

UK Regional Productivity Differences: An Evidence Review

Industrial Strategy Council



Research Paper

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February 2020

About the Industrial Strategy Council

The Industrial Strategy Council ('the Council') is an independent non-statutory advisory group established in November 2018. It is tasked with providing impartial and expert evaluation of the government's progress in delivering the aims of the Industrial Strategy. Its membership is comprised of leading men and women from business, academia and civil society.

Acknowledgements

This work was overseen by Council members Kate Barker, Emma Bridgewater, Christine Gaskell and Rotha Johnston.

The Industrial Strategy Council would like to thank the research and secretariat team for their contribution to this research paper. The paper has benefited greatly from comments, suggestions and input by the Department for Business, Energy and Industrial Strategy (BEIS), the Ministry of Housing, Communities and Local Government (MHCLG), HM Treasury, the Productivity Insights Network (PIN), as well as Nicolás González-Pampillón, Jane-Frances Kelly, Pauline Leonard, Philip McCann, Mark Mitchell, Henry Overman, Andrei Potlogea, Richard Prothero, Alasdair Rae, Capucine Riom, Graeme Roy, Paul Swinney and Tim Vorley. Robert Zymek gratefully acknowledges financial support from the Economic and Social Research Council (ESRC) under the University of Edinburgh's Impact Acceleration Account. Ben Jones completed the work whilst on secondment to the Industrial Strategy Council from the Confederation of British Industry (CBI).

Foreword

Tackling regional and spatial disparities across the UK has risen to the very top of the public policy priority list. For the new Government, this is the so-called “levelling-up” agenda. It is not difficult to see why. Regional and spatial disparities are larger in the UK than in most other Western European Countries. And they have risen to their highest levels in more than a century.

This research paper by Robert Zymek and Ben Jones, published under the auspices of the Industrial Strategy Council, brings together comprehensively the evidence we have on both the causes of these regional disparities and the effectiveness of policies to address them. It draws on extensive experience and evidence, not just from the UK but internationally too.

Regional differences typically have deep roots and are long-lasting. They emerge in an evolutionary fashion due to the complex interplay of various factors acting in a self-reinforcing cycle - transport, education, skills, innovation, housing, civic and community infrastructure. For well-performing places, this is a virtuous circle. For left-behind places, it is a vicious one.

Past experience suggests that closing these differences, or reversing those vicious cycles, takes time. There is rarely a simple or singular policy means of doing so. But the evidence also clearly suggests that reversing the cycle of stagnation is possible provided policy measures are large-scale, well-directed and long-lived. Historically in the UK, none of these conditions has been satisfied.

I hope this report can serve as a useful contribution to our collective understanding of this crucial issue in the UK. I also hope, more ambitiously, that it can help the Government in designing and implementing a policy response equal to that challenge.

