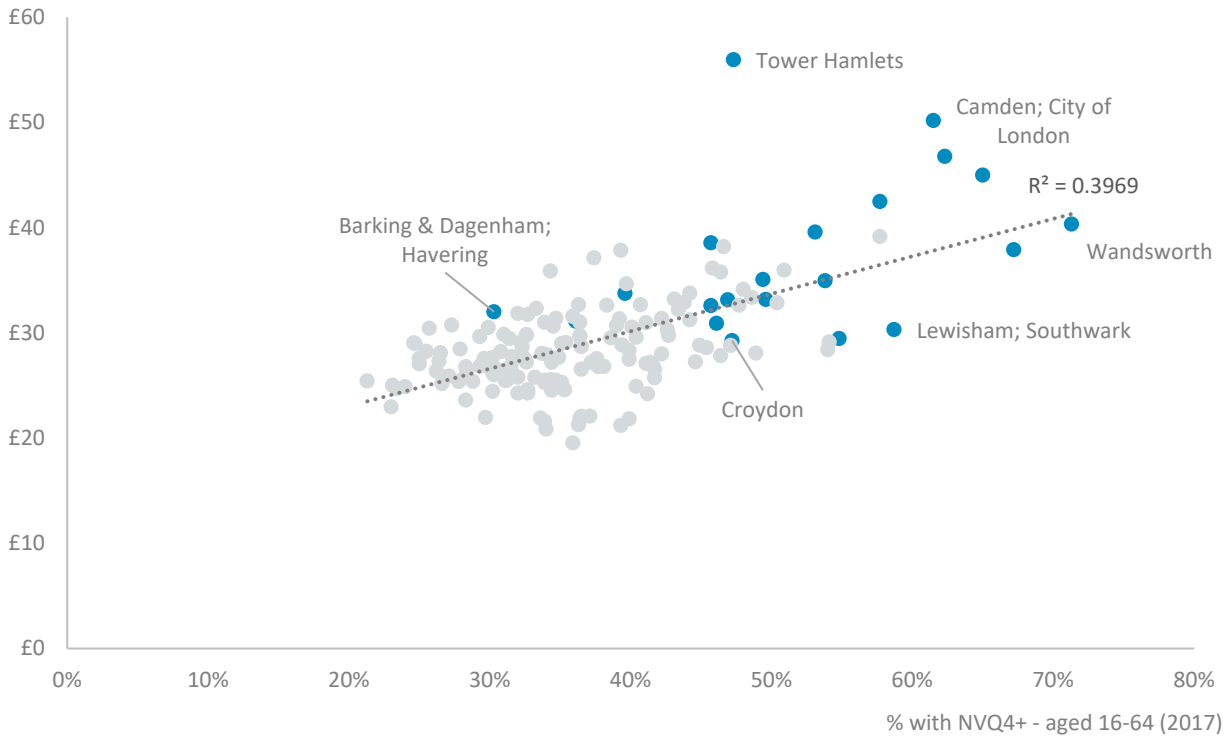
GVA per hour worked (2017)



Source: ONS Subregional productivity / Regional gross disposable household income. Note: Labour productivity is based on nominal GVA (B) (excluding rental income) per hour worked: smoothed levels (£).

