THE ECONOMY 2030 INQUIRY

SHAPING A DECADE OF CHANGE

Bridging the gap

What would it take to narrow the UK's productivity disparities?

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June 2022

Centre for Economic Performance

Resolution Foundation

Funded by Nuffield Foundation

Acknowledgements

We thank Torsten Bell, Anna Valero, Alex Beer, Stephen Machin, Gregory Thwaites and seminar participants at the Resolution Foundation and LSE Centre for Economic Performance for comments. We also thank Patricia Rice and Anthony Venables for sharing data on regional male employment during deindustrialisation with us. We also thank Jesse Kozler and Jack Leslie for assistance in verifying our analysis. All errors remain the authors' own.

Citation

If you are using this document in your own writing, our preferred citation is:

P Brandily, M Distefano, H Donnat, I Feld, H Overman and K Shah,

Bridging the gap: What would it take to narrow the UK's productivity disparities?,

The Resolution Foundation, June 2022

The Economy 2030 Inquiry

The Economy 2030 Inquiry is a collaboration between the Resolution Foundation and the Centre for Economic Performance at the London School of Economics, funded by the Nuffield Foundation. The Inquiry's subject matter is the nature, scale, and context for the economic change facing the UK during the 2020s. Its goal is not just to describe the change that Covid-19, Brexit, the Net Zero transition and technology will bring, but to help the country and its policy makers better understand and navigate it against a backdrop of low productivity and high inequality. To achieve these aims the Inquiry is leading a two-year national conversation on the future of the UK economy, bridging rigorous research, public involvement and concrete proposals. The work of the Inquiry will be brought together in a final report in 2023 that will set out a renewed economic strategy for the UK to enable the country to successfully navigate the decade ahead, with proposals to drive strong, sustainable and equitable growth, and significant improvements to people's living standards and well-being.

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Executive Summary

An economic strategy that helps the UK respond to change, and tackle stagnant living standards and weak productivity, will need to address stubborn spatial disparities in economic performance across the UK. Addressing these disparities requires a good understanding of their extent, causes and consequences. In this report, part of the Economy 2030 Inquiry being undertaken by the Resolution Foundation and the Centre for Economic Performance at the LSE, we outline what we know about disparities in productivity across the country, the factors which determine them and the changes that would be needed to reduce them.

UK spatial disparities in productivity are large and longstanding

UK spatial disparities in productivity are large. In 2019, London produced £76,000 of gross value added per job, more than twice that produced in Powys and Torbay. These spatial disparities are also persistent. London's productivity was 40 per cent above the national average in 2002 and 50 per cent in 2019. By contrast, Powys and Torbay were 20 per cent less productive than the average in 2002 and were 30 per cent less productive in 2019. Looking across the UK, few areas have seen large changes in their relative positions over the past twenty years. And, in contrast to disparities in income which have remained static, overall disparities in productivity increased slightly up to the end of the financial crisis although they have been broadly stable since. These changes are mostly due to a small number of the best-

performing areas pulling away and a handful of struggling areas falling even further behind.

In short, spatial disparities in productivity in the UK are large and persistent, and slightly larger than they were at the start of the 2000s – although these changes are small relative to the level of disparities that persist throughout the period. But although the gaps in productivity between UK areas are large, in the international context they are not as unusual as some headlines might have us believe, if we focus on an appropriate measure of productivity, broadly comparable areas, and reasonable comparator countries. But wherever one stands in this debate, resolving it will do little to advance our understanding of what is needed to narrow spatial disparities: 'Be like Germany' is not a sufficient basis on which to develop an economic strategy for the UK in the 2020s. Given the wide consensus that these gaps are large and undesirable, the debate instead needs to focus on understanding the underlying economic fundamentals that drive differences in productivity and what this means for policy.

The UK's services specialism is an underlying driver of its economic geography

The UK's economic geography has been fundamentally shaped by de-industrialisation and the rise of a services-led economy. The UK's specialisation in tradable services (i.e. services such as insurance and consulting, that can be traded across regions and exported abroad) is an important determinant of its spatial disparities because tradable services benefit strongly from agglomeration economies. As a result of these agglomeration economies, highly productive economic activity is more spatially concentrated in economies that specialise in high-skilled tradable services. The transition from manufacturing to services made it inevitable that we would see productivity gaps open up between areas, and this is what we see when we consider similarly services-oriented economies such as France. However, while some degree of disparity may be a consequence of the UK's specialisms, it was far from inevitable that we ended up with the scale of the gaps that the UK experiences today. Even though Paris has higher productivity than London, the stronger productivity of other French cities reduces the overall extent of disparities. While policy will never eliminate the productivity gaps that exist between UK

cities, towns, and villages, it could do more to address the weak performance of the UK's major cities outside of London.

The decline in manufacturing, starting in the 1970s, was exceedingly painful for industrial centres, including London. This pain endured long after the initial shocks ended in terms of lower employment rates for areas, including the West Midlands, Liverpool, and Sheffield, that had the biggest employment shocks. However, while the shocks have been somewhat persistent, the correlation between the initial employment shocks felt during the 1970s and employment rates at the start of 2000s is not that strong. There is no link between these initial employment shocks and productivity. Some areas – such as Southampton and York - successfully managed the transition to a more services-orientated economy; others – such as East Kent and Lancaster - did not. Many would argue that the transition could have been managed far better. To do better in the future, and to think about how we might narrow the UK's productivity disparities, we need to understand what explains these disparities today.

Four key factors help explain differences in area-level productivity: the size of the local economy (as measured by employment), levels of human capital (as measured by graduate share), and levels of physical and intangible capital. These factors account for up to 55 per cent of the spatial variation in productivity observed at the end of the 2010s. As the UK's specialism in high-value tradable services has grown so too has the importance of size and skills and the role of intangibles (such as research and development capital) and information and communications technologies (ICT) equipment. These changes are consistent with what we might expect given recent technological change favouring higher-skilled workers in an economy that is highly specialised in services.

Closing productivity gaps between London and the UK's other major cities will require significant investment and change

While the nature of the UK economy makes productivity gaps inevitable, narrowing the gaps between our major cities is possible. As well as improving the economic performance of those cities and their surrounding regions, narrowing these gaps could play a role in tackling the UK's productivity decline relative to other

developed countries. Given our specialisms, improving the UK's productivity means bigger high value-added services sectors, and a wider range of cities succeeding with them. Doing this means being honest about the scale of change required.

For example, increasing Manchester's size, graduate shares, and capital stocks by 30 per cent roughly halves the productivity gap between Manchester and London leaving Manchester with a productivity gap smaller than that between Lyon and Paris (20 per cent) and similar to that between Edinburgh and London (15 percent). These are large changes amounting to many tens of billions of pounds of investment, an eleven-percentage point change in graduate share and an increase in size of a little over 500,000 workers.

Far from all of this investment would need to be done by government. But the spatial disparities in each of these drivers are also highly persistent - as is the UK's specialisation in services - emphasising the limits of relying solely on the market to reduce these productivity gaps.

There are likely to be trade offs between improving national productivity and narrowing productivity disparities

Given the scale of the investment needed, any economic strategy will face difficult and important trade offs. First, it will need to grapple with whether, and how quickly, national productivity improves and spatial disparities narrow. Second, it will need to choose places to invest in most aggressively (since constraints mean not all places can be prioritised simultaneously).

For a more-or-less fully-employed economy like the UK's, increasing investment at anything more than a glacial pace will mean less consumption, or more overseas borrowing. This illustrates the difficult choices that a move to a higher investment path will entail. And such investment will be needed: French workers, for example, use over 40 per cent more capital than UK workers, enough to account for the whole gap in overall productivity with the UK. Would a more equal distribution of investment help or hinder this catch-up? It is not clear, although it seems likely that investment in the London metro area – a highly

productive area that accounts for 25 per cent of UK employment – to increase its productivity to levels seen in Paris, would play an important part in narrowing the gap between the UK and other countries.

This trade off could be avoided if the returns to investment are higher outside London. But even if government picks projects wisely, the scale of redistribution required means that at some point the country will face a trade off between high-return projects in more productive areas and lower-return projects elsewhere. How these choices get made will influence how quickly national productivity improves and spatial disparities narrow.

This is not just a story about London versus the rest. However, when thinking about where to invest, it is important to recognise the strong market forces that drive high productivity in our largest city. London's economic advantages stem from its concentration of human, physical and intangible capital and from its economic size, and these factors are self-reinforcing. London's economic strength also spills over to benefit towns and cities across the wider South-East. The large investments required to close productivity gaps will also need to be spatially targeted at cities to generate the high returns that arise from the self-reinforcing feedback loops that explain London's big productivity advantage.

The alternative is to spread investments around. These investments could improve productivity in any area. However, there are many small towns, investment in infrastructure and innovation is costly, and for towns the self-reinforcing effects of size, skills and capital are limited by the scale of the local economy. Of course, there will still be many projects that are worth pursuing outside our major cities, but a strategy that focuses too much on towns, rather than our major cities, will not scale up to produce large productivity improvements across lots of areas for lots of workers.

The Government's recent Levelling Up White Paper suggests that the government recognises the arguments for spatial concentration, with an explicit focus on globally competitive cities. But the small amounts of investment committed, the suggestion of a global city in each region and the political pressure to spread

spending around, means that the strategy is a long way from fully embracing this reality.

In addition to grappling with these trade offs, an economic strategy aimed at narrowing productivity disparities must consider who gains from the strategy. A more equal spread of investment and of graduates – and globally competitive cities outside of London and the South East – may help reduce spatial disparities and improve productivity in those cities and the surrounding areas, but it is no simple fix for improving outcomes for poorer households. To do this, complementary investments must make sure that poorer households can access the opportunities generated.

Major economic change may strengthen, not weaken, disparities

The coming decade of change – driven by Covid-19, Brexit and Net Zero – might change the balance of these economic forces. However, it would be dangerous to assume that these changes will do policy makers' job for them by inevitably reducing - rather than increasing – spatial disparities. For example, faced with a new trade environment following Brexit, large and productive firms based in London are showing signs of responding and adapting more successfully to trade barriers than their counterparts in less productive regions of the country – risking further polarisation and widening of gaps.

Policy makers need to be realistic about the economic forces at play in the UK, how they are evolving, and what are the likely consequences. Understanding these forces, and dealing with the resulting trade offs, will be key to developing a successful economic strategy that improves aggregate economic performance while offering a hard, but plausible, path to closing regional inequalities.

Section 1

Introduction

The efficiency with which economies use the resources available to them – the level of productivity – is one key determinant of a country's living standards. The UK's overall productivity is substantially below that of France, Germany, and the US according to OECD data. In 2019, GDP per hour worked in those countries was around 17 per cent higher than in the UK. An earlier Economy 2030 report – from which these figures are taken – highlights how years of underinvestment in business capital and research and development, and gaps in basic and technical skills are key to understanding this underperformance.[1]

Not only does UK productivity lag other OECD countries, but there are also substantial differences in productivity across different areas of the UK. Such disparities are concerning for three reasons. First, large spatial differences in productivity may have implications for the overall performance of the economy, especially when large parts of the economy significantly lag the most productive areas. Second, these differences in productivity might have further knock-on implications for disparities in income and living standards across areas. And third, the local effects of the major changes we will see in the coming decade will both depend on, and have implications for, these differences in productivity. For all these reasons, an economic strategy that helps the UK tackle stagnant living standards and weak productivity, while responding to the coming changes, will need to face the challenges raised by stubborn spatial disparities in economic performance across the UK.

Unfortunately, while the link between national productivity and living standards is well evidenced, the consequences of spatial disparities in productivity are less well understood. The debate is polarised when it comes to the implications of spatial disparities for overall economic growth. For some, it is obvious that spreading growth across the UK would make use of under-utilised resources. For others, London and the South East are key drivers of the UK economy, and government should focus on making

1 J Oliveira-Cunha et al., Business time: How ready are UK firms for the decisive decade?, Resolution Foundation, November 2021.

sure that they continue to perform well.[2] Which level of government plays the key role here is subject to similar debate: should central government retain control or should money and powers be devolved to stronger local government?[3]

Empirical evidence to distinguish between these different stories often relies on comparing different countries to see if those with lower spatial disparities and stronger local government have better or worse economic performance. Given a limited number of countries, and the myriad factors that explain differences in the extent of spatial disparities and national economic performance, it seems unlikely that such analyses will reach a definitive conclusion.

This pessimistic conclusion, however, does not reduce the importance of better understanding the extent, causes and consequences of productivity disparities and the changes that would be needed to reduce them.[4] In this report we aim to develop this better understanding. Our focus is deliberately narrow, examining the causes of our productivity disparities and the scale of the changes needed to narrow them. To that end, the remainder of the report is set out as follows:

- Section 2 identifies and quantifies the disparities in productivity across the UK, highlighting the key methodological challenges that need to be resolved to get a clear picture of them.
- Section 3 analyses how the gaps in the UK compare to similarly-sized comparator countries.
- Section 4 provides a framework for thinking through what determines these disparities and what it would take to narrow them.
- Section 5 discusses the implications of our findings for policy making in the 2020s.
- Section 6 concludes.

This report is the third in a trilogy which consider the economic geography of the UK. The preceding reports have considered income gaps between places across the UK[5] and the perspective of residents on local economic prosperity.[6]

2 The Economist, The British government's "levelling up" plans are oddly old fashioned, February 2022, highlights how the South East and London run a net fiscal surplus which is redistributed to other regions in the UK. The need to ensure that high-performing regions continue to generate growth is also acknowledged in Department for Levelling Up, Housing and Communities, Levelling Up the United Kingdom, 2022.
3 See pg.167 Department for Levelling Up, Housing and Communities, Levelling Up the United Kingdom, 2022. See also Centre for Cities, Written evidence, House of Lords Constitution Committee inquiry into Future Governance of the United Kingdom.
4 We do not consider the role of different levels of government in implementing the policies that would be needed to achieve these changes. A forthcoming inquiry report will consider the question of devolution to local government.
5 L Judge & C McCurdy, Income outcomes: Assessing income gaps between places across the UK, Resolution Foundation, 2022.
6 L Judge & D Tomlinson, All over the place: Perspectives on local economic prosperity, Resolution Foundation, 2022.

Section 2

Spatial disparities in UK productivity

UK spatial disparities in productivity are large. In 2019, London produced £76,000 of gross value added per job, more than twice that produced in Powys and Torbay. But, while these headline disparities are large, the worst-performing areas account for a small proportion of the total economy. So, although improving productivity in those areas might make a big difference to them, this is unlikely to do much for aggregate economic performance. In contrast, the sizeable disparities in productivity between London and most of the UK's other cities (Manchester and Bristol, for example, are 30 per cent less productive than London) have bearings for national economic performance and matter for large numbers of workers. It is these disparities which should be the most concerning for policy makers.

The UK's spatial disparities are also persistent. London's productivity was 40 per cent above the national average in 2002, and 50 per cent above in 2019. Powys and Torbay were 20 per cent less productive than the average in 2002 and 30 per cent less productive in 2019. Looking across the UK, few areas see large changes in their relative positions over the twenty years for which we have data.

And in contrast to disparities in income which have remained static, overall disparities increased slightly up to the end of the financial crisis, although they have remained broadly stable since. These changes are mostly due to a small number of the best performing areas pulling away and a handful of struggling areas falling even further behind. These changes are small relative to the disparities inherited in 2002 that persist throughout the period. Understanding the causes of these persistent disparities is key to considering what is needed to narrow them.

In this section, we look at the UK's spatial disparities in productivity. We start by introducing the key measurement concepts and data we use to capture these gaps. Next, we look at the size of these disparities, paying particular attention to the gaps between the UK's cities. Finally, we also consider how these gaps have changed over time.

Thinking carefully about geography is important when measuring spatial gaps in productivity

The amount of goods and services produced by an economy is a crucial determinant of the overall standard of living that its citizens can enjoy. Economic productivity measures how good an economy is at producing these goods and services given the resources available. Firms use different economic inputs – labour and human capital, such as education and skills, supplied by workers; physical capital, such as building and machines; and intangible capital, such as design, branding, R&D, and software – together with available technologies to produce these goods and services. In economic terms, productivity measures how much output can be produced from these available inputs.

One commonly used measure for comparing economies is labour productivity: the amount of output produced per worker (or per hour worked). We use a version of this measure – Gross Value Added (GVA) per job – to consider spatial disparities across the UK. In addition to being commonly used, one key advantage of this measure is that it is available from 2002 to 2019 for subnational areas of the UK – 179 so-called NUTS3 (now ITL3) or around 400 Local Authority districts.[7] This allows us to consider not only the extent of disparities, but also their persistence and whether disparities are growing over time.

Spatial differences in this measure will reflect differences in human, physical and intangible capital, as well as differences in total factor productivity (TFP) – the part of productivity that cannot be explained by measured inputs of human, physical and intangible capital. TFP differences may arise because firms use different technologies or organisational practices in different areas; it will also capture the way that area influences productivity. For example, firms and workers in a remote area such as the Isle of Skye are likely to be less productive than firms taking advantage of 'agglomeration economies' in big cities such as London and Manchester (see Box 3). The core part of our analysis in Section 4 aims to understand the role of differences in area size and in human, physical and intangible capital forms, to shed light on the causes of the spatial disparities that we document in this section.

As well as focusing on a particular measure of productivity, any analysis of spatial disparities must also decide what areas to compare. Economic research on spatial

7 See the data appendix for further details.

disparities emphasises the importance of thinking about different economic drivers and the spatial scale at which they operate. This is why, when thinking about earnings from the labour market, researchers often use Travel to Work Areas, a concept that attempts to group together places that are part of a common labour market.[8] But, when comparing productivity across areas, the central concept is of a functional urban area (FUA) tied together by flows of people and goods and services.

Using some type of FUA allows the researcher to account for the segmentation of production that takes place within local economies. For example, high productivity financial services are usually found spatially concentrated within big cities (e.g. in the City of London and Canary Wharf) while the lower productivity activities that support those services are more spread out. If we want to understand the internal spatial structure of different areas, then such detail is helpful – and the higher the spatial resolution of the data, the better. But if we want to understand what causes spatial disparities, say, between cities, or between cities and smaller areas, then the spatial units used for the analysis need to average out these internal spatial differences. This is why we use OECD definitions of metro areas, based on NUTS3 areas, that attempt to approximate FUAs with employment above a certain size. In the text, when it is unlikely to cause confusion, we use the terms 'cities' and 'metro areas' interchangeably, although we will always refer to 'metro areas' in the tables and figures. For non-metro areas we use data for the relevant NUTS3 region. This is not just an abstract issue: as we explain more in Box 1, artificially dividing functional areas into lots of smaller areas significantly overstates the extent of UK spatial disparities.[9]

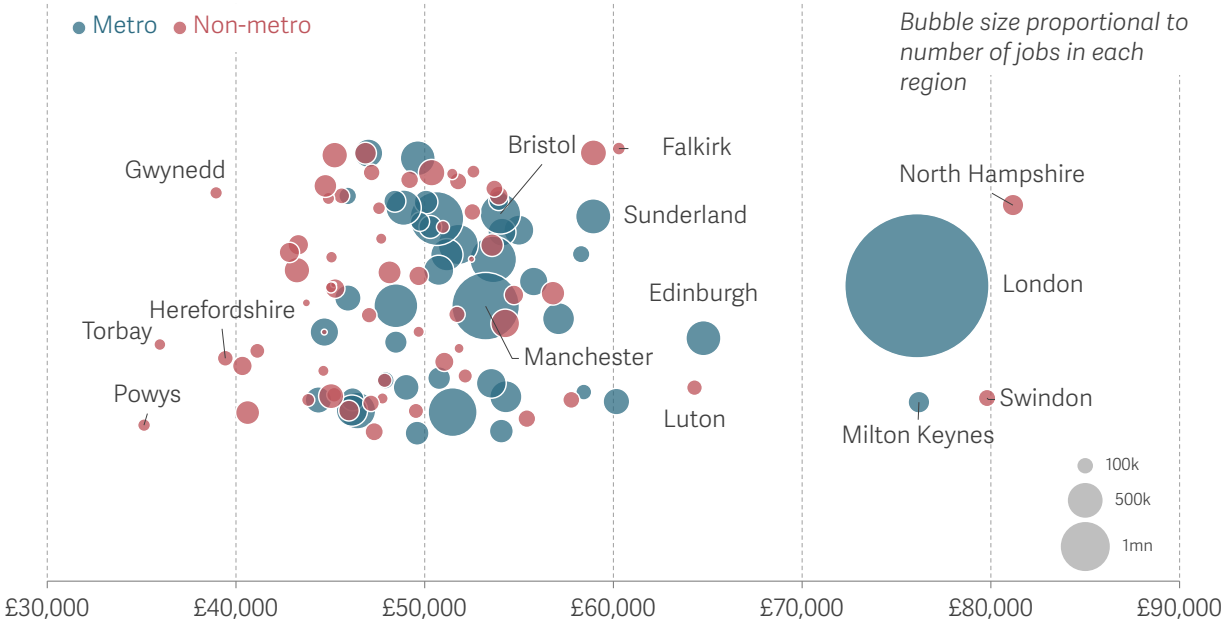
Spatial disparities in productivity are large

Figure 1 illustrates the extent of productivity disparities within the UK. These disparities are large. In four areas (London, Milton Keynes, North Hampshire, and Swindon) GVA per job was over £75,000 in 2019.[10] At the other extreme, four areas (Gwynedd, Powys, Torbay, and Herefordshire) had GVA per job of less than £40,000.