Andy Haldane, Chair of Industrial Strategy Council

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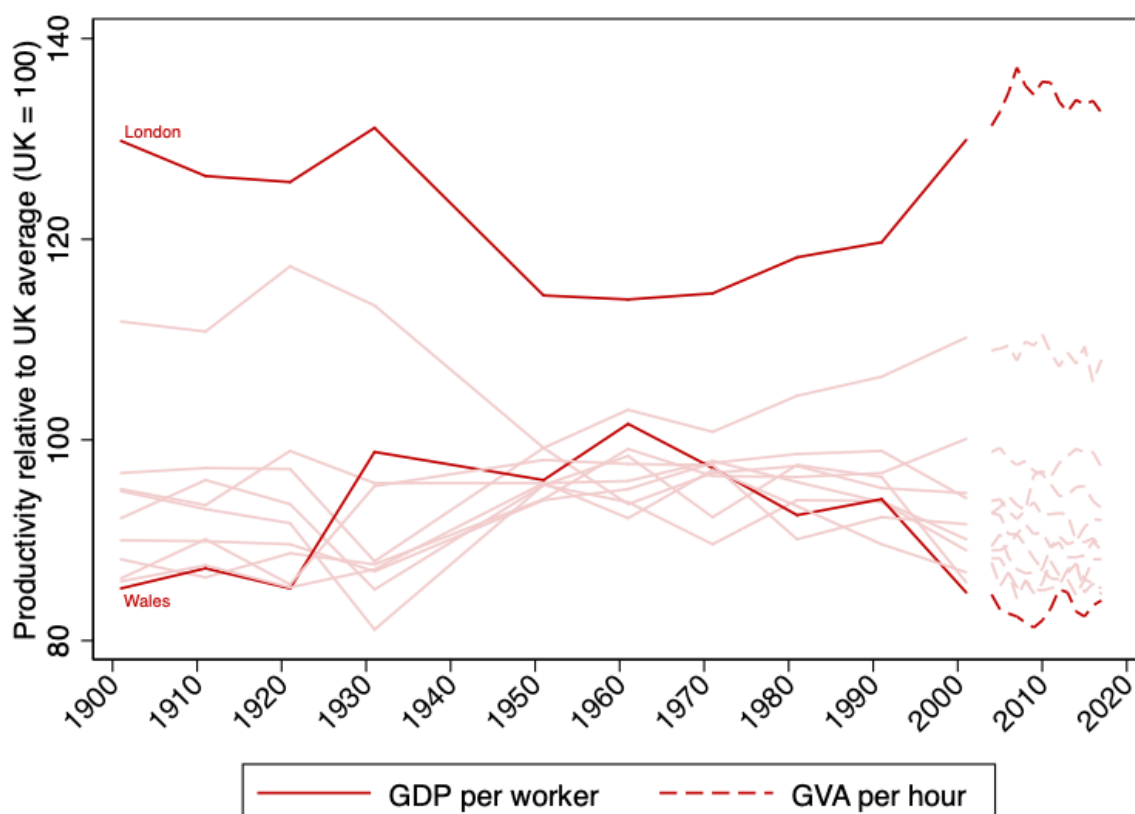
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Executive Summary

This evidence review examines the nature and causes of differences in economic performance across UK regions. It focuses on one key measure of economic performance: productivity. Productivity is an important headline indicator of a region’s economic performance because it captures the possible economic rewards from work in a region.

Differences in productivity across UK regions are large, in absolute terms and by international standards. The UK has a long history of regional disparities in income and productivity. Regional differences in per-worker incomes were about as large in 1901 as they are today. There was a period of regional convergence during the mid-20th century, but this was reversed during the 1980s and 1990s (see Figure 1). Since 2008, productivity differences between broad NUTS1 regions – the nine statistical regions of England, as well as Wales, Scotland and Northern Ireland – have decreased slightly. But productivity differences *within* these regions have risen.

Figure 1: UK regional productivity differences between 1901 and 2017



Sources: Geary and Stark (2016), ONS (2019a). See Section 3.1 in the main text for details.

Three patterns are apparent in recent regional productivity trends:

1. A number of cities are among the places with the highest productivity levels and growth rates in the country, but not all cities are doing well.
2. Coastal areas are among the regions with the lowest productivity levels, and they appear to be falling further behind the rest of the country.
3. The membership of a place in a broader regional “club” still appears to be an important determinant of its productivity and living standards.

In principle, differences in productivity across regions can be attributed to differences in any one of the following: workforce skill and health; productive assets and infrastructure; local geography and institutions; the composition of economic activity. In practice, high-productivity regions outperform low-productivity regions along *all* these dimensions: they have a better-skilled workforce, better local governance and management culture, attract more investment, and are more likely to be engaged in high-value activities. This makes it more difficult to diagnose the root causes of regional disparities.

There are three main narratives about the deep roots of spatial productivity differences in the literature. In practice, all three are likely to account for a portion of the regional variation in productivity observed in the UK.