A.5: Residents qualifications and productivity by UK NUTS3 area

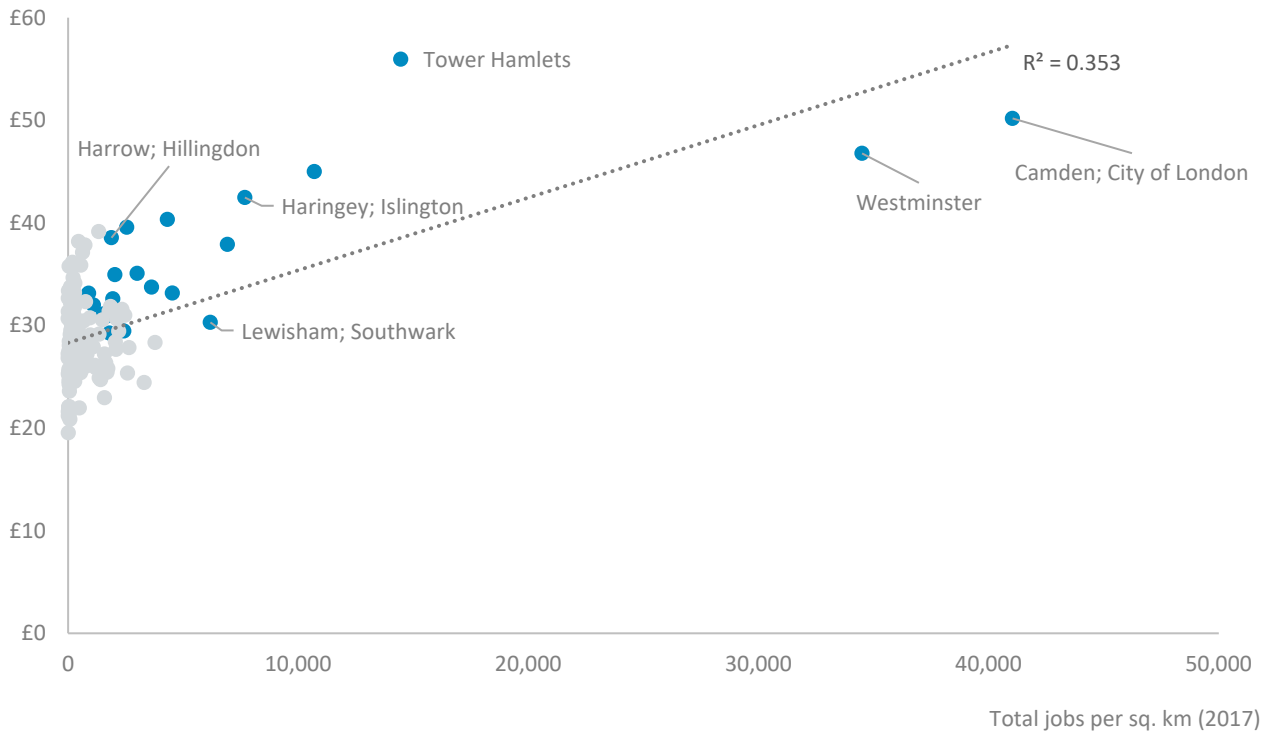
GVA per hour worked (2017)



Source: ONS Subregional productivity / Annual Population Survey. Note: Labour productivity is based on nominal GVA (B) (excluding rental income) per hour worked: smoothed levels (£).

A.6: Jobs density and productivity by UK NUTS3 area

GVA per hour worked (2017)



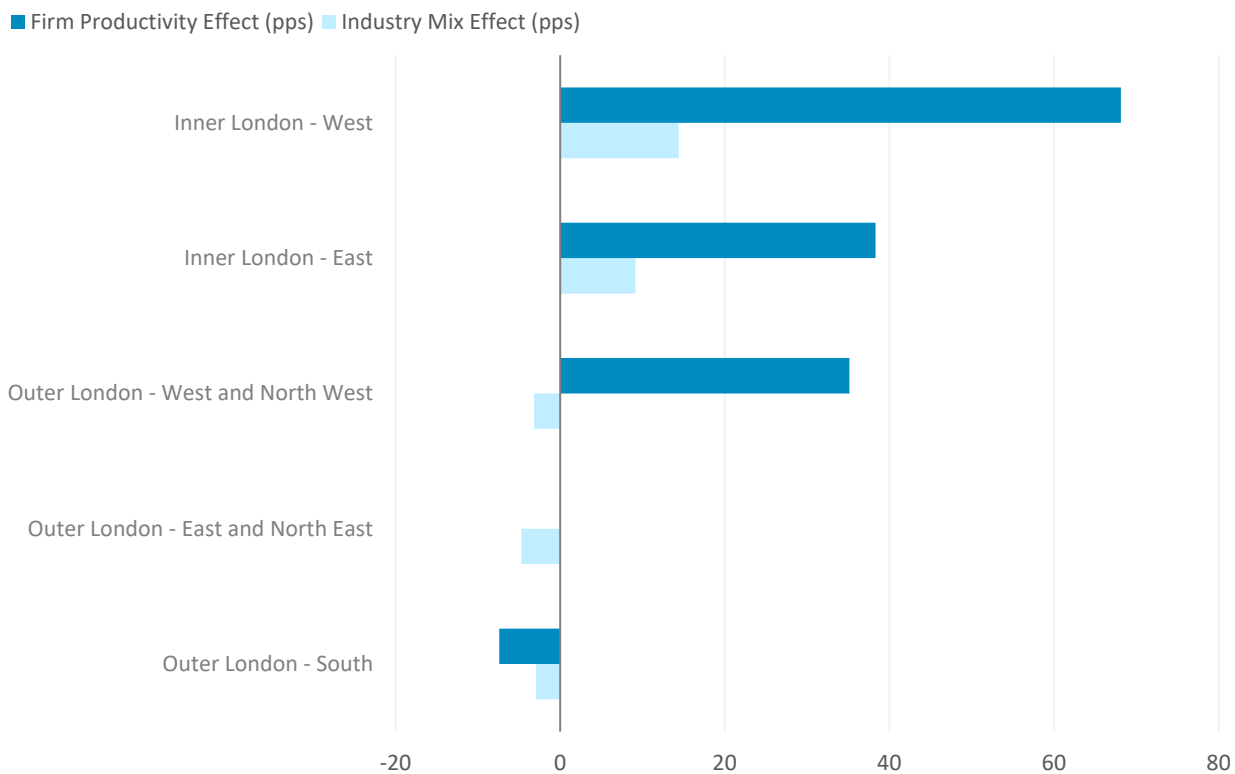
Source: ONS Subregional productivity / GLA Economics analysis of ONS Jobs Density. Note: Labour productivity is based on nominal GVA (B) (excluding rental income) per hour worked: smoothed levels (£).