8 H Overman & X Xu, Spatial disparities across labour markets, IFS Deaton Review, 2022.
9 The data appendix provides further details.
10 The high GVA of Milton Keynes, North Hampshire (which includes Basingstoke) and Swindon is likely to partly represent a 'headquarters effect' where some of the GVA produced in other areas is allocated to headquarters based in these areas. The ONS uses multiple data sources to try to avoid such effects when constructing the GVA data, but it is likely that some measurement error of this kind occurs.

FIGURE 1: **Spatial disparities in productivity in the UK are large**

Gross value added per job, by area: UK, 2019



NOTES: GVA per job in 2019, calculated as gross value added divided by number of jobs by workplace. Spatial units are a combination of OECD metro areas and NUTS3 for non-metro areas.
SOURCE: Analysis of ONS, Subregional Productivity, July 2021.

Although these headline disparities are large, Figure 1 shows – by plotting the size of each bubble as proportional to the number of jobs in each area – that the London metro area, one of the best-performing areas, accounts for a large proportion (around 25 per cent) of the total jobs in the economy.[11] In contrast, the worst-performing areas account for a small proportion of the total economy: the workforce of the four poorest-performing areas is just under 285,000 (0.8 per cent of the workforce). Even the ten poorest-performing areas account for just under 1.3 million jobs, or around 4 per cent of total UK jobs. Improving productivity in those areas might make a big difference to those 1.3 million workers (depending on how it is done), but this is unlikely to do much for aggregate economic performance.[12]

On the other hand, it would be wrong to conclude from this discussion that the economic performance of London is the only aspect of these spatial disparities that has a bearing on our national economic performance. Figure 1 makes clear that there are sizeable disparities in productivity between London and most of the UK's other metro areas. And, unlike the gaps between the extremes of the productivity distribution, these

11 Note that this represents the employment of the whole functional area, as described in the text, and not just jobs based within the London boroughs. The London metropolitan area includes regions such as West Essex (which contains Epping and Thurrock) and West Surrey (including Guildford) which are not considered part of London in the ITL1 spatial taxonomy.
12 Even this might not necessarily translate into large increases in incomes in those areas, given that around 45 per cent of the population in Powys, Torbay, and Gwynedd are either retired or under the age of 19.

gaps matter for large numbers of workers: excluding London, these metro areas account for around 70 per cent of employment and value-added, and so their performance has significant implications for the aggregate economy.

After London and Milton Keynes, the third-most productive metro area – Edinburgh –is almost 15 per cent less productive than London, and Manchester – the second largest metro area by size of workforce – is about 30 per cent less productive than London. The disparities between non-London metro areas are less severe: the worst performing metro area of Kirklees, for example, is 17 per cent less productive than Manchester. The drop in economic performance between London and the country's other major cities is a key feature of the UK's economic geography. This suggests that understanding the reasons for their under-performance is crucial for understanding UK disparities; similarly, improving their performance will be key to driving deep economic gains.

BOX 1: **Choosing the right measure of productivity and appropriate spatial units**

Discussions of spatial disparities in the UK often suffer from two methodological problems: the choice of productivity measure and the choice of spatial unit.

Decisions about the appropriate productivity measure and the spatial units of analysis have significant implications for assessing the magnitude of spatial disparities in the UK. As discussed in the text, we use data on GVA per job as our productivity measure, and use the OECD metro definition to combine NUTS3 areas into metro areas and then use these metro areas plus the remaining non-metro NUTS3 as our basic unit of analysis.

Productivity measures: Using GVA per capita can be highly misleading. GVA is measured on a workplace basis – i.e. statistical agencies allocate output to the place where the work is done. In contrast, population is measured on a residential basis – i.e. statistical agencies allocate people based on where they live. If there are large commuting flows in and out of the most productive areas, then differences in GVA per capita mismeasure productivity differences. This problem is more pronounced for smaller spatial units. Consider the example of the NUTS3 region of Camden and City of London: in 2019, workplaces in this region generated £104 billion of gross value added. This output was produced by nearly 1 million workers, resulting in a GVA per job of around £105,000. However, the resident population of Camden and the City of London amounts to less than 280,000 people, meaning that GVA per capita for the region stands at an

inflated £374,000. We use GVA per job to measure productivity, rather than GVA per capita. Both GVA and jobs are calculated based on workplaces, so this avoids the measurement error created by commuting across area boundaries. Using GVA per job rather than GVA per capita lowers the coefficient of variation across UK NUTS3 areas by 80 per cent (from 1.15 to 0.21). We use GVA per job rather than GVA per hour worked because the latter is not available for Northern Ireland. In practice, both measures of productivity are highly correlated (in our sample, GVA per hour has a correlation of 0.98 with GVA per filled job).

Spatial units: The ONS often uses three sets of 'nested' administrative units to divide up the UK. The 12 largest regions are territorial level 1 or TL1. The 37 TL2 regions break up TL1 into smaller regions, and the 179 TL3 regions similarly break up TL2. Neither TL2 nor TL3 approximate the functional economic areas that should form the basis of cross-area comparisons, and this is a particular problem for London.[13] To avoid these problems, we use the OECD metro definition to combine NUTS3 areas into metro-areas and use these metro-areas as well as the remaining non-metro NUTS3 as our basic unit of analysis (see the data appendix for how these are defined and for further discussion).[14] This decision facilitates international comparisons, as we discuss further in Box 2.

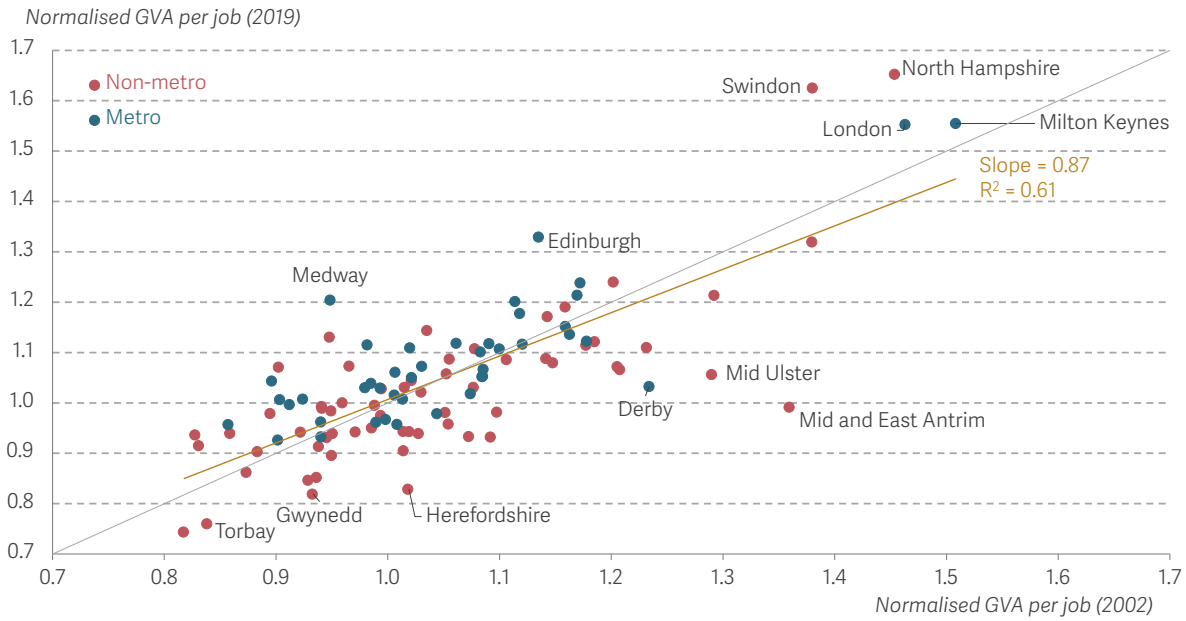
UK spatial disparities are persistent

The UK's spatial disparities in productivity have been highly persistent over the two decades for which we have data. Figure 2 shows this by plotting the productivity of areas (again measured by GVA per job) relative to the average productivity across all areas in 2002 against the same measure in 2019. A dot sitting on the 45-degree line has the same relative productivity in 2019 as it did in 2002; anywhere below the line is doing relatively worse, and anywhere above the line relatively better. The line of best fit through the data has a slope close to one, and many points fall close to the line, pointing to a strong degree of persistence in productivity disparities.

13 See the data appendix for further details.
14 For an outline of the OECD metro area definition see A Moreno-Monry, M Schiavina & P Veneri, Metropolitan areas in the world. Delineation and population trends, Journal of Urban Economics, 2021.

FIGURE 2: **Spatial disparities are persistent**

Normalised GVA per job, by area: UK, 2002 and 2019



NOTES: GVA per job is normalised by dividing the value for each area by the average across all areas for that year. Spatial units are a combination of OECD metro areas and NUTS3 for non-metro areas.
SOURCE: Analysis of ONS, Subregional Productivity, July 2021.

There are, however, several areas where this relationship does not appear to hold so strongly. Medway, for example, was underperforming the average level of productivity across areas in 2002, but by 2019 was outperforming the average; the opposite is true of Derby, and of Mid and East Antrim.

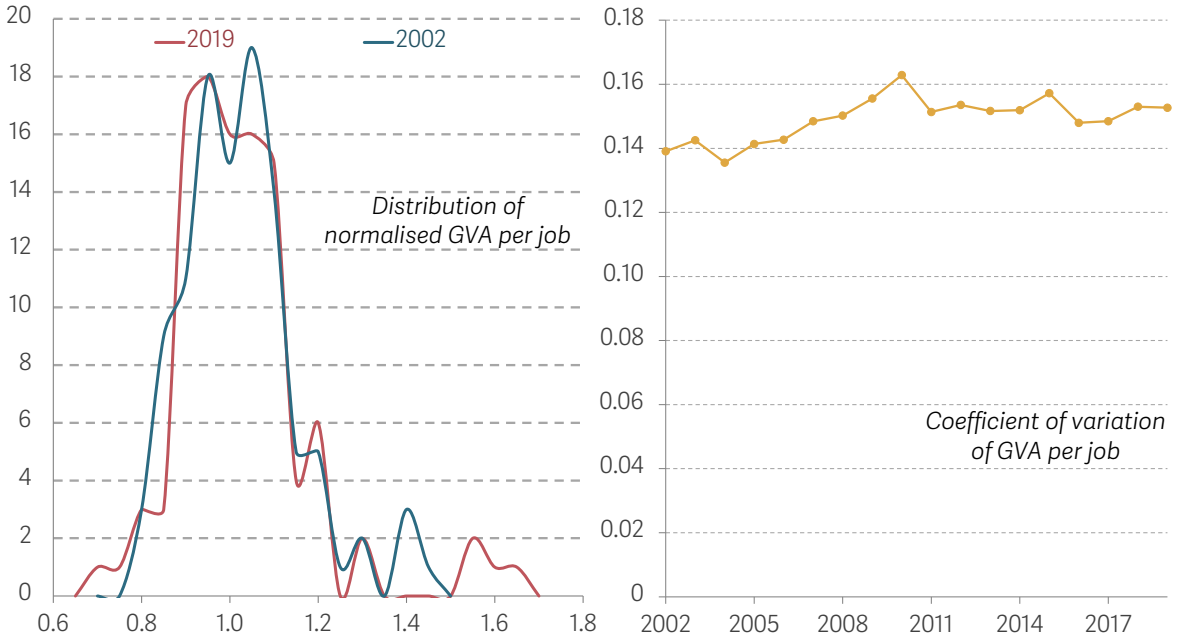
Disparities have grown moderately over time, driven by a handful of the best- and worst-performing areas

Although the relative positions of areas are quite persistent over time, Figure 3 illustrates that the gaps between the most productive and least productive areas have increased slightly over the past two decades. The left-hand panel shows the distribution of GVA per job at the area level relative to the average level of productivity across all areas in 2002 and 2019. Over time, the distribution has got wider, as a handful of the best-performing areas pulled away and some struggling areas fell even further behind. The right-hand panel uses a common measure of dispersion – the coefficient of variation – to summarise the spread using a single number for each year.[15] The coefficient of variation (see Box 2) grew from a value of 0.14 in 2002 to reach 0.16 in 2010, before falling to 0.15 by 2018. Disparities increased slightly up to the end of the financial crisis, although they have remained broadly stable.

15 The coefficient of variation is calculated as the ratio of the standard deviation of a variable to the mean, with a higher value indicating larger gaps between places.

FIGURE 3: **Spatial disparities in the UK have grown moderately over time as a handful of the best-performing areas pulled away and some areas fell even further behind**

Distribution of GVA per job across areas (left panel) and coefficient of variation of GVA per job (right panel): UK



NOTES: GVA per job is normalised by dividing the value for each area by the average across all areas for that year. The coefficient of variation is a measure of the dispersion of a variable and is calculated by dividing the standard deviation of a variable by its mean, with a higher value indicating larger gaps between places. Spatial units are a combination of OECD metro areas and NUTS3 for non-metro areas.
SOURCE: Analysis of ONS, Subregional Productivity, July 2021.

Once again, it is helpful to zoom in on the metro areas that account for nearly 80 per cent of workers. Repeating the analysis shown in Figure 3 but just for metro areas reveals that differences between metro areas are smaller than differences between areas as a whole, and they have also been stable across time even though London has pulled a little further away from the average metro area (it was 40 per cent more productive than the average metro area at the start of the period, 44 percent more productive by the end). The gap between London and other metro areas peaked in 2007, but has fallen recently as some metro areas reduced their disparity relative to the capital. For example, both Medway and Edinburgh reduced the gap in GVA per worker between them and London by 10 percentage points over the full period, and Brighton and Hove also caught up. The overall increase in disparities across all areas (and the year-to-year changes) shown in Figure 3 are driven by small, non-metro, areas that appear at the extremes of the productivity distribution.

This section has shown that, although disparities in productivity per worker across areas of the UK have increased over the last two decades, these are moderate changes, and they are driven by a handful of (mostly) small areas at the top and bottom of

the productivity distribution. The big picture is that any changes are small relative to the disparities inherited in 2002 and that persist throughout the period. The next section goes on to look at how the UK's spatial disparities in productivity compare to international counterparts.

Section 3

How does the UK compare to international counterparts?

We have seen that spatial disparities in the UK are large and persistent, and slightly larger than they were at the start of the 2000s – although these changes are small relative to the disparities that have persisted since. While the gaps in productivity between UK areas are large, in the international context they are not as unusual as some headlines might have us believe, if we focus on an appropriate measure of productivity, broadly comparable areas, and reasonable comparator countries.

For areas as a whole, a commonly used measure of disparities suggests that productivity disparities in the UK are not much higher than those seen in Germany and Italy. For metro areas – home to 77 per cent of UK jobs – when using the same measure, the UK is broadly in line with the level of disparities seen in France, Spain, and Italy, and has lower levels of disparities than seen in Germany.

The UK's specialisation in tradable services (i.e. services such as insurance and consulting, that can be traded across regions and exported abroad) is significant for the extent of the country's spatial disparities since tradable services benefit strongly from agglomeration economies. As a result of these agglomeration economies, highly productive economic activity is more spatially concentrated in economies that specialise in high-skilled tradable services. The transition from manufacturing to services made it inevitable that we would see productivity gaps open up between areas and this is what we see when we consider similarly services-oriented economies such as France. However, while some degree of disparity may be a consequence of the UK's specialisms it is far from inevitable that we ended up with the scale of the gaps that the UK experiences today. Even though Paris has higher productivity than London, the stronger productivity of other French cities reduces the overall extent of

disparities. While policy will never eliminate the productivity gaps that exist between UK cities, towns, and villages, it could do more to address the weak performance of the UK's major cities outside of London.

In this section, we look at how the UK's spatial disparities in productivity compare to those in other similar countries. We start by introducing the methodological issues which make such comparisons difficult. Next, we look at how productivity gaps vary in size between the UK and several comparable European countries. Finally, we point to common characteristics which explain the nature of productivity gaps across these countries.

The UK's spatial disparities are not as unusual as they may seem

We have argued that it is easy to overstate the extent of spatial disparities by using the wrong measure of productivity or inappropriate spatial units (see Box 1). Similarly, in the international context they are not as unusual as some headlines might have us believe, if we focus on an appropriate measure of productivity, broadly comparable areas, and reasonably comparable countries.

BOX 2: **Methodological issues – Appropriate spatial units and comparison countries matter more than the choice of dispersion measure**

Box 1 explained the methodological issues arising from the choice of productivity measure and the spatial unit used for the comparison. These considerations also matter for international comparisons because the size of TL3 regions varies widely across countries depending on how administrative boundaries are drawn. For example, the UK has 179 TL3 regions, the second largest in the OECD. In contrast France has 96 TL3 regions and Spain has 59. Most importantly, the UK is unique in that its most productive city, London, is split into more than 20 separate TL3 regions. Box 1 already discussed how big an impact this has on measures of UK spatial disparities (it increases the coefficient of variation by a factor of 6). To reduce the extent of these problems we use GVA per job and the same OECD metro and non-metro area classification to make our international comparisons.

Care is also needed in the choice of comparator countries to avoid comparisons across countries that are very different in terms of either geography or population. For example, cross OECD comparisons – common

in the literature – compare the UK to smaller countries such as Belgium and the Netherlands, as well as to larger countries such as the US. They also compare the UK to countries at different levels of economic development. These comparisons do not make much sense as the economic forces that drive spatial disparities within a small area, at the continental scale, or at different levels of development can be quite different. We look at the UK's position relative to Germany, Italy, France, and Spain - four European neighbours that are relatively similar in terms of scale, population, and level of economic development.

One final methodological issue is the choice of measure used to summarise the distribution. The main text focuses on the coefficient of variation which considers the spread of the whole distribution. As is widely recognised, the ranking of countries depends on the measure used. However, as Table 1 shows, despite the attention this has received it is a second order issue compared to the choice of an appropriate productivity measure and appropriate spatial units. The table reports result using alternative measures (the coefficient of variation, an employment-weighted dispersion measure and the 90/10 and 80/20 ratios) for three different sets of spatial units. When using NUTS3 spatial units (which suffer from the problem discussed above) the UK comes out top on every measure. However, using more appropriate spatial units, the differences between the UK and Germany and France narrow markedly and the spatial gaps are less unusual.