- **Place Fundamentals** - geography, local culture, governance and infrastructure are important determinants of the economic activities in which different places engage. In turn, the resulting production mix shapes the nature of the local workforce, the type and volume of private investments a place can attract, and a region’s productivity level.
- **Agglomeration** - some places have been able to attract clusters of economic activity which have become self-sustaining as a result of a circular economic logic. Agglomeration is associated with two types of productivity benefits: “localisation economies”, whereby specialised firms benefit from the ability to trade and interact with other firms in their industry that form part of the same cluster, and “urbanisation economies”, whereby firms benefit from sharing the specific common resources offered by large cities.
- **Sorting** - workers (especially highly skilled workers) – choose where to live and work, and they tend to choose places with residents similar to themselves. As a result, small initial differences between places may give rise to large disparities of people across space – shaping regions’ industry mix, investment attractiveness and, ultimately, productivity.

Over the past decades, successive governments have sought to raise UK productivity and address regional disparities. However, the institutions and targets of UK regional policy have been in constant flux. The Government’s Industrial Strategy, published in 2017, represents an opportunity to introduce a new degree of continuity

into UK regional policy. It aims to reduce regional productivity disparities and endeavours to create “prosperous communities throughout the UK”.

Under the Industrial Strategy, Mayoral Combined Authorities and Local Enterprise Partnerships are working with government to develop Local Industrial Strategies. With the publication of the first of these strategies, the question arises how their proposals should be evaluated and what would constitute place-based success for the Industrial Strategy. The review of the evidence presented in this document suggests that place-based policies should:

- introduce a new degree of continuity into UK regional policy to ensure a strategic approach to achieving long-term economic goals. This is particularly important given the tendency to abolish and re-create regional-policy institutions.
- seek to foster local growth strategies that are robust to the different narratives outlined above, employing a holistic approach across a range of policy interventions and success metrics.
- keep the spotlight on places whose productivity levels and growth rates are well below the national average, to ensure that interventions are directed towards places at risk of falling further behind the country as a whole.

The review also highlights three substantial evidence gaps that limit our understanding of regional differences in the UK – with respect to regional price differences, capital stocks and indicators of well-being at local level. The Industrial Strategy Council supports the creation, use and dissemination of empirical data that fills these gaps.

1 Productivity Differences Across Space: The UK Evidence

1.1 UK Regional Productivity Differences

This evidence review examines the nature and causes of differences in economic performance across space in the UK. There is a large range of alternative indicators by which performance could be measured – but in the following, we will focus mainly on productivity. The Government’s 2017 Industrial Strategy White Paper noted that:

“unless we improve productivity . . . , we cannot raise living standards and quality of life for all our citizens”. It also observed that ‘the United Kingdom has greater disparities in regional productivity than in other European countries’ and sets the goal of improving the foundations of productivity ‘in all parts of the country’.”¹

A region’s productivity is measured as total regional income in a given period (typically a year) divided by the total number of hours worked in the region over the same period. It thus corresponds to the income generated by the average hour of work. This income encompasses not only the wages received by workers, but also rental income from machinery, equipment and real estate, and income from profits.

While productivity is not a flawless indicator of a region’s economic performance (see Box 1), it is nevertheless considered an important economic statistic. If one region is more productive than another, it suggests that its workers, landlords and entrepreneurs may be able to enjoy the benefits of higher incomes while working the same number of hours, or to enjoy the same level of income while working less.