A.7: Location quotients by broad industry groups, London NUTS2 areas, 2016

	Knowledge Intensive Services	Less Knowledge Intensive Services & Other KIS	Low-Medium Tech Manuf.	Medium-High Tech Manuf.	Other Production	Real Estate
Inner London - West	2.30	0.74	0.09	0.03	0.40	0.87
Inner London - East	1.87	0.87	0.20	0.04	0.58	0.97
Outer London - West & North West	1.25	0.90	0.58	0.19	0.83	1.48
Outer London - East & North East	0.52	0.96	0.62	0.98	1.30	1.84
Outer London - South	0.81	1.00	0.26	0.12	0.87	1.96

Source: Office for National Statistics. Note: A location quotient greater than 1.25 indicates a high level of relative specialisation of subregion (j) in industry (i), and location quotients below 0.75 indicate a low level of specialisation.¹¹⁰

A.8: Firm productivity and industry mix effects on aggregate average productivity, London NUTS2 regions, 2015



Source: ONS Annual Business Survey.¹¹¹ Note: (i) analysis excludes the finance, agriculture and public sector sectors.

¹¹⁰ ONS (2018) [Examining regional gross value added growth in the UK: 1998 to 2016](#)

¹¹¹ ONS (2018) [Regional firm-level productivity analysis for the non-financial business economy, Great Britain: April 2018](#)

Appendix B: Relationship of NUTS areas to London administrative geographies

The Nomenclature of Territorial Units for Statistics (NUTS) is a hierarchical classification of administrative areas, used across the European Union (EU) for statistical purposes. London is one of 12 NUTS 1 areas in the UK. It is broken down into the following categories:

B.1: NUTS areas in London

NUTS2 areas within London:	
Inner London – West	
Inner London – East	
Outer London – East and North East	
Outer London – South	
Outer London – West and North West	
These NUTS2 areas are divided into the following NUTS3 areas:	
Inner London - East	Haringey and Islington Hackney and Newham Lambeth Lewisham and Southwark Tower Hamlets
Inner London - West	Camden and City of London Kensington & Chelsea and Hammersmith & Fulham Wandsworth Westminster
Outer London – East and North East	Barking & Dagenham and Havering Bexley and Greenwich Enfield Redbridge and Waltham Forest
Outer London - South	Bromley Croydon Merton, Kingston upon Thames and Sutton
Outer London - West and North West	Barnet Brent Ealing Harrow and Hillingdon Hounslow and Richmond upon Thames
These NUTS 3 areas are divided into the following local authority areas:	
Haringey and Islington	Islington Haringey
Hackney and Newham	Hackney Newham
Lambeth	Lambeth
Lewisham and Southwark	Lewisham Southwark
Tower Hamlets	Tower Hamlets
Camden and City of London	Camden City of London
Kensington & Chelsea and Hammersmith & Fulham	Hammersmith and Fulham Kensington and Chelsea

Wandsworth	Wandsworth
Westminster	Westminster
Barking & Dagenham and Havering	Barking and Dagenham Havering
Bexley and Greenwich	Bexley Greenwich
Enfield	Enfield
Redbridge and Waltham Forest	Redbridge Waltham Forest
Bromley	Bromley
Croydon	Croydon
Merton, Kingston upon Thames and Sutton	Kingston upon Thames Merton Sutton
Barnet	Barnet
Brent	Brent
Ealing	Ealing
Harrow and Hillingdon	Harrow Hillingdon
Hounslow and Richmond upon Thames	Hounslow Richmond upon Thames

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