TABLE 1: **Appropriate spatial units matter more than the choice of dispersion measure**

Measures of spatial disparities in GVA per worker across different spatial units, by country: 2018

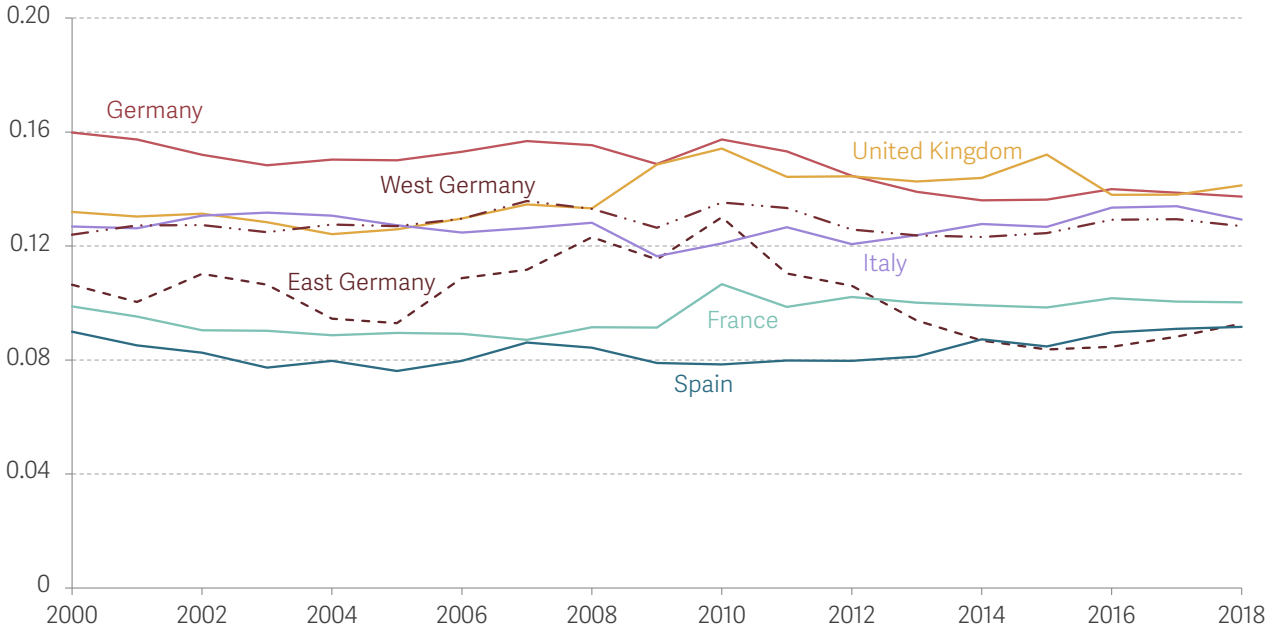
	NUTS3				Metro & Non-metro				Metro only			
	CV	Dispersion	90/10	80/20	CV	Dispersion	90/10	80/20	CV	Dispersion	90/10	80/20
United Kingdom	0.21	0.18	1.55	1.30	0.14	0.17	1.35	1.20	0.12	0.18	1.29	1.16
France	0.17	0.17	1.28	1.17	0.10	0.17	1.21	1.16	0.10	0.17	1.19	1.10
Spain	0.09	0.09	1.27	1.16	0.09	0.09	1.27	1.16	0.11	0.09	1.34	1.22
Germany	0.18	0.15	1.41	1.24	0.14	0.14	1.38	1.23	0.16	0.14	1.45	1.29
Italy	0.13	0.11	1.41	1.28	0.13	0.11	1.41	1.27	0.12	0.09	1.34	1.25

NOTES: GVA per worker is used to compare across European economies, as jobs (which includes the self-employed) data is not available. Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas. Foreign and extra-regio territories have been dropped. Measures shaded red, i.e. those with a higher value, are those where the country is ranked most spatially unequal among the comparator group of countries.
SOURCE: Analysis of OECD Regional Economy Database.

Figure 4 compares disparities by plotting the coefficient of variation in GVA per worker across all areas in the UK against those for France, Germany, Italy, and Spain and over time (see Box 2 for an explanation of why these countries). Spatial disparities in the UK are not much higher than those seen in Germany and Italy. One concern with this observation is that a lot of the variation for Germany could be driven by differences between East and West Germany. However, separating these out suggests that this is not the case – the extent of disparities across areas in West Germany are broadly like those seen in the UK.[16] Disparities in West Germany, Italy and Spain have also been stable over time - the overall reduction for Germany reflects the remarkable catch-up between East and West Germany. In contrast spatial disparities in France and the UK have risen over the last twenty years.

FIGURE 4: **The UK is more unequal than Spain and France, but has similar inequalities to Germany and Italy**

Coefficient of variation of GVA per worker across areas, by country



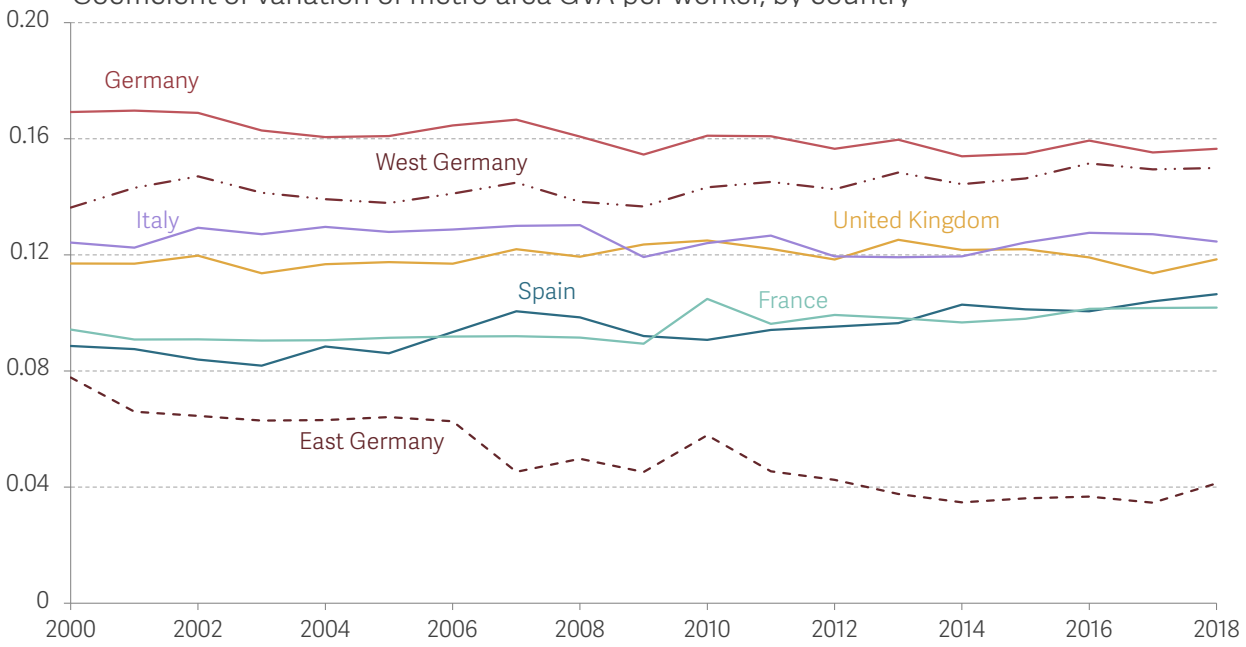
NOTES: GVA per worker is used to compare across European economies, as jobs (which includes the self-employed) data is not available. Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas. Foreign and extra-regio territories have been dropped.
SOURCE: Analysis of OECD, Regional Economy Database.

Once again, these headline figures disguise important differences for metro areas. Figure 5 plots disparities across metro areas for the same set of countries. It is striking that for these metro areas – home to 77 per cent of UK employment – disparities are constant over the time-period and the UK has disparities that put it in the middle of the four comparator countries.

16 Berlin metro is assigned to West Germany.

FIGURE 5: **The UK is middling for disparities across its metropolitan areas**

Coefficient of variation of metro area GVA per worker, by country



NOTES: GVA per worker is used to compare across European economies, as jobs (which includes the self-employed) data is not available. Spatial units are OECD metro areas. Foreign and extra-regio territories have been dropped.
SOURCE: Analysis of OECD, Regional Economy Database.

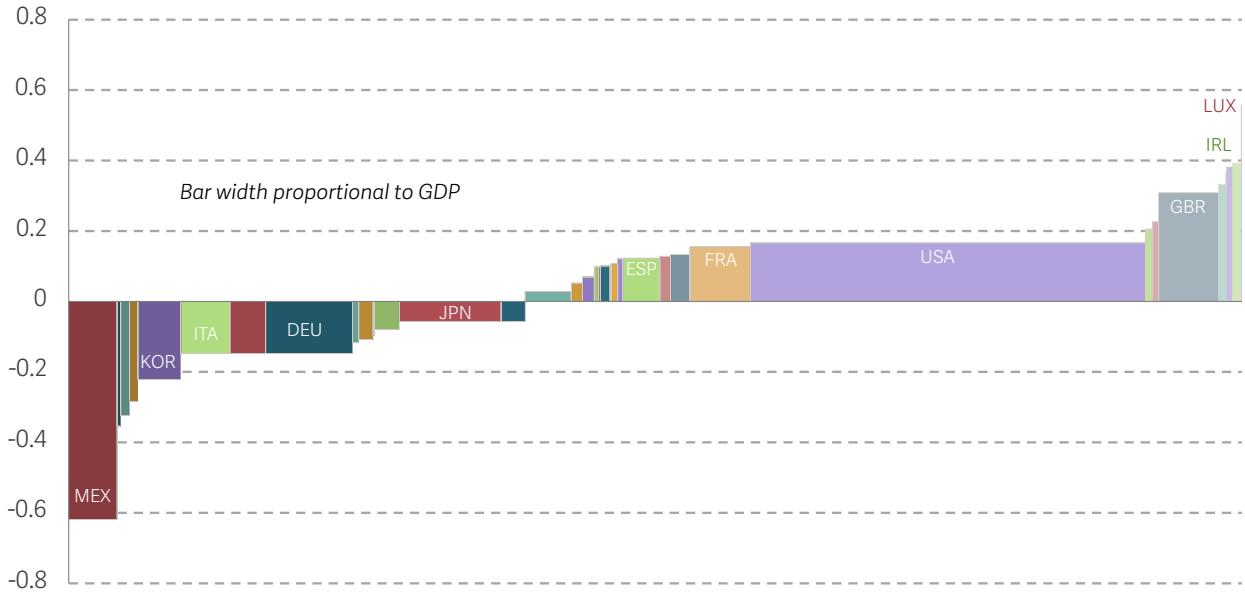
Economic activity tends to be more spatially concentrated in economies specialised in tradable services

As shown in Table 1 in Box 2, this picture changes if areas are weighted by employment. When we do this, disparities in the UK and France are considerably above those seen in the other three comparator countries. What explains these differences? As we've shown elsewhere in the Inquiry, the UK is specialised in tradable services (i.e. services such as finance and consulting, that can be traded across regions and exported abroad), and this international strength has grown over time.[17] In the 1980s roughly one quarter of the UK's total exports were services and by 2019 this had grown to 47 per cent, while over the same time-period services increased from 13 per cent to 24 per cent of total world exports. In value-added terms (accounting for the fact that some inputs to goods and services are imported), services represented nearly 70 per cent of UK exports in 2019. The UK is the largest developed economy to be as heavily weighted towards services relative to the overall picture in global trade. Figure 6 highlights just how large this specialisation is relative to OECD countries using the measure of revealed comparative advantage. Of comparator economies of a similar size France and Spain both have a services tilt (albeit a smaller one than the UK's), while Italy and Germany are both specialised in exporting goods.

17 J De Lyon et al., Enduring strengths: Analysing the UK's current and potential economic strengths, and what they mean for it's economic strategy, at the start of the decisive decade, Resolution Foundation, 2022.

FIGURE 6: **The UK is heavily specialised in tradable services**

Revealed comparative advantage in services, by country: 2019



NOTES: Vertical axis measures a country's RCA in services, with a positive number meaning the country is specialised in services.
SOURCE: Analysis of Harvard Growth Lab, Atlas of Trade Complexity; OECD-WTO, Balanced Trade in Services; IMF World Economic Outlook 2022.

The UK's services specialisation is significant for the extent of its spatial disparities since tradable services industries exhibit strong agglomeration economies (see Box 3).[18] As a result of these agglomeration economies, we should expect highly productive economic activity to be highly spatially concentrated in economies specialised in tradeable services. Figure 7 shows that the spatial economies of UK and France – both highly specialised in services – are characterised by having economic activity concentrated in a single large and highly productive metro area, while other smaller metro areas lag in terms of productivity. As we move down the chart, we move from countries specialised in services to countries specialised in manufacturing and the primacy of the most productive city falls noticeably. Germany, which is more specialised in manufacturing (that exhibits smaller agglomeration economies than high-skilled services) has a number of smaller metro areas which all perform strongly on an international basis.

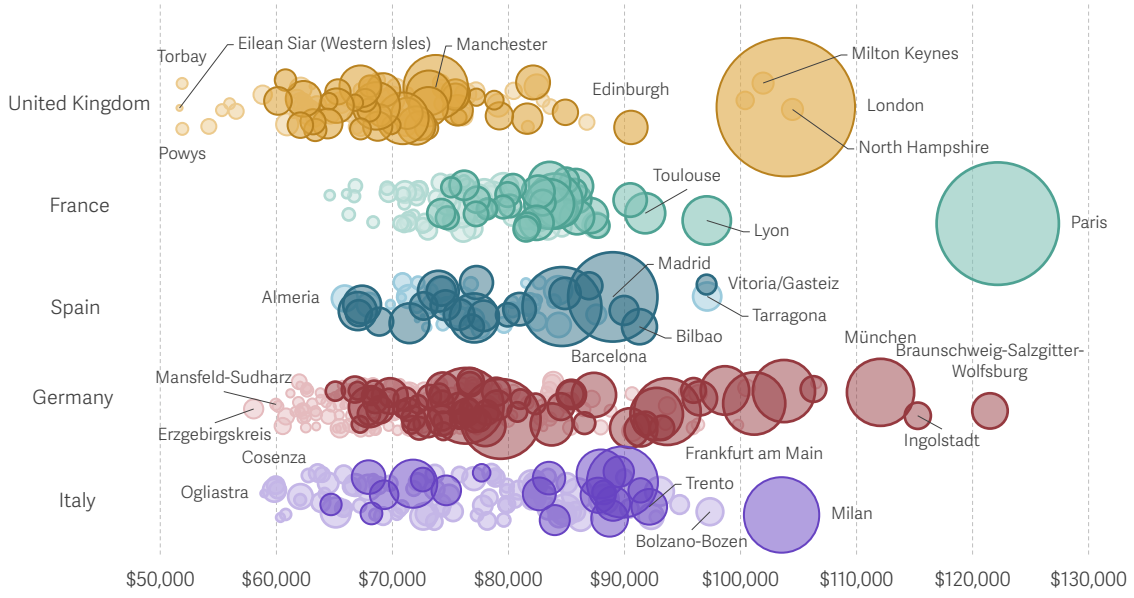
18 For the US, Eckert et al. (2021) find that all of the urban bias in wage growth is accounted for by the growth of high-skilled tradable services. Those services are historically more concentrated in the larger cities (Eckert, 2019). Estimates for the UK confirm that the 3 industries that benefit the most from localisation economies - Business and management consultancy activities" (SIC 7144), "Computer and related activities" (SIC 72), "Advertising" (SIC 744) - are tradable services (Graham, 2009). F Eckert, Growing Apart: Tradable Services and the Fragmentation of the U.S. Economy, working paper, 2019. F Eckert, Skilled Scalable Services: The New Urban Bias in Economic Growth, Minneapolis Fed, OIGI WP 25, 2020. D Graham, Identifying urbanisation and localisation externalities in manufacturing and service industries, Papers in Regional Science, vol 88, n 1, March 2009.

BOX 3: **Agglomeration Economies**

A large research literature points to the existence of agglomeration economies – the catch-all term that economists use to describe the productivity benefits generated by large local economies.[19] Large concentrations of firms and workers can help finance the fixed costs of shared resources (such as infrastructure) that increase the productivity of everyone working in the area. A good example would be the London Underground or the Manchester Metrolink. In large areas, firms and workers also benefit from large labour markets. This supports the division of labour. Examples include specialised legal and accounting services available in big cities. Large labour markets also allow for better 'matching' between firms and workers arising from an increase in the range of jobs available and of workers to fill them. Finally, spatial proximity facilitates learning which improve technologies and organisational structures, in turn increasing productivity. Silicon Valley's decentralised but cooperative production system provides one of the more famous examples.[20]

FIGURE 7: **Economic activity in France and the UK is concentrated in a small number of large, productive metro areas**

GVA per worker (PPP adjusted), by country and area: 2018



NOTES: 2018 levels of GVA per worker across areas for our set of comparator countries (adjusted to allow for comparability across different currencies). Metro areas are shown in darker bubbles. Foreign and extra-regio territories have been dropped. Bubbles proportional to number of workers in each area.
SOURCE: Analysis of OECD Regional Economy Database.

19 G Duranton & D Puga, Micro-Foundations of Urban Agglomeration Economies in Handbook of Urban and Regional Economics, Vol 4. Edited by J Vernon Henderson, J Thisse, 2004; P Combes & L Gobillon, The Empirics of Agglomeration Economies in Handbook of Urban and Regional Economics, Vol 5. Edited by G Duranton, J Vernon Henderson, W Strange, 2015.

20 A Saxenian, Regional advantage: Culture and competition in Silicon Valley and Route 128, Harvard University Press, 1996

A services-versus-manufacturing story is, of course, too simplistic alone. The transition from manufacturing to services made it inevitable that we would see productivity gaps open up between areas. However, while some degree of disparity may be a consequence of the UK's specialisms, it is far from inevitable that the UK ended up with the scale of the gaps seen today. Even though Paris has higher productivity than London, the stronger productivity of other French cities reduces the overall extent of disparities. While policy will never eliminate the productivity gaps that exist between UK cities, towns, and villages, it could do more to address the weak performance of the UK's major cities outside of London.[21]

Wherever one stands in the debate on the exceptionalism of the UK's productivity disparities, resolving it will do little to advance our understanding of what is needed to narrow those disparities. 'Be like Germany' is not a sufficient basis on which to develop an economic strategy for the UK. Given the wide consensus that these gaps are large and undesirable, the debate instead needs to focus on understanding the underlying economic fundamentals that drive differences in productivity and what this means for policy. In the next section, we make a start on this by considering what explains differences in area level productivity and why disparities have persisted over time.

21 This is one of the key issues highlighted in the Government's Levelling-Up White Paper. Department for Levelling Up, Housing and Communities, Levelling Up the United Kingdom, 2022.

Section 4

What drives the UK's spatial disparities?

The UK's economic geography has been fundamentally shaped by de-industrialisation and the rise of a services-led economy. The decline in manufacturing, starting in the 1970s, was exceedingly painful for the most exposed places, including London. This pain endured long after the initial shocks ended in terms of lower employment rates for areas, including the West Midlands, Liverpool and Sheffield, that had the biggest employment shocks. However, while the shocks have been somewhat persistent, the correlation between the initial employment shocks felt during the 1970s and employment rates at the start of 2000s is not that strong. There is no link between these initial employment shocks and productivity. Some areas – such as Southampton and York - successfully managed the transition to a more services-orientated economy, others – such as East Kent and Lancaster - did not. To better manage future shocks and transitions, and think about how we might narrow the UK's productivity disparities, we need to understand what explains these disparities today.

We show that as the UK's specialism in high value tradable services has grown, so too has the importance of the size of the local economy, the human capital of the local workforce and the total capital stock. While the nature of the UK economy makes productivity gaps inevitable, closing gaps between our major cities is possible. However, closing these gaps will require significant investment and change. For example, increasing Manchester's size, graduate shares, and capital stocks by 30 per cent roughly halves the productivity gap between Manchester and London leaving Manchester with a productivity gap smaller than that between Lyon and Paris (20 per cent) and similar to that between Edinburgh and London (15 percent). These are large changes amounting to many tens of billions of pounds of investment, an eleven-percentage point change in the graduate share and an increase in size of a little over 500,000 workers. And the persistence in the disparities of these factors suggests that the market alone will not deliver this change.

In this section, we look at the drivers of the UK's spatial disparities in productivity. We start by exploring the spatial impacts of the shock of de-industrialisation. We then look at which factors explain the disparities we see in the economy today and to what extent increases in size, human, physical and intangible capital could help to close gaps between places. We end by looking at how the spatial distribution of these factors has changed over the recent past.