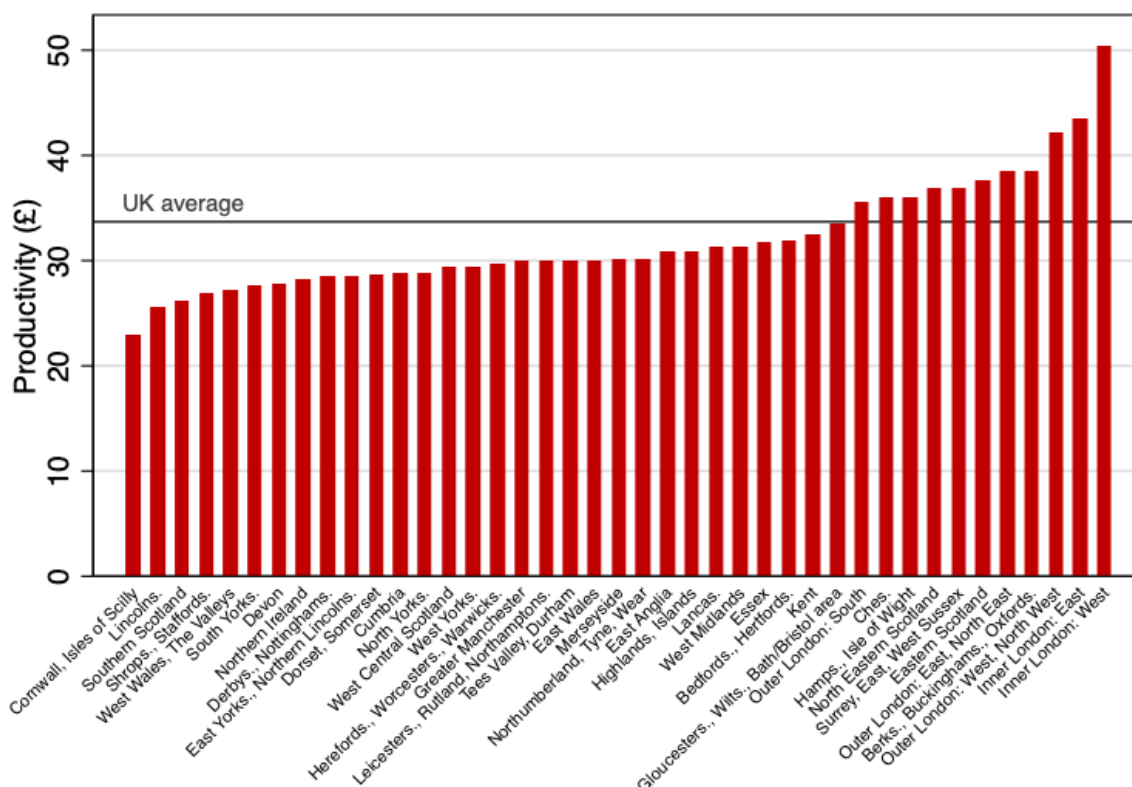
Differences in productivity across UK regions are relatively large. Figure 2 shows the income earned by an average work hour across 41 regions in 2017. These regions correspond to small groups of counties, unitary authorities and council areas. They are categorised for statistical purposes under the label “NUTS2 regions” (see Box 2). In the figure, Northumberland in the North East of England sits in the middle of the UK’s regional productivity distribution, with an average hour of work generating £29 in income.

To appreciate the scale of UK regional productivity differences, note that the most productive region (West Inner London) has an income per hour which is 70% higher than Northumberland’s. West Inner London includes the City of London and the

¹ HM Government (2017). *Industrial Strategy White Paper: Building a Britain Fit for the Future*, November. Retrieved from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf

London borough of Kensington and Chelsea, one of the richest boroughs in the UK. The least productive region, Cornwall, has an income per hour which is 25% lower than Northumberland's. Cornwall, which is heavily dependent on tourism is one of the poorest regions in the UK.

Figure 2: Productivity across NUTS2 regions in the UK in 2017²



Source: ONS (2019a).

A noteworthy feature of UK regional productivity data is that average regional productivity, equal to £34 (see Figure 2), is significantly higher than productivity of the “middle” region, Northumberland. This is because a small number of highly productive places (most notably Inner London) inflate average productivity statistics. This is reflected in Figure 2, which shows that only 11 out of 41 NUTS2 regions have productivity higher than the UK average.

The UK’s spatial disparities in productivity are not only large in an absolute sense, they are also large in comparison with other developed economies. Figure 3 compares a measure of productivity disparities across NUTS2 regions for the UK with 18 EU countries. The measure corresponds to the ratio between the most

² Productivity is measured as gross value added (GVA, in £) per hour.

productive region in a country and the least productive region. Larger values are indicative of greater spatial disparities.

Box 1: Regional productivity – How is it measured? What does it tell us?

There is a range of different ways to measure productivity. The most widely used statistic calculates productivity of a geographic area as its total income over a given period divided by total number of hours worked in the area over the same period.³ Total income refers to *all* the income earned in a region: not only wage income, but also rental income from machinery, equipment and real estate, and income from profits. The preferred measure of total income is either Gross Domestic Product (GDP), or Gross Value Added (GVA) which equals GDP plus any (net) subsidies received. For regions within countries, these statistics are collected by national statistical agencies as part of their regional economic accounts.