De-industrialisation and the shift to services is crucial to the story of the UK's spatial disparities

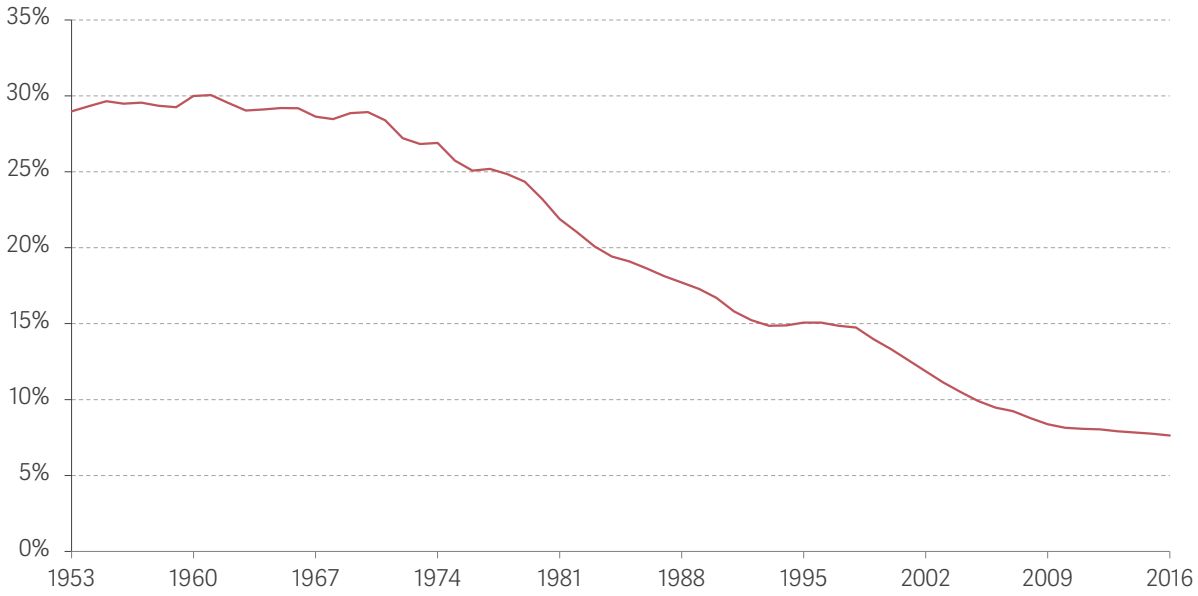
There is broad agreement that the UK's economic geography has been fundamentally shaped by de-industrialisation and the rise of a services led economy.[22] Up until around 1970, productivity disparities were narrowing across the UK.[23] This changed with the dramatic falls in manufacturing employment that the UK, and many other industrialised countries, experienced since the 1970s. Figure 8 shows that UK employment in manufacturing was reasonably stable in the 1950s and 1960s, at a little under 30 per cent of total employment. Beginning in 1970 manufacturing employment fell from 28 per cent to 22 per cent by 1980, by another 6 percentage points in the 1980s and continued to decline by 4 percentage points per decade to reach 8 per cent by 2015. These changes reflected two interlinked structural changes. First, manufacturing employment fell victim to manufacturing's productivity miracle, namely the sector's ability to produce goods increased much faster than demand with the result that employment in 'production' collapsed. Second, manufacturing employment also got competed away by international trade.

While de-industrialisation represented the largest shock, it was not the only structural change that served to widen disparities during this period – changes in functional specialisation also played a role.[24] At the peak of manufacturing prosperous cities were specialised in key manufacturing sectors and vertically integrated – i.e. headquarters and production plants were in the same place. Changes in telecommunications, transportation, and firm management practices made it possible to operate many things from a distance. This led to a separation of 'production' and 'management' (headquarters, business services, innovation, etc.) leading in turn to 'management and innovation' cities and 'production' cities. As manufacturing fell victim to its productivity miracle and the challenges of international competition, this functional specialisation added to the woes of the losers and to the gains of the winners.

22 R Martin et al., Levelling up Left Behind Places, Routledge, 2021; and P Rice & A Venables, The persistent consequences of adverse shocks: how the 1970s shaped UK regional inequality, Oxford Review of Economic Policy, Vol. 37, 2021.
23 Based on data for GDP per worker for NUTS 1 regions. See Figure 1 in R Zymek & B Jones, UK Regional Productivity Differences: An Evidence Review, Research Paper for the Industrial Strategy Council, 2020.
24 See G Duranton & D Puga, From Sectoral to Functional Urban Specialisation, Journal of Urban Economics, 2005.

FIGURE 8: **The UK economy has deindustrialised over the past half-century**

The share of manufacturing in total employment: UK



NOTES: The manufacturing employment share is the ratio of manufacturing employment to total employment.
SOURCE: Bank of England Millennium of Macroeconomic Data.

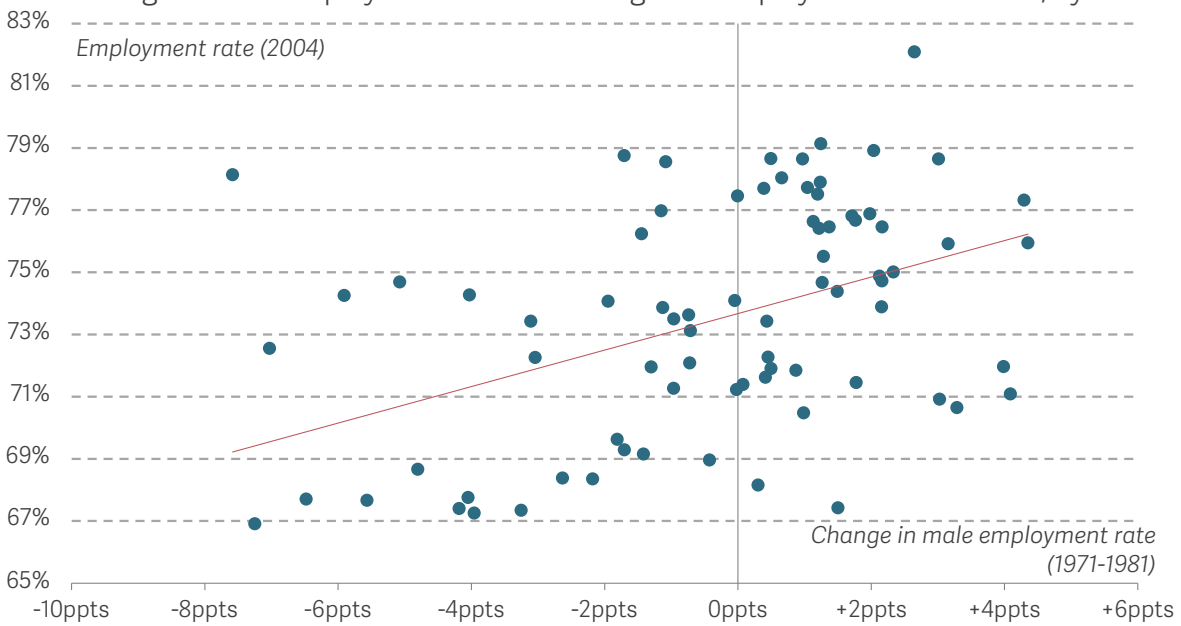
The lack of area-level data on manufacturing employment in the period before de-industrialisation makes it difficult to study the effects of these shocks directly.[25] Rice and Venables use male employment rates as a proxy and show that some areas saw their rates fall by 5–10 percentage points between 1971 and 1981.[26] For employment, the resulting increases in disparities persisted at least until 2011 (the point at which Rice and Venables end their analysis). Data on GDP per capita for the broad regions of the UK (so called NUTS1) also reflect the spatial effects of deindustrialisation.[27] For example, GDP per capita in the West Midlands – a region heavily reliant on manufacturing – went from 3 per cent above the UK average in 1971 to 9 per cent below in 1981. By 1996, it was still 7 per cent below the national average.[28]

De-industrialisation was exceedingly painful for places, including London, which lost substantial manufacturing bases. And as shown in Figure 9 – which plots employment rates in 2004 against the change in male employment rates from 1971 to 1981 - this pain endured in terms of lower employment rates for areas that had the biggest employment shocks long after the initial shocks ended.

25 Data on manufacturing employment at an appropriate spatial scale is only available from 1981 onwards, so after the biggest de-industrialisation shocks had already hit the economy.
26 P Rice & A Venables, The persistent consequences of adverse shocks: how the 1970s shaped UK regional inequality, Oxford Review of Economic Policy, Vol. 37, 2021.
27 GDP per capita is not so problematic as a measure of productivity at broad spatial scales because areas will be quite self-contained in terms of in and out-commuting (although this does ignore the fact that employment rates and dependency ratios might differ considerably across regions).
28 H Overman & X Xu, Spatial disparities across labour markets, IFS Deaton Review, 2022.

FIGURE 9: **De-industrialisation shocks experienced in the 1970s help explain differences in employment rates at the start of the 2000s**

Change in male employment in the 1970s against employment rate in 2004, by area: UK



SOURCE: Analysis of data from P Rice & A Venables, The persistent consequences of adverse shocks: how the 1970s shaped UK regional inequality, Oxford Review of Economic Policy, Vol. 37, 2021; ONS, Annual Population Survey.

However, while the shocks in employment rates have been somewhat persistent, many areas successfully managed the transition to a more services orientated economy. Some areas that saw large employment shocks in the 1970s had relatively high employment rates by the start of the 2000s.[29] In contrast, other areas that rode out the shocks of the 1970s, were themselves experiencing relatively poor employment rates by the start of the 2000s. In Figure 9 this is reflected in the relatively small slope and large variation around the fitted line (the R-squared is 20 per cent).

The picture is even more striking for productivity. As Figure 10 shows, by 2004 there was no link between the shocks felt during the 1970s and the productivity of areas. Some areas – such as Southampton and York - successfully managed the transition to a more services orientated economy, others – such as East Kent and Lancaster - did not.[30]

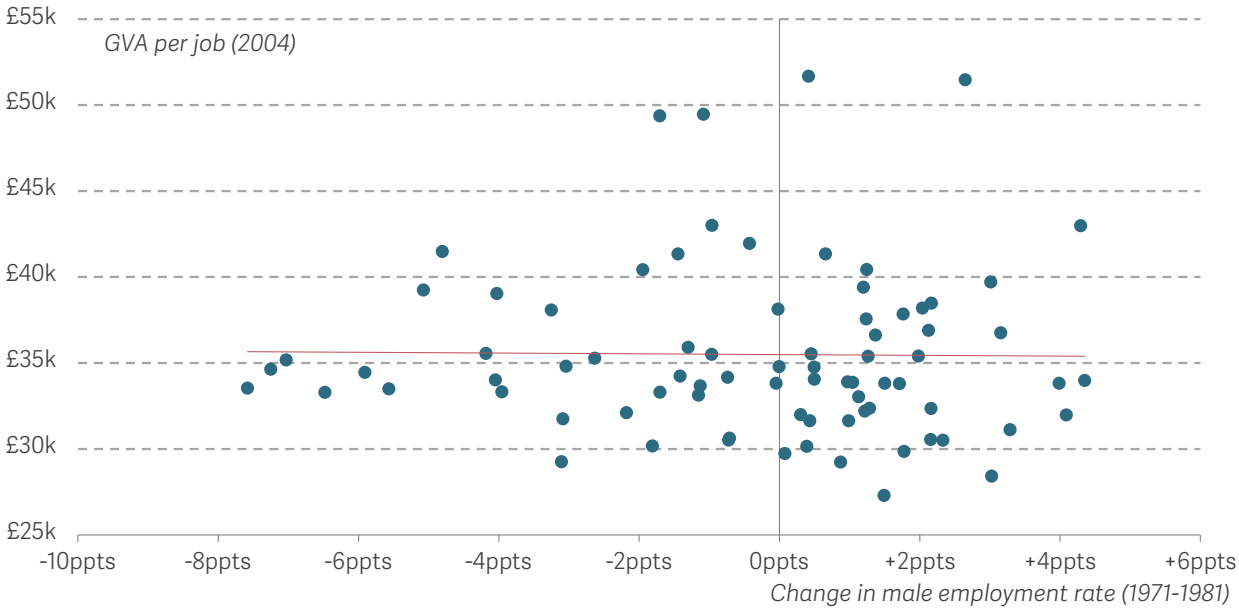
Both the UK's specialisation in services and the shocks experienced during de-industrialisation help explain the overall extent of the UK's spatial disparities in employment rates. However, as shown in Figure 10, these shocks do not help us understand the productivity disparities that areas inherited in the early 2000s and that persist to this day. To better manage future shocks and transitions and think about how we might narrow the UK's productivity disparities, we need to understand what explains

29 L Gagliardi, E Moretti & M Serafinelli, The World's Rust BeltsThe World's Rust Belt, Working Paper, 2020.
30 These are areas that had big unemployment shocks and now have productivity above the area average (Southampton and York) or below the area average (East Kent and Lancaster).

these disparities today. In the next section we do this, by considering the characteristics of areas that explain the large differences in average productivity that we see across the UK.[31]

FIGURE 10: **De-industrialisation shocks experienced in the 1970s do not explain differences in productivity at the start of the 2000s**

Change in male employment in the 1970s against GVA per job in 2004, by area: UK



SOURCE: Analysis of data from P Rice & A Venables, The persistent consequences of adverse shocks: how the 1970s shaped UK regional inequality, Oxford Review of Economic Policy, Vol. 37, 2021; ONS, Subregional Productivity, July 2021.

Capital, skills and total employment shape the UK's current economic geography

We now look at the underlying factors of production which drive local industrial structure and differences in area level productivity. We consider the role of four factors identified by the literature as key determinants of area level productivity – the size of the local economy and its levels of human, physical and intangible capital.[32]

The size of the local economy matters because of agglomeration economies (see Box 3) which mean that, everything else equal, we should expect productivity to increase with size. Of course, everything else is not equal when looking at similar sized areas. Lots of evidence finds that 'human capital' – for example differences in education and skills –

31 We focus on understanding the differences in average productivity across areas, rather than within industries, because evidence for NUTS 1 and NUTS 2 regions suggest that industry mix only plays a small role in explaining productivity differences between areas. See ONS, Understanding spatial productivity in the UK, 2019.

32 H Breinlich et al, Regional Growth and Regional Decline in the Handbook of Economic Growth Vol 2. Edited by Philippe Aghion, Steven N. Durlauf, 2014.

affects the productivity of a given worker. And there are large differences in education and skills across the UK – for example, the share of adults with degrees ranges from 15 per cent in Doncaster to 54 per cent in Brighton.[33] Again, everything else equal, we should expect productivity to increase with the share of local workers who are highly educated and highly skilled.

Labour productivity does not just depend on human capital but also on physical capital – machinery, buildings, computers etc. – that labour employs while working. In addition to these tangible types of capital, recent literature has also emphasised the importance of intangible capital like design, branding, R&D, and software.[34] Once again, everything else equal, we should expect productivity to increase with the amount of total capital available.

As with productivity we need some way to operationalise each of these concepts to analyse their role in explaining spatial differences in productivity. We use total employment to capture the size of the local economy.[35] This ignores the fact that smaller areas might benefit from some of the agglomeration economies generated by nearby areas – this might help explain the high productivity of Swindon, North Hampshire, and Milton Keynes, for example.

We measure differences in human capital using the share of the working age population with a degree-level qualification. This ignores lots of nuance. Productivity effects may differ by institution, degrees, and degree classes.[36] This measure also ignores differences between those with good vocational qualifications and those without.[37] Finally, formal qualifications are not the only determinant of human capital. Lots of hard to measure things – talent, resourcefulness, ability – will also affect how productive someone is when working. Despite these caveats, there is lots of evidence that having a degree is a key dimension on which worker productivity differs and so spatial differences in the share with a degree will matter.

Finally, we measure differences in physical and intangible capital using estimates of local capital stocks that we have constructed from newly available data on differences in investment across areas.[38] The data appendix describes how we construct these estimates. These measures come with the strongest caveats of all those we use – the

33 H Overman & X Xu, Spatial Disparities across labour market, IFS Deaton Review, 2022.
34 J Haskel & S Westlake , Capitalism without Capital: The Rise of the Intangible Economy, Princeton University Press, 2017.
35 This is a better measure than total population, as retirees, children and the unemployed, do not play much of a role in the agglomeration economies that we outlined above.
36 Department for Education, The relative labour market returns to different degrees, 2018.
37 See Hanushek and Woesmann who define skills using a PISA test standard (PISA is an OECD programme that measures 15-year-olds' skills in reading, mathematics, and sciences consistently across countries). Unfortunately, such measures are not available at the local level. See E Hanushek & L Woessmann, Education, knowledge capital, and economic growth, The Economics of Education, 2020.
38 ONS, Experimental regional gross fixed capital formation (GFCF) estimates by asset type: 1997 to 2020, 2022. The source provides data for total GFCF and GCFC broken down by the following asset types: buildings and structures, ICT equipment, transport equipment, intangible assets (including R&D) and other tangible assets.

data used to construct them is experimental, reported in current prices and only recently available.[39] In addition, as described in the data appendix, we use the discounted flow of annual investments combined with estimates of capital stocks in 1997 (derived using a mix of national and local data) to construct measures of local capital stock in each year. Despite these caveats, this data provides an indication of how much investment and capital stocks differ across local areas. And, as we will see, these differences matter a lot for understanding differences in labour productivity, so ignoring them is not an option.

One simple way to get a feeling for the role of these different factors is to look at the correlation between productivity and each of the factors in turn.[40] Table A2 in the technical annex reports these correlations, as well as the correlations between the different factors. Size, graduate share, and total capital stock are all positively correlated with GVA per job. The problem with these correlations is that, for example, the correlation between size and GVA per job also captures the way in which human capital and total capital stock change with size.[41]

Regression analysis avoids this problem by looking at the combined effects of size, human, physical and intangible capital in explaining spatial productivity disparities. Because disparities are persistent during this period, we focus on understanding differences in the levels of productivity, rather than growth rates.[42] We run regressions for GVA per job to understand differences at the start of the period for which we have data - the mid-2000s - and at the end of the period - the end of the 2010s.[43] The technical appendix provides more details.

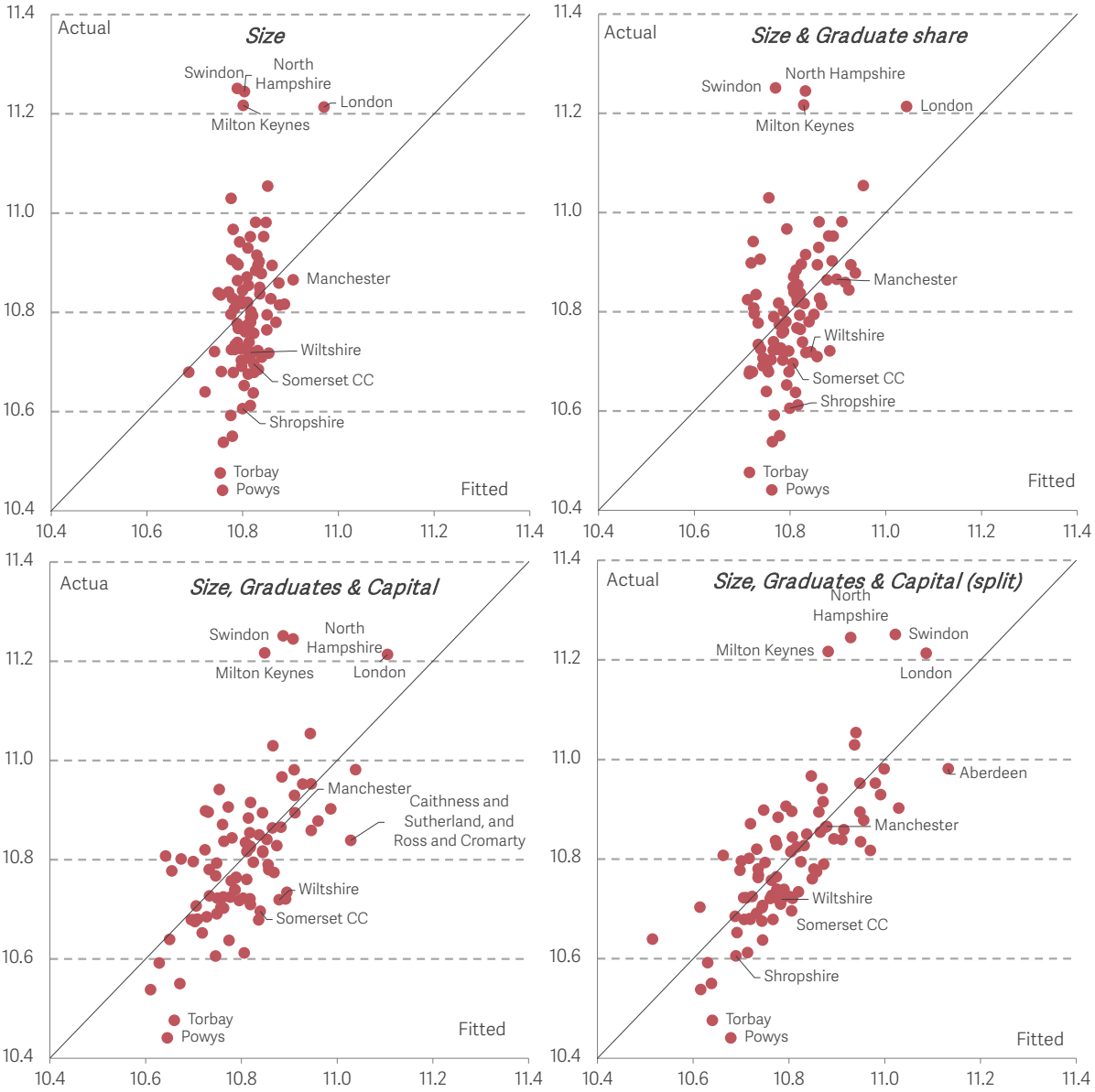
The results, reported in Table A3 of the technical appendix, show that the size of the local economy (as measured by employment), human capital (as measured by graduate shares), and total capital stock account for 40 per cent of the spatial variation in productivity observed in 2019. Allowing for different kinds of capital stock increases this figure to almost 55 per cent. We can see the importance of allowing for capital stocks by noting that a combination of size and skill explains 17 per cent of the variance as opposed to the 40 to 55 per cent explained once we use measures of capital stocks.[44] Figure 11 illustrates this graphically by plotting actual GVA per job against predicted GVA per job from four different regressions – size only (top-left panel), size and human capital

39 To be consistent with the investment data, the variables included in our analysis are in current prices. As our main analysis focuses on the causes of spatial differences in 2019, using current or constant prices would not affect our results (especially as inflation has been low and relatively constant, at around 2 per cent, over the years 1997-2019). For more details, see the Data Appendix.
40 Table A1 in the technical appendix provides descriptive statistics.
41 For size, the correlation between size and GVA per job will partly capture the role of more skills (as skills and size are positively correlated) and partly capture the role of having less capital (as capital and size are negatively correlated).
42 Consistent with what we would expect given persistence, these three factors do not have much explanatory power for growth rates.
43 For the mid-2000s we use data on three-year averages from 2004 to 2006. For the end of the 2010s we use data on three-year averages from 2017 to 2019. All our substantive conclusions are also robust to using GVA per hour worked as an alternative measure of productivity
44 A univariate regression of GVA per capita on total capital stocks explains 22 per cent of the variance (more than the amount explained by size and skills combined).

(top-right panel), size, human, and total capital (bottom-left panel), and size, human capital, and capital stocks broken down by type (bottom-right panel). The closer the points are to the 45-degree line (where predicted productivity equals actual productivity), the more of the variation in actual productivity the regression can explain.

FIGURE 11: **Differences in size, human capital and capital stocks explain up to half of the differences in productivity across areas**

Actual and fitted log GVA per job, by area: GB, 2019



NOTES: All values are 3-year moving averages ending in 2019. All regressions use the three-year average of variables. Size refers to regression of log GVA per job on log employment. "Size & Graduate share" refers to regression of log GVA per job on log employment, and graduate share. "Size, graduates & capital" refers to regression of log GVA per job on log employment, graduate share, and log total capital per job. "Size, graduates & capital (split)" refers to regression of log GVA per job on log employment, graduate share, and log capital per job split by ICT Equipment, tangibles, transport equipment, building capital and other tangible capital. Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Annual Population Survey; ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data.

As discussed in Section 2, the residuals in this regression – the difference between actual and predicted GVA per job – are the part of productivity that cannot be accounted for by measured inputs of human capital and capital stocks, and the agglomeration economies that stem from the size of the local economy. An area that lies below the 45-degree line has a GVA per job that is lower than predicted (a negative residual) and vice-versa for areas above the line. Such differences may arise because firms use different technologies or organisational practices in different areas. They will also capture the way the area influences productivity, beyond the effects working through size and the concentration of human capital and capital stocks. For example, some of the agglomeration economies from the clustering of different types of industries might be captured here. So too would some of the productivity disadvantages of being a remote island or rural economy.

Looking across the panels shows how the fit improves, especially when measures of capital stock are added. These new capital stock measures may be experimental but their availability, combined with sub-national estimates for GVA, marks a big step forward in our ability to understand spatial disparities in productivity at a suitable spatial scale.

As well as looking at the overall explanatory power of the factors combined, we can also look at the role of individual factors using the estimated coefficients from the regression analysis. Each of these coefficients gives an estimate for the effect of changing one factor – e.g. size – holding the others constant. Starting with size - all else equal, a 1 per cent increase in total employment increases productivity by 0.05 per cent. Or, to put it another way, a doubling of total employment increases productivity by 5 per cent. Unsurprisingly, the major cities of London, Manchester, and Birmingham have large productivity advantages over the agricultural areas of Herefordshire, the beaches of Cornwall and the Isles of Scilly, and the hills of the Lake District.

A 1 per cent increase in graduate share increases productivity by 0.6 per cent. Areas with lots of graduates are on average more productive. Finally, a 1 per cent increase in capital stock increases productivity by 0.4 per cent. Areas with lots of capital per job are more productive too. These estimates are in line with existing research for the US, that shows that a 1 percent increase in the city share of college graduates is associated with a 0.5-0.7 percent increase in output[45] and that a 1 percent increase in capital per job increases output by 0.3-0.7 percent).[46] Box 4 shows what happens when we run similar regressions for the other EU countries used as comparisons above (although regressions for those countries do not include measures of capital stock).

45 E Moretti, 'Worker's education, spillovers, and productivity: Evidence from plant-level production functions', American Economic Review, vol. 94(3), 2004.
46 N Bloom et al., What drives differences in management practices?. American Economic Review, vol 109 (5), 2019.

BOX 4: **Benchmarking against results for other EU countries**

Our results can be benchmarked against similar regressions for France, Germany, Italy, and Spain run for areas defined using the same combination of OECD metro areas and NUTS 3 as used for the UK. For these countries, we collected data on productivity (GVA per job), size (employment) and human capital (graduate shares). Unfortunately, data on capital stock is not available at the appropriate spatial scale. We run two benchmark regressions – one using size only, the other using size and graduate shares. Results are reported in Tables A4 and A5 in the technical annex.

In the regression including only size, as discussed in the main text, the coefficient captures the effect of size and the way in which human capital and total capital stock change with size. For the UK, the elasticity of GVA job with respect to city size is 0.045. France has the highest elasticity (0.091) followed by Italy (0.070) and Germany (0.064). Spain's elasticity (0.017) is lower than the UK and insignificant.

In the second regression, including both size and graduates shares the coefficient on city size drops for all countries. The figure for the UK falls (from 0.044 to 0.042). The slight reduction in the coefficient reflects the fact the graduate shares are correlated with city size. France continues to have the highest elasticity (0.07) followed by Germany (0.057) and Italy (0.050). Spain's elasticity (-0.016) remains lower than the UK and insignificant. The changes in the coefficients we see for all four EU countries are consistent with graduate shares being positively correlated with city size as they are in the UK. All these results are robust to dropping the largest area in each country (including London for the UK).

Taken together, these benchmark regressions point to one of the weaknesses of the UK's larger cities outside of London. These cities offer productivity advantages relative to smaller areas. But the relatively low graduate shares mean that the extent of the effect of size on productivity is smaller than elsewhere. Without comparable data on capital stocks, we can only speculate as to whether the same is true for capital. However, the main text suggests relatively low levels of capital stock per job explain a lot of the gap between our second cities and London and this may also help explain why the size effect is smaller than elsewhere.

We can also compare these results at the end of the 2010s to those from the mid-2000s. Compared to the mid-2000s, the importance of size and skills has increased as has the role of intangibles, such as research and development capital, and the role of information and communications technologies (ICT) equipment. Physical capital, such as buildings and structures, matter less.[47] These changes are consistent with what we might expect given skill-biased technological change in an economy that is highly specialised in services. As discussed above, high-tech services benefit from agglomeration economies, so we would expect the importance of size to increase. Skill biased technological change increases the productivity of high-skilled workers and complementary investments in intangibles and ICT, so we would expect the importance of these to increase too.[48]

These regression results help explain what determines the productivity of different areas. Table 2 does this for the top 10 most-productive areas and Table 3 for the bottom 10 least-productive areas. For each area, the table reports size, graduate share, and total capital per job as well as the residual – the part of productivity that is unexplained – expressed as the percentage difference between predicted and actual GVA per job. The residual plays a big role for the three smaller areas – Swindon, North Hampshire, and Milton Keynes – that stand out in Table 2 as having GVA per job higher than London. One possible explanation, as discussed previously, is that their proximity to London means they benefit from some of agglomeration economies.[49] Proximity to London might also make them more attractive locations for firms to invest or high skilled workers to live, but this benefit of proximity would be picked up in them having more graduates, or capital stock, or both.[50]

The factors we consider do a better job at explaining the remaining seven high productivity areas. Although there is no clear link between size and productivity amongst the highest productivity areas, they are larger than the least productive areas – just under twice as large on average (ignoring London).[51] Among the most productive areas, the three smallest make up for a lack of size by having high levels of capital per job (rather than more graduates) as a result of exploiting or processing natural resources (Falkirk)

47 These results and comparisons are robust to different measures of the initial capital stock. As explained above, and in more detail in the Data Appendix, the initial capital stock is the only variable that is not directly available at the area level and it needs to be apportioned from the total value at the country level.
48 See Figure 7 in D Autor, Work of the Past, Work of the Future, AEA Papers and Proceedings, 2019. It shows that "while denser commuter zones have traditionally been more intensive in high-skill work, the level and slope of this density-skill-intensity relationship rose consistently over multiple decades".
49 Re-running our regressions including a measure of proximity to other large local economies (the inverse distance weighted sum of GVA) as an additional explanatory variable increases the fit of the regression from 0.55 to 0.60. Proximity to large local economies does benefit some agglomeration economies, including the examples of North Hampshire and Luton used in the text. And isolation costs others, such as Torbay, Na h-Eileanan Siar or Aberdeen.
50 As discussed above, this may also partly reflect a measurement issue due to a headquarters effect.
51 The average employment size of the 9 largest areas (ignoring London) is around 220,000 as opposed to 118,000 for the 10 smallest.

or manufacturing and aviation (Luton). The bigger metros in the group combine size with skills (Edinburgh) or capital (Coventry) or both (Aberdeen). London, unsurprisingly, combines big size advantages with high capital and graduate shares.[52]

TABLE 2: **The top 10 most productive areas are large and have high levels of capital per job**

Characteristics of the top 10 most productive areas: UK, 2019

Region	GVA per job	Size	Graduate share	Total Capital per job	Fitted GVA per job	Residual (%)
Swindon	£76,952	120,781	34%	£163,139	£53,494	30%
North Hampshire	£76,482	169,304	40%	£149,214	£54,620	29%
Milton Keynes	£74,364	160,134	40%	£129,126	£51,475	31%
London	£74,120	7,541,853	49%	£134,867	£66,534	10%
Edinburgh	£63,199	512,096	51%	£121,410	£56,624	10%
Luton	£61,663	89,301	33%	£161,055	£52,360	15%
Aberdeen	£58,768	288,401	48%	£175,002	£62,233	6%
Coventry	£58,742	473,875	39%	£134,707	£54,752	7%
Falkirk	£58,730	67,034	37%	£140,506	£49,869	15%
Central Bedfordshire	£57,919	98,935	38%	£156,057	£53,367	8%
Average (Top 10)	£66,094	952,171	41%	£146,508	£55,533	16%
Average (All)	£49,756	315,479	37%	£122,509	£49,445	-1%

NOTES: Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas. All variables are 3-year moving averages. Average residual is non-zero as this refers to the residual in cash terms as a proportion of total GVA per job, in log units residuals average to zero as expected.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Annual Population Survey; ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data.

At the other end of the productivity distribution, Table 3 shows that the bottom 10 areas are generally small, rural, and sparsely populated; or are home to a relatively large share of lower skilled workers (or both). All areas have markedly lower capital per job. Finally, all these areas do worse than expected conditional on their size, capital, and graduate shares.

52 Measures of capital stock include residential structures - this may inflate the apparent amount of capital in commuter towns potentially leading us to underestimate the importance of capital for productivity overall.

TABLE 3: **The 10 least productive areas are small and have few graduates**

Characteristics of 10 least productive areas: UK, 2019

Region	GVA per job	Size	Graduate share	Total Capital per job	Fitted GVA per job	Residual (%)
South West Wales	£42,288	167,240	35%	£98,595	£45,183	-7%
Isle of Anglesey	£41,744	25,800	40%	£98,636	£42,209	-1%
Cornwall and Isles of Scilly	£41,662	258,400	35%	£107,520	£47,776	-15%
East Sussex CC	£40,619	223,576	37%	£116,466	£49,320	-21%
Shropshire	£40,362	154,433	36%	£105,005	£46,459	-15%
Conwy and Denbighshire	£39,809	88,133	35%	£84,811	£41,300	-4%
Herefordshire	£38,179	95,233	36%	£92,430	£43,119	-13%
Gwynedd	£37,723	62,100	36%	£82,955	£40,558	-8%
Torbay	£35,458	53,327	31%	£104,878	£42,622	-20%
Powys	£34,232	59,433	37%	£91,330	£42,006	-23%
Average (Bottom 10)	£39,208	118,768	36%	£98,263	£44,055	-13%
Average (All)	£49,756	315,479	37%	£122,509	£49,445	-1%

NOTES: Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas. All variables are 3-year moving averages. Average residual is non-zero as this refers to the residual in cash terms as a proportion of total GVA per job, in log units residuals average to zero as expected.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Annual Population Survey; ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data.

Closing productivity gaps between London and the UK's other major cities will require significant investment and change

The regression analysis also helps think about what it would take to close the productivity gap between places. In the regression, this can happen in one of three ways: (1) changes in the relative size, capital, or skills of different places; (2) changes in the part of productivity that is unexplained by size, capital, or skills (TFP); (3) changes to the importance of these different factors (of the kind we have considered above when discussing the differences between results for mid-2000s and late-2010s).[53] Figure 12 provides an example considering what happens as Manchester's capital, skills and size are increased to match London's. This sequencing - changing capital, then skills, then size - is somewhat arbitrary, although as discussed in the next section, some of these changes are more feasible than others.

The figure shows that in the late-2010s GVA per job in the Manchester metro area was about 30 per cent lower than in the London metro area – a difference that corresponds to a little under £22,000 per job.[54] The average worker in London uses 23 per cent more capital than the average worker in Manchester. Eliminating this difference – which amounts to about £25k more capital per job - increases GVA per job in Manchester

53 Technically, by (1) changing the explanatory variables; (2) changing the residuals or (3) changing the coefficients.
54 This is similar to the productivity gap found at the TTWA level. For example, the ONS finds that the GVA per job in the Manchester TTWA is 32 per cent lower than GVA per job in the London TTWA. See ONS, Productivity in towns and travel to work areas, UK: 2019, 2022.

by around £4,500. The next step in the figure increases Manchester's graduate share from 37 per cent to London's 49 per cent. This closes the gap by around £4,100. Finally, increasing the size of Manchester from 1.7m employees to match London's 7.5m employees accounts for a little under £4,700.[55] The remaining gap is unexplained and partly attributed to Manchester's underperformance given its size, skill and capital (£900) but more to London's overperformance (£7,590).

FIGURE 12: **The changes needed to eliminate the productivity gap between Manchester and London**

GVA per job of Manchester with different levels of total capital, graduate share and total employment compared to London: 2019

NOTES: All values are 3-year moving averages ending in 2019.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Annual Population Survey; ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data.

We can further reduce this unexplained component if we allow for complementarities between different factors – for example, by recognising that additional capital stock per job may have a bigger effect if that additional capital is being used by a higher skilled worker. In the regression, this is achieved by including interaction terms.[56] The regression results, and the equivalent waterfall chart are in the technical annex. Increasing the capital stock alone has a smaller effect than before (narrowing the gap by £3,500 as compared to £4,500). Changing graduate shares in addition to this increase in capital

55 Some, but not much, of this change in employment size could be achieved by increasing the employment rate of the Manchester metro area (74%) to match that of London (76%). It could also be achieved by increasing the effective size of Manchester, e.g. by better linking it to Leeds. We discuss these issues further below.
56 The baseline regression is in log-linear form and already allows for some complementarities between the variables. However, to be able to make meaningful comparisons, i.e. interpreting the coefficients as percent changes, we need to add to the regression interaction terms between the variables.

stock now does more to change the gap (narrowing it by just under £8,500 as compared to £4,100) – because there is a positive complementarity between capital and high skilled workers.[57] Increasing size now does more too (narrowing the gap by just under £7,500 as opposed to £4,700). The Manchester and London residuals now account for only just under £400 and under £2,000 of the gap respectively.

TABLE 4: **Reducing the productivity gap between Manchester and London requires large change**

Three scenarios for reducing the productivity gap between London and Manchester to

	Capital per job	Graduate share	Size	Fitted GVA	Gap to London
Current Manchester	£109,250	37%	1,732,677	£53,263	28%
Capital intensive	£144,509	37%	1,732,677	£59,296	20%
Graduate intensive	£109,250	56%	1,732,677	£59,296	20%
Size intensive	£109,250	37%	15,029,539	£59,296	20%
Balanced (30%)	£142,025	48%	2,252,480	£63,460	14%

20 per cent and one scenario to halve the gap: 2019

NOTES: All values are 3-year moving averages ending in 2019.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Annual Population Survey; ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data.