Information on hours worked in a region is derived from labour force statistics and business surveys. When hours worked cannot be estimated at the regional level, productivity is sometimes calculated as income per job, or income per worker. Occasionally, income per capita, which is income divided by a region's resident population, is used synonymously with productivity. However, this is problematic as people may live in one region but commute to work in another, so the number of residents may be a poor guide to how much work is being done locally.

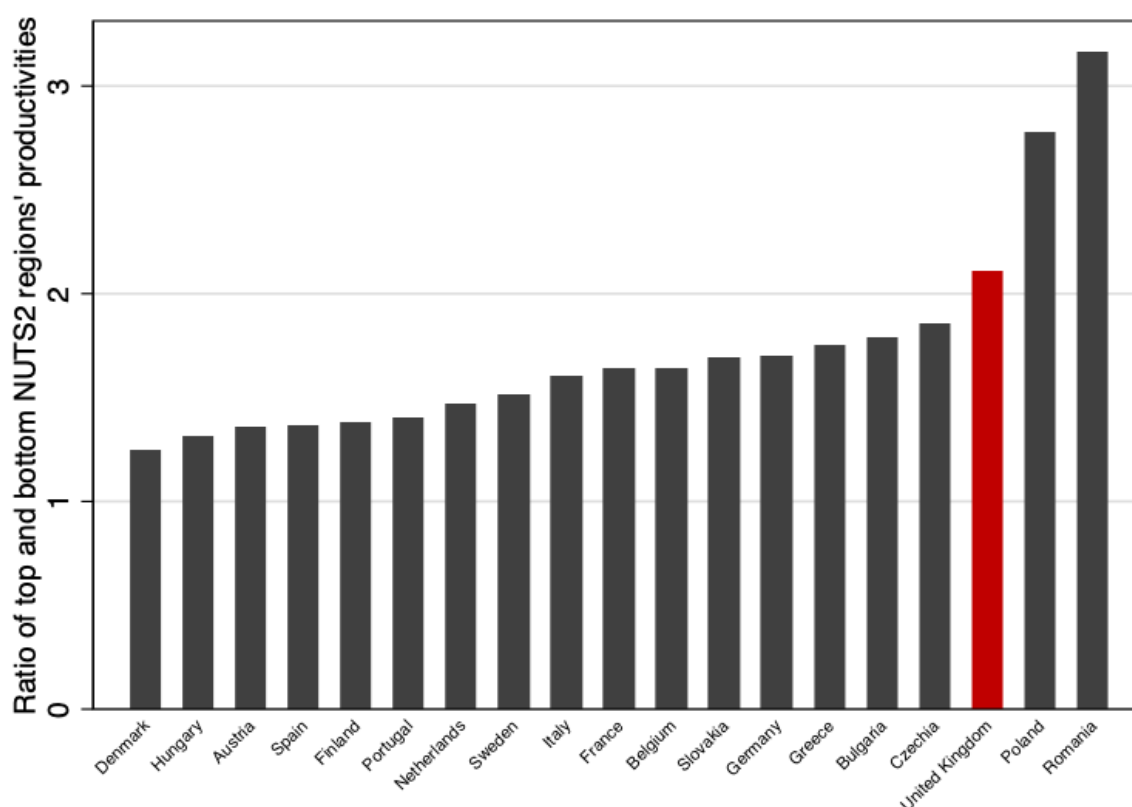
Economists consider productivity an important headline statistic to gauge economic performance. This is because they assume that people value both greater consumption possibilities and more free time. Higher productivity may make it possible for a region's workers to enjoy more consumption for the same amount of work; or to reduce their work hours without sacrificing consumption. Of course, there are many other factors besides consumption and the number of work hours which affect people's well-being such as the quality of work, their access to public services, the state of the natural environment, and the strength of their social ties. Productivity statistics do not speak directly to these. Yet, in practice, high-productivity regions also tend to perform well along many other economic and social indicators, making them more desirable places to work and live generally (see Section 1.2).