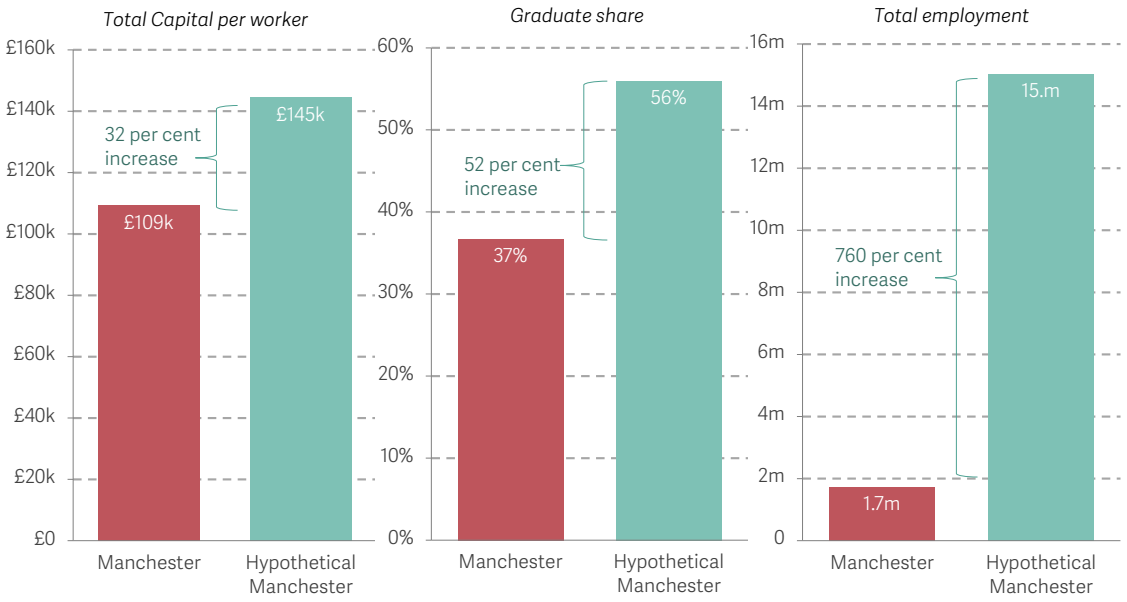
Of course, fully eliminating the gap between Manchester and London is a straw man as it would involve a shift in size for Manchester that seems unrealistic.[58] It would also involve large shifts in capital and graduate shares. What about a more realistic ambition of partially closing the gap? Table 4 presents different scenarios. The first three consider what would be needed to fix the gap by changing just one of the factors and aiming to leave Manchester with a productivity gap that was like that between Lyon and Paris (20 per cent). Figure 13 illustrates the changes needed showing that an increase in size alone is unrealistic - capital and skills must change too. The changes in capital or graduate shares are more realistic – in terms of magnitudes – given that the thought experiment involves shifting just one city. But given the levers that the government has at its disposal and given that much of this investment represents decisions by individual firms and workers, it's difficult to believe that these changes to individual factors are feasible in practice.[59] The final row shows how the gap closes when changing each of the factors by 30 per cent leaving Manchester with a productivity gap like that between Edinburgh and London (15 percent). This is potentially a more feasible route and exploits the

57 This increase captures several productivity enhancing effects i) having more graduates ii) working with more capital and iii) capital being used by more skilled workers.
58 The next section discusses the possibility of increasing the effective size of Manchester (e.g. by better linking it to other northern cities).
59 Note that the issue is not so much about the magnitudes of the changes required, but rather about the private sector returns needed to generate the investment. Adding lots more capital without changing anything else is likely to decrease the returns to investments which is needed to incentivise those increases in capital (and similarly for increases in graduate shares).

complementarity between different factors. The size change here might feel unrealistic, but it is perhaps less so if it is achieved by better integrating Manchester and Leeds. The feasibility of achieving levels of capital stock that are larger per worker than London and graduate shares that are just smaller than London, remains an issue. We return to these subjects in the next section.

FIGURE 13: **The changes needed to close the gap between London and Manchester to 20 per cent using capital, graduate share or size alone are large**

Required changes in capital per job, graduate share and total employment to reduce productivity gap between London and Manchester to 20 per cent: 2019



NOTES: All values are 3-year moving averages ending in 2019. Each chart displays change on single variable needed to reduce the productivity gap between Manchester and London to 20 per cent – the size of that between Lyon and Paris.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Annual Population Survey; ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data.

The analysis so far reveals that London's advantage comes down to a combination of size, human, physical and intangible capital, and the positive complementarities between all three of these factors. And substantially narrowing the disparities between London and even one of our second cities requires significant increases in the (effective) size of the less productive city as well as significant investment in capital and skills.

Table 5 and 6 illustrate the scale of the challenge if the objective is to achieve similar levels of catch-up for cities in each of the 8 regions outside of London and the South East. For each metro area, the first table reports current levels of capital per job, graduates share and size. The second table reports the changes in each of these that would be needed to halve the gap for each of these cities. The total changes involved are

clearly very large, and not necessarily all achievable at the same time (there are only so many graduates, for example). This suggests that realism will be needed on the extent to which we can improve productivity across many different areas at the same time. We return to this issue in the next section.

TABLE 5: **The characteristics of largest city in each region of the UK**

Characteristics of the largest city in each region of the UK: 2019

City	Capital per job	Graduate share	Size
Newcastle	£104,996	34%	540,537
Manchester	£109,250	37%	1,732,677
Leeds	£108,880	36%	898,521
Leicester	£104,619	38%	596,542
West Midlands UA	£106,199	30%	1,140,885
Bristol	£116,435	46%	632,034
Cardiff	£109,907	37%	500,592
Glasgow	£128,255	43%	878,070
London	£134,867	49%	7,541,853

NOTES: Values are a 3-year moving average in 2019.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Annual Population Survey; ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data.

TABLE 6: **Significant change is needed across the board to halve the gaps in productivity between the largest city in each region of the UK and London**

Changes required to halve the gap in productivity between the largest city in each region of the UK and London: 2019

Region	City	GVA per job	Gap to London	Fitted values of GVA per job	Gap to London from Fitted	Increase in capital and grads to halve the gap (assuming residual)	Increase in capital and grads to halve gap (no residual)	Required increase in capital and grads if size 5% larger (no residual)
North East	Newcastle	£45,147	-39%	£48,820	-34%	52%	39%	38%
North West	Manchester	£52,337	-29%	£53,263	-28%	35%	32%	31%
Yorkshire & Humber	Leeds	£49,737	-33%	£51,276	-31%	41%	36%	35%
East Midlands	Leicester	£50,368	-32%	£49,950	-33%	40%	41%	41%
West Midlands	West Midlands UA	£49,825	-33%	£49,597	-33%	46%	46%	46%
South West	Bristol	£53,880	-27%	£54,826	-26%	29%	26%	25%
Wales	Cardiff	£48,760	-34%	£50,272	-32%	43%	38%	37%
Scotland	Glasgow	£51,997	-30%	£56,730	-23%	31%	18%	17%

NOTES: Values are a 3-year moving average in 2019. 'Assuming residual' refers to a scenario in which the underperformance of the area relative to its fitted value of GVA per job is assumed to continue to hold in cash terms, while 'no residual' refers to a scenario in which this underperformance is eliminated.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Annual Population Survey; ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data.

So far, we have focused on changes in the relative size, capital, or skills of different places and in the part of productivity that is unexplained by size, capital, or skills - what about changes in the importance of these different factors? When discussing the

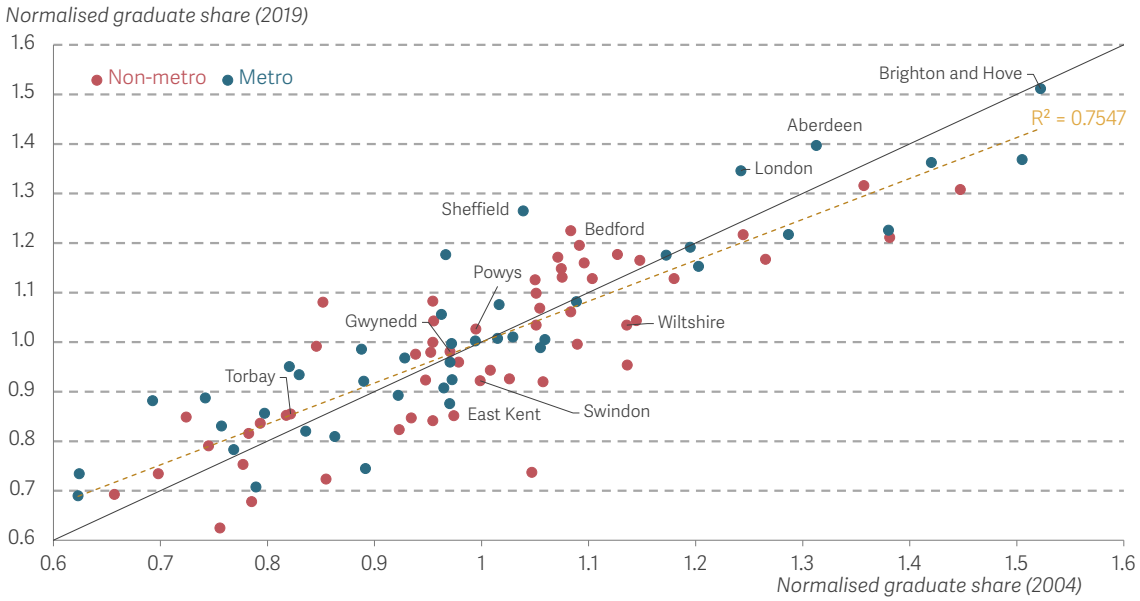
differences between results in the mid-2000s and the late 2010s the shift towards high skilled services helps explain the growing important of skills, size and ICT and intangible capital.[60] A change in our industrial structure in the opposite direction – a return to a more manufacturing orientated economy – could reverse this trend. However, as documented in a recent report for the Economy 2030 Inquiry, most developed countries, including the UK, have not changed their specialisms much over the course of recent decades.[61] For example, the UK's strength in services was present in 1980, before the rapid de-industrialisation of its economy was complete, and this persistence of specialisation is seen across most developed economies. As a result, policy makers should be cautious about the extent to which they can narrow large spatial disparities by attempting to change the industrial structure of the UK. We return to this issue below, when we consider some of the changes that are coming in the next decade, although none of these are likely to substantially reduce productivity disparities. Narrowing productivity disparities will therefore require changes in capital, graduate shares and size (or in the unexplained part of productivity), rather than hoping that changing industrial structure can change their relative importance.

The evidence suggests the market forces will not generate significant changes in the spatial distribution of these underlying factors. Much of the difference in human, physical and intangible capital reflects location and investment decisions by firms and individual workers. If returns to human, physical or intangible capital are high in places where it is scarce – for example, because a firm located in a remote area that needs high skilled workers can pay a lot to attract those high skilled workers – then this will tend to reduce the concentration of all types of capital. Complementarities between human, physical and intangible capital, and the agglomeration economies that come from spatial concentration work against this equilibrating force.[62] The patterns that we described in Section 2 suggest that, at the extremes of the distribution – including most importantly in London – these agglomeration forces are winning out over convergence. The high degree of persistence experienced for areas overall suggests that if convergence is happening, it is a slow process.

60 D. Graham, Identifying urbanisation and localisation externalities in manufacturing and service industries, Papers in Regional Science, vol 88, n 1, March 2009. Also D Autor, Work of the Past, Work of the Future, AEA Papers and Proceedings, 2019.
61 J De Lyon et al., Enduring strengths: Analysing the UK's current and potential economic strengths, and what they mean for its economic strategy, at the start of the decisive decade, Resolution Foundation, 2022.
62 P Beaudry, M Doms & E Lewis, Should the personal computer be considered a technological revolution? Evidence from US Metropolitan Areas, Journal of Political Economy, 2010.

FIGURE 14: **Graduate shares are highly persistent**

Lagged normalised graduate shares against current graduate share, by area: UK, 2004 & 2019



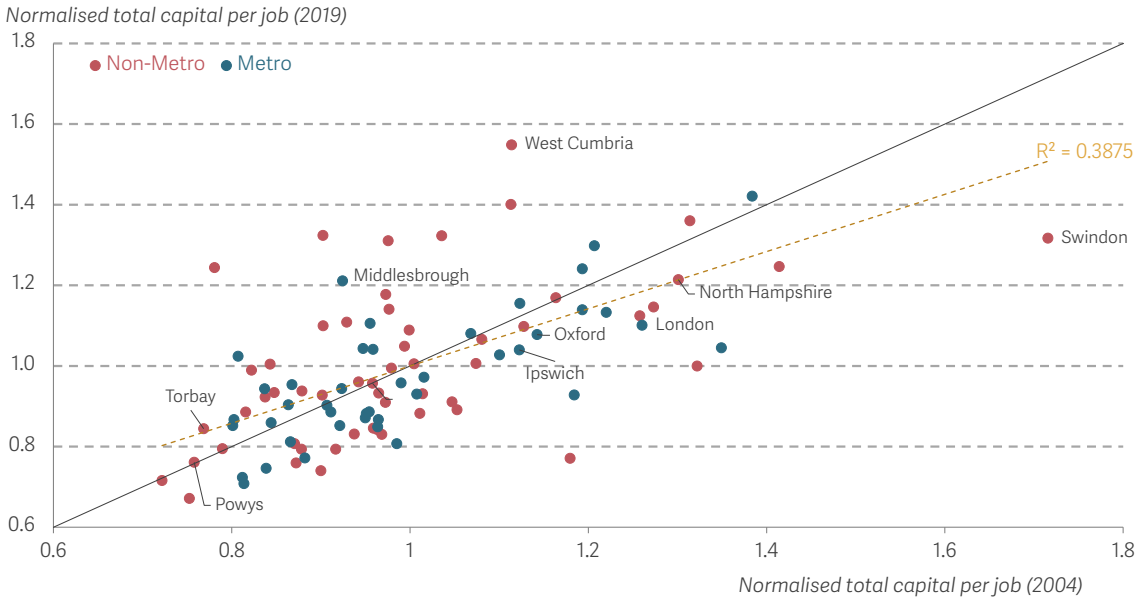
NOTES: Graduate share is normalised by dividing the value for each area by the average across all areas for that year. Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas.
SOURCE: Analysis of ONS, Annual Population Survey.

This story of persistence in productivity disparities is repeated for the individual factors that we have shown account for a large part of the variation in GVA per job across areas. For example, Figure 14 shows that, despite the huge increase in the share of graduates that occurred during the last two decades, the relative percentage share of those graduates living in each area is persistent. Areas that had high levels of graduates among the population in 2004 continue to do so in 2019 (and vice-versa).[63] A similar story holds when considering total capital per job (as seen in Figure 15) - although there is less persistence. This suggests that there might be more scope for policy to shift capital stock than shares of graduates – not least because some of this capital is directly funded by government.

63 Two factors explain this persistence 1) differences in educational outcomes across areas and 2) selective migration of graduates. For example, just 19 per cent of children who grew up in Grimsby were graduates by age 27, compared with 42 per cent of children who grew up in Turnbridge Wells. By age 27, only 12 per cent of those who live in Grimsby have a degree – half of the 19 per cent of children from Grimsby who got degrees had left. This outflow was partially offset by the in-migration of graduates who grew up in other areas. In contrast, London, which already has high graduation rates, further attracts graduates through migration. See Overman and Xu, Spatial disparities across labour markets, IFS Deaton Review, 2022.

FIGURE 15: **Capital stocks are quite persistent**

Lagged normalised capital stocks per job against current normalised capital stock per job, by area: UK, 2004 & 2019



NOTES: Total capital per job is normalised by dividing the value for each area by the average across all areas for that year. Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas.
SOURCE: Analysis of ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data.

Additional work is needed to further improve our understanding of the drivers of spatial disparities in productivity. However, the evidence we have presented in this section gives a feeling for the substantial changes that would be needed to reduce these disparities. The next section considers how these changes might happen and the implications for both the national economy and for different areas and individuals affected by these changes.

Section 5

Implications for policy

As we have shown in previous reports, mediocre management and weak investment in ideas, capital, and skills explain the UK's low productivity levels. Substantial investments will be needed to close the gap between the UK and other countries. Spatial disparities in productivity create an additional challenge – with big changes in the distribution of area size, skills, capital, or in Total Factor Productivity (the unexplained performance of areas), needed to narrow these disparities.

Given the scale of this required change an economic strategy that aims to do this must grapple with two key trade offs. First, in terms of whether, and how quickly, national productivity improves and spatial disparities narrow. Second, in terms of which places are targeted given constraints on the extent to which productivity can increase everywhere, and at the same time.

In addition to grappling with these trade offs, an economic strategy aimed at narrowing productivity disparities must consider who gains from the strategy. A more equal spread of investment and of graduates – and globally competitive cities outside of London and the South East – may help reduce spatial disparities and improve productivity in those cities and the surrounding areas, but it is no simple fix for improving outcomes for poorer households. To do this, complementary investments must make sure that poorer households can access the opportunities generated.

The coming decade of change – driven by Covid-19, Brexit and net zero – might change the balance of the economic forces driving productivity disparities. However, it would be dangerous to assume that these changes will do policy makers' job for them by reducing – rather than increasing – spatial disparities. Instead, policy makers need to be realistic about the forces which shape the economic geography of the UK and about the size of the interventions that will be required in the coming decade to make a difference.

In this section, we provide further discussion of how these changes might happen and over what time-period and consider trade offs that an economic strategy that wants to improve national productivity and narrow productivity disparities must consider.[64] We also discuss the implications of these changes for the areas and individuals affected.

Given the scale of investment needed there are likely to be trade offs between improving national productivity and narrowing productivity disparities

For a more-or-less fully employed economy like the UK's, increasing investment at anything more than a glacial pace will mean less consumption, or more overseas borrowing.[65] This illustrates the difficult choices that a move to a higher investment path will entail, and also the importance of improving economic efficiency through additional, complementary, means.

And such investment will be needed: French workers, for example, use over 40 per cent more capital than UK workers, enough to account for the whole productivity gap with the UK.[66] Would a more equal distribution of investment help or hinder this catch-up? No one knows for sure, although it seems likely that investment in the London metro area – a highly productive area that accounts for 25 per cent of UK employment – to increase its productivity to levels seen in Paris, would play an important part in narrowing the gap between the UK and other countries (see Figure 7).

This trade off – between narrowing the gap with other countries and narrowing spatial disparities within the UK - could be avoided if the returns to investment are higher outside London (the regressions only pick up the average effect). Consider, for example, investment in public transport - the aspect of government spending whose spatial distribution has received the most attention to date.[67] Some commentators suggest that the uneven distribution of public infrastructure spending reflects a London bias in the way projects are appraised and funds allocated.[68] Analysis using data on the benefit-cost ratios (BCR) used to make those decisions finds no strong evidence of significant regional biases. More importantly for the issue at hand, a counterfactual that involves the uplifting of benefits outside London, suggests that BCRs would need to be underreporting benefits of non-London schemes by a large margin to change this conclusion.[69] This suggests that even if government picks projects wisely, at some point,

64 Another tricky trade off involves the balance between central and local government in developing and delivering this economic strategy. The inquiry will consider this in a future report.
65 J Oliveira-Cunha et al., Business time: How ready are UK firms for the decisive decade?, The Economy 2030 Inquiry, May 2021.
66 J Oliveira-Cunha et al., Business time: How ready are UK firms for the decisive decade?, Resolution Foundation, November 2021.
67 See L Raikes, Transport Investment in the Northern Powerhouse, Institute for Public Policy Research, 2019.
68 See for example: D Coyle & M Sensier, The Imperial Treasury: appraisal methodology and regional economic performance in the UK, Bennett Institute for Public Policy Cambridge, 2018.
69 N González-Pampillón & H Overman, Regional Differences in UK Transport BCRs: An Empirical Assessment, Centre for Economic Performance, LSE, 2018.

the redistribution of public infrastructure spending on the scale needed to substantively narrow productivity gaps is likely to involve funding relatively low returns projects. Once this happens, government faces a trade off between how quickly national productivity improves and spatial disparities narrow.

This trade off is exacerbated if productive areas generate positive spillovers for other areas. In the case of investment in our more productive areas, an obvious example of such a spillover is through its contribution to the tax base.[70] A second example comes from considering increasing investment in ICT and intangible capital ('innovation') outside of London and the South East. As with public infrastructure expenditure, to the extent that current innovation expenditure is biased – and ignores opportunities for high returns in areas outside the Golden Triangle – this redistribution could have no consequences for overall innovation and productivity.[71] Unfortunately, given the magnitude of the changes required, it is hard to imagine that removing bias in government and private sector funding decisions will be enough. At some point redistribution on the scale that is needed is likely to impact overall innovation levels by funding lower return projects. This is a particular worry for R&D given the evidence on strong benefits from the concentration of innovation activity.[72]

Narrowing disparities requires difficult choices on where to prioritise investment

Both these examples also help illustrate the second trade off concerning the extent to which improved productivity can be pursued everywhere, all at once. The most obvious way in which this happens is that, within a given funding envelope, decisions must be made about where to invest. Less obvious, but as important, are constraints on other changes that will be required to complement these investments.

To see this, note that while R&D activity produces some output directly, increased innovation is only the first step in achieving the changes required. Large local productivity benefits will only come if these investments create additional capital investment and high-skilled employment in the private sector – for example by strengthening a local industrial cluster.[73] As the examples in Section 4 make clear, for these changes to close productivity gaps will require substantial additional investment, large changes in graduate shares and even an increase in size. Given there are

70 See L McGough & G Piazza, 10 years of tax. How cities contribute to the national exchequer, Centre for Cities, July 2016.
71 See T Forth & R AL Jones, The Missing £4 Billion, NESTA, May 2020.
72 See A Jaffe et al., Geographic Localization of Knowledge Spillovers as Evidenced by Patent Citations, the Quarterly Journal of Economics, vol 108, 1993; G A. Carlino et al., Urban density and the rate of invention, Journal of Urban Economics, vol 61, May 2007.
73 S Kantor & A Whalley, Knowledge Spillovers from Research Universities: Evidence from Endowment Value Shocks, Review of Economics and Statistics, 2014.

constraints on total investment, and the number of graduates and workers, it is not feasible to increase all these everywhere, all at once.