Like all economic statistics, productivity may be measured with error. The calculation of regional GDP, GVA and hours combine hard data with statistical

³ For alternative ways to measure productivity, see Combes, P.-P., and L. Gobillon (2015). "The Empirics of Agglomeration Economies," in Duranton G., Henderson, J. V., and W. C. Strange (eds.) *Handbook of Regional and Urban Economics*, 5, 5, pp. 247-348, Elsevier. Retrieved from: <https://doi.org/10.1016/B978-0-444-59517-1.00005-2>

techniques and judgement.⁴ As a result, productivity figures may capture true productivity only imperfectly. Moreover, since productivity statistics rely on measures of GDP, they are open to the same criticisms which have been levelled at GDP as a measure of economic success.⁵

Figure 3: Regional productivity disparities in the UK and 18 EU countries in 2017⁶



Source: Eurostat (2019)

Figure 3 reveals the UK to be one of the most spatially imbalanced European countries. Only Romania and Poland have larger productivity gaps between the most and least productive NUTS2 regions. However, these countries are both significantly smaller in terms of population and less economically developed than the UK.

⁴ ONS (2019a), *Regional and Sub-Regional Productivity in the UK*, February. Retrieved from: <https://www.ons.gov.uk/economy/grossvalueaddedgva/bulletins/regionalgrossvalueaddedbalanceduk/1998to2017>

⁵ For more on this see, for example, D. Coyle (2017), "Rethinking GDP," *Finance & Development*, 54, 1, pp. 16-19. Retrieved from: <https://www.imf.org/external/pubs/ft/fandd/2017/03/pdf/coyle.pdf>

⁶ Productivity is measured as gross domestic product (GDP, in purchasing-power adjusted euros) per hour. Bars represent the ratio between the most productive NUTS2 region in a country relative and the least productive NUTS2 region. The figure shows all countries for which 2016 Eurostat data on regional GDP and hours is available and which have at least 4 NUTS2 regions. Extra-European territories are not included. The ratios are somewhat sensitive to how countries are split up, though the overall conclusions stand

Notably, the UK's top-bottom productivity gap is larger than the corresponding gaps of Spain, Italy, France and Germany, despite Germany's large and persistent East-West productivity divide.⁷

The magnitude of UK regional economic differences has been noted in numerous studies and reports. A 2019 article by Philip McCann of Sheffield University compares regional inequality across OECD countries by calculating a range of different indices of inequality in regional income per capita using different data sources and for different definitions of regions. Per-capita income differs from the productivity measure used throughout this document (see Box 1), but it is closely correlated. Philip McCann's analysis reaches the conclusion that, in per-capita income terms:

“the UK is one of the most interregionally unequal countries in the industrialised world, and almost certainly the most interregionally unequal large high-income country.”⁸

A 2011 evidence review by the UK Commission for Employment and Skills concluded that the “spatial variation in prosperity in the UK remains high compared to that in many other European countries”.⁹ A 2017 study by UK-based academics for the European Commission paints a similar picture. It groups European regions into “clubs” of very high, high, medium and low income per head. The study finds that West Wales, the Valleys, and Tees Valley in the UK are among the small number of low income-per-head regions in Western Europe. By contrast, the study found no regions belonging to this low-income “club” in Germany, Sweden or Finland.¹⁰

In a 2018 country report, the International Monetary Fund (IMF) notes that there are “long-standing disparities in labour productivity across UK regions”, which are “large compared to other advanced economies”.¹¹ The IMF argues that interregional inequality in the UK is likely related to overall inequality, and may signal untapped economic potential in underperforming places. On this basis, it goes on to conclude

⁷ Burda, M. C., and S. Battista (2017). “Total Factor Productivity Convergence in German States since Reunification: Evidence and Explanations,” *Journal of Comparative Economics*, 46, 1, pp. 192-211. Retrieved from: <https://doi.org/10.1016/j.jce.2017.04.002>

⁸ McCann, P., 2019. “Perceptions of Regional Inequality and the Geography of Discontent: Insights from the UK,” *Regional Studies*, forthcoming. Retrieved from: <https://doi.org/10.1080/00343404.2019.1619928>