To consider this trade off more clearly let us return to investments in public transport infrastructure. As with R&D, while public transport does produce some output directly, the main way in which it increases productivity is by supporting increases in size and acting as a complement to human, physical and intangible capital. Looking at a concrete example of the impact of a 20-minute reduction in travel time between Leeds and Manchester illustrates the issues.[74] Estimates of the effect on wages – derived using an approach similar to that used by the government to appraise the wider productivity benefits of transport - suggest increases in the 23 most affected Local Authorities that range from 1.1 per cent (Tameside) to 2.7 per cent (Wakefield). However, most of these wage increases occur because the composition of the workforce is different in larger, better-connected places.[75] The wage effects of this improvement for an individual worker, with given and unchanging characteristics, are smaller at somewhere between 0.2 and 0.5 of a percentage point. The main way in which productivity improves is by changing the capital, skills, or size of the affected areas. Generalising from this example, unless we can change all these factors in many areas at once, this means that decisions will need to be taken to prioritise areas for investment.

Table 4 makes a similar point. The direct effect of increasing the size of Manchester is quite small. The regression results suggest that a 20 per cent increase in size only increases GVA per job by about 1 per cent. The bigger effects come if human, physical and intangible capital adjust in response to this increase in GVA per job. We have discussed investment above, but similar issues apply to changes in graduate shares.

Changes in graduate shares need an area to produce more graduates or attract more graduates. The time required to produce more graduates will depend on what is needed to improve educational outcomes. If the issue is in primary schools, then it would be a couple of decades before changes filter through to the labour market. If the issue is with further education, then changes will filter through more quickly. Even then, these changes will change flows – entrants into the labour market – and that will take time to change stocks – the overall percentage of graduate workers.

Overall, this suggests that large shifts in graduate shares will need to change the location decisions of existing graduates. Unfortunately, with the total number of domestic

74 H. G. Overman et al., Strengthening economic linkages between Leeds and Manchester: feasibility and implications, The Northern Way, 2009.
75 Part of this composition effect is due to the years of education of the workforce and an even larger part to unobserved characteristics of workers such as, for example, cognitive ability.

graduates broadly fixed this approach is zero sum – shifting more graduates to one area means fewer graduates elsewhere.[76]

Focusing on linking places better does not eliminate difficult choices on where to invest

One way to try to avoid these trade offs is to focus on better transport links between places – allowing graduates (and other workers) to commute from their current location to new opportunities created by investment elsewhere. More generally, better transport links can be used to increase the effective size of an area and generate agglomeration economies across areas. This is one of the advantages suggested for the Northern Powerhouse, for example.[77] Focusing on increased effective size has the added benefit of getting around some of the problems that the UK's highly unresponsive planning system creates in directly increasing the size of an area.

There are, however, limits to how far increasing effective size can substitute for increasing actual size because agglomeration economies decay with distance.[78] Setting this aside, as we have just seen from the Manchester-Leeds example, changes in size do not generate large productivity effects without the accompanying increases in physical and human capital. And better connecting Manchester (37 per cent graduate share) and Leeds (36 per cent graduate share) does not do this as it leaves overall graduate shares roughly unchanged. The big benefits from reducing journey times between Manchester and Leeds will only come if this makes both areas more attractive locations for graduates (or physical and intangible capital). But then we are back to the zero-sum problem of needing to shift graduates to Manchester and Leeds from elsewhere.[79]

Better transport links are not the only option for increasing effective size. Despite progress in the last decades, policy could do more to narrow the employment rate gaps that were illustrated in Figure 10. The challenge is how policy might achieve these changes. A large part of the disparities in employment rates are driven by the spatial concentration of workers with different skills and hence different labour market opportunities.[80] And the areas which tend to do relatively well in terms of employment rates for the low-skilled are also those that tend to do relatively well for the high-skilled

76 An alternative to focusing on graduates is to improve the productivity of non-graduates, for example, by improving further and vocational education. Many would argue that there has been way too much focus on graduates at the expense of improving outcomes for non-graduates – for example by improving investment in FE. See L Sibieta, I Tahir & B Waltmann, Adult education: the past, present and future, Institute for Fiscal Studies, 2022.

77 See P Swinney, Building the Northern Powerhouse, Centre for Cities, June 2016.

78 See S Rosenthal & W Strange, Evidence on the Nature and Sources of Agglomeration Economies in the Handbook of Regional and Urban Economics, edited by J V Henderson & J-F Thisse, 2004; D J Graham, S Gibbons, & R Martin, Transport Investment and the Distance Decay of Agglomeration Benefits, Report for the Departmetn of Transport, January 2009.

79 To be clear, here we are talking about the zero-sum problem of moving around lots of graduates given a fixed number of graduates at any point in time, rather than suggesting that such changes would be zero-sum from a productivity perspective.

80 Overman and Xu, Spatial disparities across labour markets, IFS Deaton Review, 2022.

(and have high housing prices to boot). And, as with transport links, big productivity effects from changing effective size come from inducing changes in human, physical or intangible capital. Narrowing spatial disparities in employment rates would help narrow income disparities, but does not eliminate difficult choices on where to invest if we want to see a substantial narrowing of productivity disparities.

Another possibility for reducing these trade offs is to consider policies that might change the gaps in productivity that are unexplained by size, skills and capital – what we referred to as the area's Total Factor Productivity (TFP) above. One important area which deserves much more consideration than we can give here, is to improve the productivity of non-graduates, for example, by improving further and vocational education.[81]

One potential solution to the problem of low productivity (which has received a lot of attention at the national level) is to improve the performance of the long tail of low productivity firms – for example, through improving management processes and the diffusion of technology[82] - and a plethora of business support programmes aim to do just that.[83] Addressing barriers that hold firms back from innovating, and growing, can help to facilitate the process of reallocation of resources into more productive businesses.[84] However, the overall share of output produced in the least productive firms is so low that raising their productivity will not do much to boost the average. A more promising avenue may be to facilitate the reallocation of resources from them to better performing firms – although it is not clear what policy levers exist at the local level to help facilitate this and the implications this would have for regional productivity gaps.

An economic strategy aimed at narrowing productivity disparities must decide whether to target investment or not

Choices about where to invest will influence how quickly national productivity improves and spatial disparities narrow. This is not just a story about London versus the rest. However, when thinking about where to invest it is important to recognise the strong market forces that drive high productivity in our largest city. London's economic advantages stem from the concentration of human, physical and intangible capital and from its economic size, and these factors are self-reinforcing. London's economic strength also spills over to benefit towns and cities across the wider South East.[85] Given this, and the constraints discussed above, any strategy that wants to achieve meaningful reductions in spatial disparities will require large, spatially targeted investments in a

81 See, for example, L Sibieta, I Tahir & B Waltmann, Adult education: the past, present and future, Institute for Fiscal Studies, 2022.
82 See J De Loecker, T Obermeier, & J Van Reenen, Firms and Inequalities, IFS Deaton Review, March 2022.
83 See pg.48-50 Department for Levelling Up, Housing and Communities, Levelling Up the United Kingdom, 2022. See also National Audit Office, Business support schemes, January 2020.
84 J Oliveira-Cunha et al., Business time: How ready are UK firms for the decisive decade?, The Economy 2030 Inquiry, May 2021
85 See Chapter 8, The Evidence Base for London's Local Industrial Strategy –Final report, Gla Economics, February 2020.

limited number of cities. These investments will need to be large given the scale of the UK's productivity gaps and they will need to be spatially targeted to generate the self-reinforcing feedback loops that explain London's big productivity advantage.

The alternative is to spread investments around. These investments could improve productivity in any area. However, there are many small towns, investment in infrastructure and innovation is costly, and for towns the self-reinforcing effects of size, skills, and capital are limited by the scale of the local economy. Of course, there will still be many projects that are worth pursuing outside our major cities, but a strategy that focuses too much on towns, rather than our major cities, will not scale up to produce large productivity improvements across lots of areas for lots of workers.

The mention of globally competitive cities in the levelling-up white paper (as part of mission 1) suggests that the government recognises the arguments for spatial concentration.[86] But the amounts of investment committed, the suggestion of a global city in each region and the political pressure to spread spending around, means that the strategy is a long way from fully embracing it.

An economic strategy aimed at narrowing productivity disparities must consider who gains from the strategy

Creating counterbalances to London and the South East will tend to benefit graduates rather than lower-wage workers.[87] Some of these benefits will trickle down to the lower-paid in the form of moderately higher wages and improved employment rates, but at the cost of more expensive housing. For talented children growing up in struggling towns, increased opportunities nearby offer the option of commuting or a small-distance move, making it easier to maintain links with family and friends left behind.[88] Sadly, while all these trickle-down benefits are possible, London – with its many poor neighbourhoods – points to the limits of this approach for improving outcomes for those at the bottom of the income distribution. A more equal spread of investment and of graduates – and globally competitive cities outside of London and the South East – may help reduce spatial disparities, but it is no simple fix for improving outcomes for poorer households. To do this, complementary investments must make sure that poorer households can access the opportunities generated.[89]

86 Mission 1 on increasing living standards states that "[b]y 2030, pay, employment and productivity will have risen in every area of the UK, with each area containing a globally competitive city." See pg.120 Department for Levelling Up, Housing and Communities, Levelling Up the United Kingdom, 2022.
87 Overman and Xu, Spatial disparities across labour markets, IFS Deaton Review, 2022, for more discussion
88 Qualitative work for the inquiry highlights the value of such opportunities to local communities. See: L Judge & D Tomlinson, All over the Place: Perspectives on local economic prosperity, Resolution Foundation, June 2022.
89 Overman and Xu, Spatial disparities across labour markets, IFS Deaton Review, 2022, for more discussion.

An additional issue arises once we recognise that the increased investments needed to narrow productivity disparities generate income for capital owners as well as workers. This raises the question: even if we could narrow productivity disparities, what would be the implications for overall disparities in income and living standards? At the national level we know that there is a strong link between productivity and income. The link is also quite strong at the broad regional level – for the twelve NUTS1 regions of the UK the correlation between productivity and incomes is 0.96.[90] However, as illustrated in Figure 18 the link is much weaker for smaller areas.

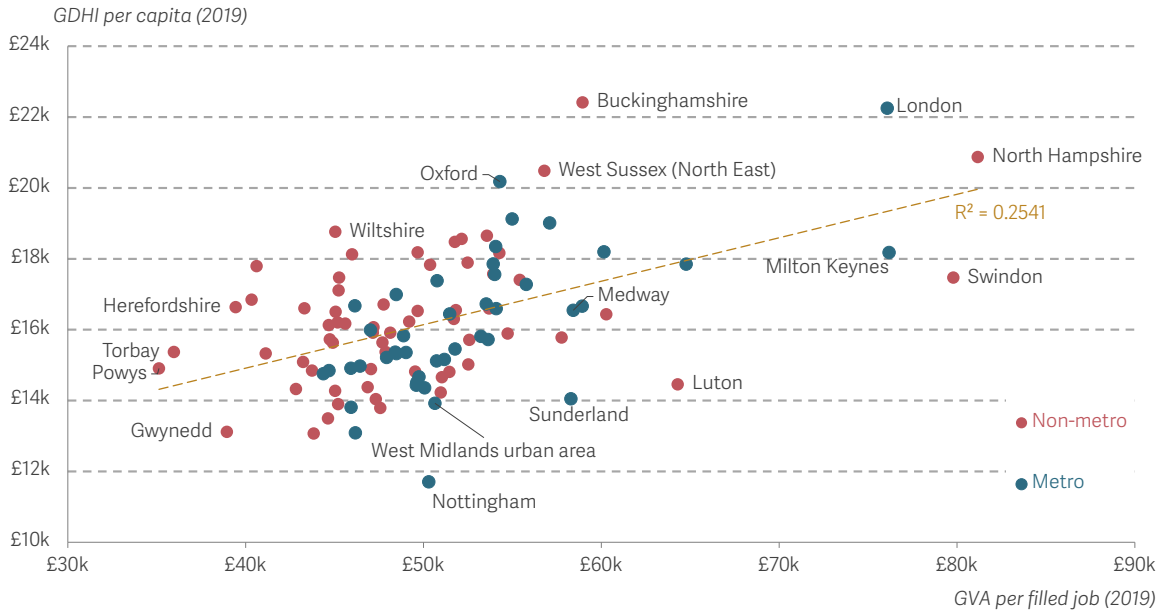
This weaker link between area productivity and area incomes is consistent with evidence presented elsewhere that the sorting of high-skilled workers explains much of the variation in wages and employment rates that we see across labour market areas.[91] Area differences in productivity play a role in explaining area differences in wages and employment, but variations in how much of this higher productivity goes to workers may matter more. And as is well known, the labour share is much bigger for high-skilled than low-skilled workers (as evidenced by the graduate wage premium).

Thinking about all sources of income - as we do in one of the companion pieces to this report[92] - identifies two further reasons for the weak link. First, the owners of factors of production used to produce output in one area may live in a different area. For example, a worker may live in the countryside, but work in a nearby city.[93] This is a particularly big issue for income from capital which is highly unevenly spread across the country - lots of owners of buildings, intellectual property, etc. do not live in the areas where this capital is being used. Second, areas have lots of people who do not directly rely on income that is generated through production. For example, overall incomes in areas with high populations of pensioner adults will be less linked to productivity and the resulting effects on wages, and instead be more strongly determined by pension income.[94]

90 See also figure 1.17, pg.23 and figure 1.31 pg. 83, Department for Levelling Up, Housing and Communities Levelling Up the United Kingdom, 2022.
91 Overman and Xu, Spatial disparities across labour markets, IFS Deaton Review, 2022, for more discussion
92 L Judge & C McCurdy, Incomes Outcomes: Assessing income gaps between places across the UK, Resolution Foundation, June 2022.
93 Of course, this distinction between where factors are used and where the owners of those factors live also matters for countries. But for most large developed countries, cross-border commuting flows are small, as are remittances from migrants working in other countries. Similar observations apply on capital given the extent of international equity bias.
94 Areas with high levels of elderly individuals will also tend to specialise in employment whose measured productivity is low – for example jobs in care or nursing.

FIGURE 16: **The link between area productivity and area incomes is not particularly strong**

GVA per filled job and GDHI per capita (cash measure), by area: 2019



NOTES: Cash measure of income previously developed by Resolution Foundation using the GDHI dataset. We set out our methodology out in detail in: L Judge & C McCurdy, Income Outcomes: Assessing income gaps between places across the UK, Resolution Foundation, June 2022. Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Gross Disposable Household Income.

Changes in the crucial decade and beyond

The coming decade of change – driven by Covid-19, Brexit and Net Zero – might change the balance of the economic forces that drive the UK's productivity disparities. However, it would be dangerous to assume that these changes will inevitably reduce - rather than increase – spatial disparities.

Investment fell substantially during the pandemic, as is the norm during any recession, let alone a pandemic that involved shutting down large parts of the economy. But the recovery has subsequently been weak: despite the economy exceeding its pre-pandemic size in 2022, business investment is still over 9 per cent below its peak.[95] At least part of this fall is likely to be explained by the increased uncertainty about the future of the economy brought about by Brexit. Regardless of the underlying cause substantial falls in investment present an additional headwind to an economy that needs increased investment to improve overall productivity at the same time as narrowing disparities. With investment stalling, the trade offs we identified in the previous section become more binding.

95 J Leslie, Bouncebackability:The UK corporate sector's recovery from Covid-19, Resolution Foundation Economy 2030 Inquiry, 2022.

Unfortunately, the most detailed assessment to date of the impact of the TCA on trade flows over the longer-term finds that adjustment over the next decade will decrease productivity across the country. While this has the potential to lower disparities (by levelling-down, rather than up) evidence suggests that this is unlikely to be the case.[96] For example, while the impact on London is uncertain, the North East, one of the poorest regions in the UK, is predicted to be one of the hardest-hit areas thus increasing existing (and large) productivity and income gaps. There is also some evidence that more productive London based firms are already responding more successfully to the new trade barriers with the EU by exploiting export opportunities outside the EU. Finally, it is unlikely that Brexit will see large structural shifts back to a more manufacturing intensive economy and the smaller spatial disparities that might imply.

For Covid-19, short-run effects continue to be felt in some parts of London and areas dependent on nearby airports. In contrast to Brexit, any long-run effects are likely to come through the impact of working from home (WFH), rather than persistent effects on investment levels.[97] Increased WFH will have impacts on the spatial distribution of work and spending, with some areas gaining, and others losing. Initial evidence suggests that those areas that are expected to do relatively well out of WFH – i.e., they have relatively many workers who can WFH but fairly few empty workplaces – tend to be relatively advantaged. In contrast, some of the worst-affected areas were already quite deprived. The long-term implications, once the economy adjusts, are highly uncertain. One thing that is clear is that the UK's unresponsive housing supply means that nearly all of the adjustment to changes in household preferences for different locations will come through changing house prices and area composition, rather than large scale shifts in the population. The impact on the distribution of employment is highly uncertain. While it is tempting to predict that WFH will see more jobs move out of city centres, this has not been the case as the spatial economy adjusted to recent falls in doing business at a distance (which have strengthened many city centre economies, rather than weakened them).

The effect of net-zero on inequalities between places might be more positive than that of Covid and Brexit. While a higher share of the UK's total net zero activity occurs in more-productive areas (such as Oxford, Cambridge and London) some less-productive areas (including Derbyshire and Nottinghamshire, Cornwall and the Isles of Scilly and Lincolnshire) appear to be more specialised in clean technologies, products or services.[98] This suggests that targeted investments in clean technologies, such as tidal,

96 S Dhingra et al., The Big Brexit, An assessment of the scale of change to come from Brexit, Resolution Foundation Economy 2030 Inquiry, June 2022.
97 J Leslie, Bouncebackability:The UK corporate sector's recovery from Covid-19, Resolution Foundation Economy 2030 Inquiry, 2022.
98 B Curran et al., Growing clean: Identifying and investing in sustainable growth opportunities across the UK, Resolution Foundation Economy 2030 Inquiry, May 2022.

offshore wind and carbon capture usage and storage (CCUS), located in less-productive regions, have the potential to contribute to narrowing productivity disparities. The resulting 'green' jobs also tend to require a more skilled worked force. As with other investments, as discussed above, the impact on local people will depend on the extent to which they are able to access the resulting opportunities. For many without a degree, complementary policies may be needed to ensure they can do so.

There are also interesting spatial patterns in the returns to investments in clean innovation, which provide another good example of the issues faced when considering redistributing R&D expenditure (as discussed in the previous section). Investments in certain clean technologies generate relatively high returns in less innovation-intense areas.[99] This is good news for levelling up because we need to find R&D investments in lower productivity areas that generate good returns. However, these investments generate little spillover to other areas, in contrast to support for these technologies in more innovation-intense areas which generate relatively high spillovers for the rest of the country (as well as returns in these areas themselves). Changing the spatial pattern of clean investment has implications for both area level productivity and the overall innovation rate.

The available evidence suggests that none of the changes we are likely to see over the next decade represent a silver bullet that will substantially narrow existing disparities. The UK's economic strategy needs to be realistic about the economic forces that polarise the UK, how they are evolving, and the scale of the interventions needed to reduce the resulting disparities. Understanding these forces, and dealing with the resulting trade offs, will be key to developing a successful economic strategy that improves aggregate economic performance while engaging seriously with spatial inequalities.

99 B Curran et al., Growing clean: Identifying and investing in sustainable growth opportunities across the UK, Resolution Foundation Economy 2030 Inquiry, May 2022

Section 6

Conclusion

This report has outlined what we know about productivity disparities across the country, the factors which determine them and what would be needed to reduce them. Spatial disparities are large and persistent, and slightly larger than they were at the start of the 2000s – although these changes are small relative to the level of disparities that persist throughout the period.

The UK's economic geography has been fundamentally shaped by de-industrialisation and the rise of a services-led economy. The transition from manufacturing to services made it inevitable that productivity gaps would open up between areas. However, it is far from clear that the scale of the gaps that the UK experiences today are inevitable. While policy will never eliminate the productivity gaps between UK cities, towns and villages, it could do more to address the weak performance of the UK's major cities outside of London.

Given our specialisms, improving the UK's productivity means bigger high value-added services sectors, and a wider range of cities succeeding with them. Achieving this means being honest about the scale of change required – it will require major investment, increases in skills and even city sizes.

The scale of the investment means an economic strategy faces important trade offs: first, whether and how quickly, national productivity should improve relative to spatial disparities narrowing; second, which places to invest in most aggressively (since not all places can be prioritised simultaneously).

When thinking about where to invest, it is important to recognise that London's economic advantages stem from the concentration of human, physical and intangible capital and from its economic size, and these factors are self-reinforcing. Given this, a strategy that wants to achieve meaningful reductions in productivity disparities will

require large, spatially-targeted investments in a limited number of cities.

A more equal spread of investment and of graduates may help reduce spatial disparities and improve productivity in cities and their surrounding areas, but it is no simple fix for improving outcomes for poorer households. Complementary investments must make sure that poorer households can access the opportunities generated.

The coming decade of change might change the balance of these economic forces. However, it would be dangerous to assume that these changes will do policy makers' job for them by reducing - rather than increasing – spatial disparities.

Policy makers need to be realistic about the economic forces polarising the UK. Understanding these, and dealing with the resulting trade offs, will be key to developing a successful economic strategy that improves aggregate economic performance while offering a hard, but plausible, path to closing regional inequalities.

Annex

Technical Appendix

TABLE A1: **Descriptive statistics of key variables**

	2019		2006	
	Mean	Standard Deviation	Mean	Standard Deviation
GVA per hour	£31.56	£4.45	£23.52	£2.91
GVA per job	£49,756	£7,631	£36,915	£5,081
Total employment	315,479	778,532	281,557	637,259
Graduate share	36.5%	6.4%	25.3%	4.6%
Capital per job	£122,509	£23,892	£80,117	£14,177
ICT equipment per job	£1,753	£692	£1,873	£791
Transport equipment per job	£3,684	£1,632	£3,038	£1,128
Intangible capital per job	£8,951	£7,902	£5,572	£4,966
Building capital per job	£99,833	£19,303	£61,578	£9,124
Other tangible capital per job	£8,288	£3,758	£8,057	£2,434

NOTES: All variables are three year moving averages. Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Annual population survey; ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data.

TABLE A2: **Correlation table of key variables**

	GVA per job	Total employment	Graduate share	Total capital per job	ICT equipment per job	Intangible capital per job	Transport equipment per job	Building capital per job	Other tangible capital per job
GVA per job	1	0.298	0.343	0.479	0.593	0.486	0.273	0.361	0.287
Total employment		1	0.088	-0.127	0.069	0.088	-0.118	-0.124	-0.209
Graduate share			1	0.132	0.204	0.232	0.086	0.050	0.240
Total capital per job				1	0.619	0.355	0.504	0.913	0.623
ICT equipment per job					1	0.330	0.367	0.482	0.675
Intangible capital per job						1	0.211	0.013	0.182
Transport equipment per job							1	0.367	0.370
Building capital per job								1	0.475
Other tangible capital per job									1

NOTES: All variables are three year moving averages in 2019. All variables apart from graduate share in log units. Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Annual population survey; ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data.

TABLE A3: **UK regression results (GVA per job)**

	2006				2019			
	GVA per job				GVA per job			
Employment	0.0335	0.0301	0.0293*	0.0199	0.0438**	0.0396**	0.0497***	0.0319**
	(0.0174)	(0.0154)	(0.0116)	(0.0112)	(0.0161)	(0.0136)	(0.00936)	(0.0107)
Graduate share		0.865***	0.350*	0.316		0.716***	0.558***	0.440**
		(0.248)	(0.164)	(0.173)		(0.160)	(0.159)	(0.158)
Capital per job			0.563***				0.384***	
			(0.0621)				(0.0831)	
ICT equipment per job				0.0646				0.195***
				(0.0437)				(0.0572)
Intangible capital per job				0.0422*				0.0701***
				(0.0162)				(0.0196)
Transport equipment per job				-0.0486				0.0169
				(0.0337)				(0.0399)
Building capital per job				0.553***				0.195**
				(0.117)				(0.0731)
Other tangible capital per job				-0.0105				-0.0749
				(0.0350)				(0.0449)
Constant	10.11***	9.928***	3.724***	3.746***	10.28***	10.07***	5.514***	6.487***
Adjusted R-Squared	0.052	0.099	0.639	0.686	0.079	0.173	0.402	0.548
N	98	98	98	98	98	98	98	98

NOTES: Standard errors in parentheses. All variables are three-year moving averages. All variables apart from graduate share in log units. * significant at the 5 per cent level, ** significant at the 1 per cent level, *** significant at the 0.1 per cent level. Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Annual population survey; ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data.

TABLE A4: UK regression results (GVA per hour)

	2006				2019			
	GVA per hour				GVA per hour			
Employment	0.0188	0.0155	0.0147	0.0101	0.0334*	0.0291*	0.0385***	0.0253*
	(0.0175)	(0.0157)	(0.0120)	(0.0116)	(0.0152)	(0.0128)	(0.00949)	(0.0101)
Graduate share		0.834***	0.373*	0.332		0.731***	0.584***	0.458**
		(0.242)	(0.164)	(0.172)		(0.144)	(0.153)	(0.156)
Capital per job			0.503***				0.357***	
			(0.0591)				(0.0826)	
ICT equipment per job				0.0212				0.158**
				(0.0464)				(0.0527)
Intangible capital per job				0.0272				0.0601**
				(0.0156)				(0.0178)
Transport equipment per job				-0.0525				-0.00140
				(0.0338)				(0.0368)
Building capital per job				0.497***				0.184*
				(0.132)				(0.0776)
Other tangible capital per job				0.0641				-0.0314
				(0.0327)				(0.0444)
Constant	2.926***	2.754***	-2.793***	-3.069*	3.041***	2.825***	-1.406	-0.555
Adjusted R-Squared	0.013	0.105	0.588	0.618	0.049	0.161	0.387	0.494
N	98	98	98	98	98	98	98	98

NOTES: Standard errors in parentheses. All variables are three-year moving averages. All variables apart from graduate share in log units. * significant at the 5 per cent level, ** significant at the 1 per cent level, *** significant at the 0.1 per cent level. Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Annual population survey; ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data.

TABLE A5: **EU regression results (size only)**

	GVA per Job				
	DE	ES	FR	IT	UK
Employment	0.064***	0.017	0.091***	0.070***	0.045**
	(0.009)	(0.011)	(0.01)	(0.014)	(0.015)
Constant	10.268***	10.662***	9.952***	10.123***	10.240***
	(0.1)	(0.124)	(0.12)	(0.165)	(0.181)
Observations	260	49	88	104	98

NOTES: Standard errors in parentheses. All variables are three-year moving averages in 2018. All variables in log units. * significant at the 5 per cent level, ** significant at the 1 per cent level, *** significant at the 0.1 per cent level. Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas. GVA per worker for all countries apart from the UK.
SOURCE: Analysis of OECD, Regional Economy Database.

TABLE A6: **EU regressions results (size and skills)**

	GVA per job				
	DE	ES	FR	IT	UK
Employment	0.057***	-0.016	0.070***	0.050***	0.042***
	(0.01)	(0.008)	(0.012)	(0.014)	(0.012)
Graduate share	0.002	0.015***	0.005**	0.015***	0.007***
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Constant	10.317***	10.727***	10.070***	10.134***	10.010***
	(0.105)	(0.084)	(0.119)	(0.161)	(0.171)
Observations	260	49	88	104	98

NOTES: Graduate shares are in percentage terms in this regression rather than decimals. Standard errors in parentheses. All variables are three-year moving averages in 2018. All variables in log units. * significant at the 5 per cent level, ** significant at the 1 per cent level, *** significant at the 0.1 per cent level. Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas. GVA per worker for all countries apart from the UK.
SOURCE: Analysis of OECD, Regional Economy Database.

TABLE A7: **UK regression results with interactions**

	GVA per job
Employment	0.228
	(0.873)
Graduate share	3.257
	(14.97)
Capital per job	0.848
	(0.766)
Employment * Capital per job	-0.0247
	(0.0741)
Employment * Graduate share	0.281
	(0.142)
Graduate share * Capital per jo	-0.520
	(1.261)
Constant	1.415
	(9.170)
Adjusted R -Squared	0.399
N	98

NOTES: Standard errors in parentheses. All variables are three year moving averages ending in 2019. All variables apart from graduate share in log units. * significant at the 5 per cent level, ** significant at the 1 per cent level, *** significant at the 0.1 per cent level. Spatial units are a combination of OECD metro areas and NUTS 3 for non-metro areas.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Annual population survey; ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data

FIGURE A1: **The changes to eliminate the productivity gap between Manchester and London are more impactful accounting for interactions**

GVA per job of Manchester with different levels of total capital, graduate share and total employment compared to London: 2019

NOTES: All values are 3-year moving averages ending in 2019.
SOURCE: Analysis of ONS, Subregional productivity; ONS, Annual population survey; ONS, Experimental regional gross fixed capital formation estimates by asset types; EUKLEMS, Capital input data.

Data Appendix

Geography

The ONS produces measures of regional gross value added per capita for three sets of 'nested' administrate units. The 12 largest regions are territorial level 1 or TL1. They are made up of 9 regions in England and the 3 countries of Northern Ireland, Scotland, and Wales. The 41 TL2 regions break up TL1 into smaller regions and the 179 TL3 regions similarly break up TL2.

These territorial levels follow Eurostat guidelines, ensuring comparability across countries. However, the boundaries of TLs are still determined by national administrative boundaries that do not approximate the underlying economic boundaries of cities well. People and goods often flow beyond the official city limits into neighbouring areas. For this reason, as discussed in the text, to study the differences in productivity of areas, we need to use areas that approximate economic boundaries.

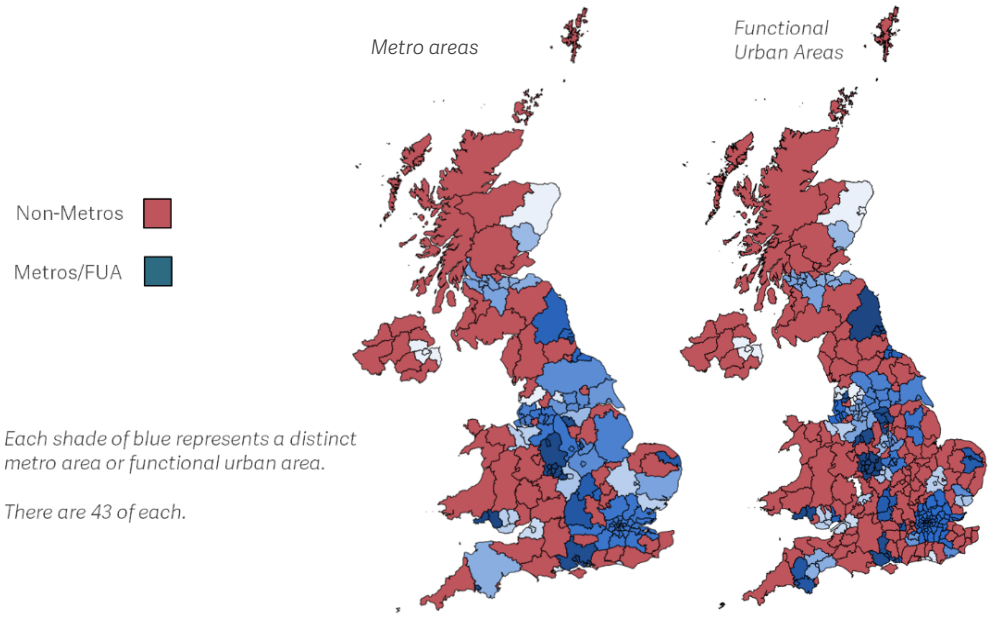
The OECD and Eurostat developed the concept of Functional Urban Areas (FUAs) to approximate integrated labour and goods markets. FUAs are composed of two areas: cities and their commuting zone. To define the city, first an urban core is located using grid-level data on population and population density. Urban cores correspond to a cluster of contiguous cells of more than 1,500 residents per square kilometre and over 50,000 residents in total. This urban centre is then allocated to the administrative local unit that best approximate it. This area corresponds to the city. Commuting flows are then used to identify the commuting zone: a local unit is included in the commuting zone if at least 15 percent of its employed residents work in the city.

Most of the data we use is originally available at the ITL3 level. To use this at FUA level needs a mapping from NUTS to FUAs. To do so, we relied on metro areas. Metro areas, as defined by Eurostat, are approximated by FUAs of 250,000 residents or more using aggregations of NUTS3 areas. If any NUTS3 contains a FUA of over 250,000 residents, it is considered a metro area. If for any adjacent NUTS3 area, 50 percent of the population also lives in the FUA, that NUTS3 is also included in the metro area.

Some FUAs are better approximated by metro areas than others. Given that FUA are based on local authority districts, another approach would be to use data at the LAD level. However, data on capital is not currently available at that level. We therefore use metro areas based on NUTS3 throughout our analysis. Figure A2 maps NUTS 3 and metros (left-panel) and LADs and FUAs (right-panel).

Figure A2: Metro areas are a good approximation of functional urban areas

Map of Metro and Non-Metro areas (left panel), and Functional Urban Areas (right panel): UK, 2021



NOTES: Each shade of blue represents a different metropolitan area or functional urban area.
SOURCE: Analysis of Eurostat, Metropolitan regions dataset and Local Administrative Units dataset.

While most of our data is originally at the ITL3 2021 level graduate share is only at the LAD 2021 level. To convert it to NUTS3, we use a crosswalk from the ONS. Most of the LADs match with only one NUTS3. However, three LADs match with two or three different ITL3. In order to deal with this issue, we used the employment data at the ITL3 level to split data at the LAD into the different ITL3. For example, the Highlands LAD matches with three different ITL3 regions. We obtain the share of employment for each ITL3 out of the total sum of employment in the three ITL3 regions. We then multiply the total number of individuals with NVQ4+ and the number of 16-64 individuals at the LAD level with this share of employment. This allows us to distribute the graduate share between the different ITL3 areas. The other two LADs that are split in this way are North Ayrshire and Argyll and Bute.

Our final sample consists of 106 areas, of which 43 are metros and 63 are NUTS3 regions. We then remove the 8 regions in Northern Ireland since no data is available for them for graduate shares or for GVA per hour. This leaves us with 56 NUTS3 and 42 metro areas, for a total of 98 regions.

Data sources

Details of the different variables that we use, the definition, geographical level, time period and source are detailed in Table A8. Three sections below provide additional information on GVA per job, on capital stocks, and on the measure of proximity to other large economies.

Table A8: Data definitions and sources

Variable	Definition	Geography level	Time period	Source
GVA per filled job	Nominal (smoothed) GVA (balanced) per filled job	ITL3 (2021)	2002-2019	ONS, Subregional productivity: labour productivity indices by UK ITL2 and ITL3 subregions
Total employment	Number of employed individuals	LAD (2021)	2004-2021	NOMIS, Annual Population Survey
Graduate share	Percentage of 16-64 who hold a NVQ4 degree or above	LAD (2021)	2004-2021	NOMIS, Annual Population Survey
Investment	Gross fixed capital formation estimates by asset types	ITL3 (2021)	1997-2020	ONS experimental regional Gross fixed capital formation estimates by asset types
Initial capital stock	Nominal capital stock, in millions of national currency, by asset type	National	1997-2015	EUKLEMS Capital input data
Depreciation rate	Depreciation rate by industry and asset type	National	2017 release	EUKLEMS Capital input data (depreciation rate)

GVA per job filled

As our main measure of productivity, we use GVA per job filled. This data is provided by the ONS at the ITL3 2021 level, from 2002 to 2019. GVA at the national level is apportioned to subregional areas using regional indicators, which vary depending on the components of GVA. For example, output information for each industry is divided up between regions based on output levels at the ITL3 level using the Annual Business Survey.

Since 2017, the ONS produces a balanced approach to GVA per job filled. It uses both the income and production approach and combines both measures using quality metrics as weight. The aim of this new measure is to combine the strength of both measures while producing only one estimate of GVA by region.

The denominator, calculated by the ONS, includes employee jobs (from the Business Register and Employment survey), self-employed jobs (from the Annual Population survey), government-supported trainees (GST, from the Department for Education and Department for Work and Pensions), and members of Her Majesty's Forces (from the Ministry of Defence). Each number is apportioned to local authority district (LAD) levels of geographies using a workplace measure of jobs. These LAD-level estimates are then aggregated up to ITL3 geographies.

Capital stock measure

The ONS provides data on gross fixed capital formation estimates in current prices for the years 1997 to 2019, split by asset type and 1 digit industry at the ITL3 regions. Gross fixed capital formation is a measure of net investment in that assets type, since it refers to the value of acquisitions less disposals of fixed assets during a given period.

The asset types provided by the ONS, and included in our regression analysis, are the following: buildings and structures, ICT equipment, transport equipment, intangible assets (including R&D) and other tangible assets.

To construct a measure of total capital we use the Perpetual Inventory Method, assuming geometric depreciation at a constant (over time) rate . We allow for the depreciation rate to vary between asset types. Information on the depreciation rate by asset type and industry are available from the EUKLEMS dataset.[100] The capital stock is constructed following the Perpetual Inventory method.

The full methodology for this section can be accessed at:
resolutionfoundation.org/app/uploads/2022/06/Bridging-the-gap-Additional-Annex.pdf

Measure of proximity to other large local economies

To capture the agglomeration economies experience due to proximity to other large local economies we construct a measure of market access. For each area, the market access measure (MA) sums the GVA from all other places in the UK, giving more weight to closest neighbours and smaller weight to distant locations. This means, for example, that London total GVA generates agglomeration economies (via market access) for close locations – e.g. Luton or North Hampshire – but not for distant areas – e.g. Dundee or the Shetland Islands.

The full methodology for this section can be accessed at:
resolutionfoundation.org/app/uploads/2022/06/Bridging-the-gap-Additional-Annex.pdf

EU regressions

Information on the data used for the EU regressions is available on request.

100 We create a dataset with the (average) depreciation rate by asset type at the 1 digit industry using the EUKLEMS depreciation rates. UKCapital17 dataset B van Ark and K Jäger, Recent Trends in Europe's Output and Productivity Growth Performance at the Sector Level, 2002-2015, International Productivity Monitor, Number 33, 2017

Reports published as part of The Economy 2030 Inquiry to date

All publications are available on the Inquiry's website.

1. The UK's decisive decade: The launch report of The Economy 2030 Inquiry
2. Levelling up and down Britain: How the labour market recovery varies across the country
3. Work experiences: Changes in the subjective experience of work
4. The Carbon Crunch: Turning targets into delivery
5. Trading places: Brexit and the path to longer-term improvements in living standards
6. Home is where the heat (pump) is: The Government's Heat and Buildings Strategy is a welcome step forward but lower-income households will need more support
7. Business time: How ready are UK firms for the decisive decade?
8. Begin again? Assessing the permanent implications of Covid-19 for the UK's labour market
9. More trade from a land down under: The significance of trade agreements with Australia and New Zealand
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16. Shrinking footprints: The impacts of the net zero transition on households and consumption
17. Enduring strengths: Analysing the UK's current and potential economic strengths, and what they mean for its economic strategy, at the start of the decisive decade
18. Listen up: Individual experiences of work, consumption and society
19. Growing clean: Identifying and investing in sustainable growth opportunities across the UK
20. Low Pay Britain 2022: Low pay and insecurity in the UK labour market
21. Bouncebackability: The UK corporate sector's recovery from Covid-19
22. All over the place: Perspectives on local economic prosperity
23. Right where you left me? Analysis of the Covid-19 pandemic's impact on local economies in the UK
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The Inquiry is a collaboration between the Resolution Foundation and the Centre for Economic Performance at the London School of Economics. It is funded by the Nuffield Foundation.

For more information on The Economy 2030 Inquiry, visit economy2030.resolutionfoundation.org.

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Funded by
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