⁹ UK Commission for Employment and Skills (2011). *Rebalancing the Economy Sectorally and Spatially: An Evidence Review*, August. Retrieved from: <https://pdfs.semanticscholar.org/c367/f6250d1ba1be0a14fce859e9461f4fcc83e4.pdf>

¹⁰ Iammarino, S., Rodríguez-Pose A., and M. Storper (2017). “Why Regional Development Matters for Europe's Economic Future,” *European Commission Working Paper 07/2017*, July. Retrieved from: https://ec.europa.eu/regional_policy/sources/docgener/work/201707_regional_development_matters.pdf

¹¹ IMF (2018). *Country Report No. 18/43: United Kingdom*, February. Retrieved from: <https://www.imf.org/en/Publications/CR/Issues/2018/02/13/United-Kingdom-Selected-Issues-45628>

that “boosting labour productivity in underperforming regions would promote faster and more inclusive growth”.

As noted above, NUTS2 regions correspond to groups of counties, unitary authorities and council areas. While productivity varies between these regions, there are also productivity differences *within* local economies. For this reason, the definition of a “region” matters for how we think about UK regional disparities. To give a sense of this, Figure 4 reproduces the distribution of productivity across NUTS2 regions already shown in Figure 2 (light blue squares). However, it overlays this with productivity statistics for more narrowly defined geographic areas, referred to as “NUTS3 regions”, which are closer to actual UK counties, unitary authorities and districts. Each NUTS2 region contains between 1 and 8 NUTS3 regions, and their productivity is represented by the grey dots in Figure 4.

Box 2: Defining Regions

There are different ways to define the boundaries of regions within countries. Throughout this document, the regional definitions of the Nomenclature of Territorial Units for Statistics (NUTS) will be used most frequently as NUTS regions have a wide range of reliable standardised statistics associated with them which facilitate regional comparisons.

NUTS regions are defined predominantly in administrative terms, and there are three levels of NUTS regions. For the UK, these levels are defined as follows:

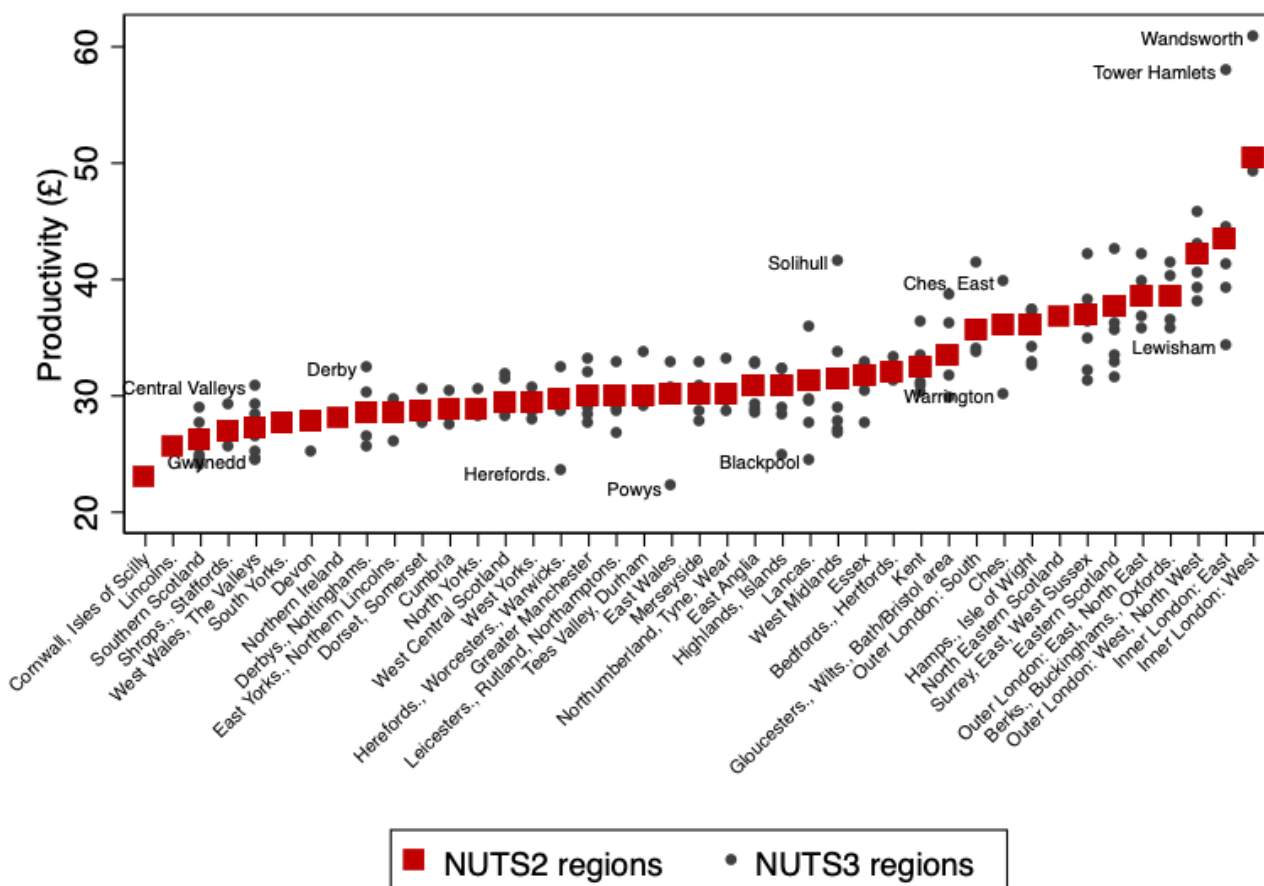
- **NUTS1** regions correspond to the 9 statistical regions of England, plus Wales, Scotland and Northern Ireland. This is the coarsest regional division of the UK.
- **NUTS2** regions correspond to groups of counties in England, groups of districts of Inner London, groups of unitary authorities in Wales, and groups of council areas in Scotland and Northern Ireland. There are 40 NUTS2 regions for the UK.
- **NUTS3** regions correspond to counties, unitary authorities and council areas in England, Wales, Scotland and Northern Ireland. This is the finest regional division of the UK, and there are 174 UK NUTS3 regions.

An alternative definition of regions which is of interest in regional economics is Travel to Work Areas (TTWAs). TTWAs do not correspond to administrative boundaries but capture the *de facto* boundaries of local labour markets on the basis of commuting patterns recorded in census data.¹²

¹² ONS (2016b), *Travel to Work Area Analysis in Great Britain*, September. Retrieved from: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/traveltoworkareaanalysinggreatbritain/2016>

The figure illustrates that there are also large productivity disparities *within* NUTS2 regions. For example, while East Wales sits close to the middle of the productivity distribution among NUTS2 regions, Powys (NUTS3 region in East Wales) is among the least productive places in the UK. Powys is a relatively rural county, whose economy is highly dependent on agriculture, and it has the lowest population density in Wales. To give another example, while the West Midlands is also close to the middle among NUTS2 regions, Solihull (NUTS3 region in the West Midlands) is on par with the high average productivity recorded for Inner London. Solihull is home to Jaguar Land Rover’s main production plant as well as Birmingham Airport with its associated logistics.

Figure 4: Productivity across NUTS2 and NUTS3 regions in the UK in 2017¹³



Source: ONS (2019a)

Figure 4 highlights that most NUTS2 regions are home to successful places, whose productivity compares favourably to the average of the “middle” NUTS2 region. Most

¹³ Productivity is measured as gross value added (GVA) per hour. Note that no NUTS3-level data is available for Northern Ireland.

also have places that underperform relative to their own region and the country. This observation suggests that it is worth looking within regions, as well as across regions, to determine what allows some places to make a success of their local economies.

1.2 Productivity and Other Economic and Social Outcomes

Productivity is an important headline indicator of a region's economic performance because it captures the possible economic rewards from work in a region. Yet there are many other aspects of a region's local economy and culture which determine whether it is a desirable place to work or live. A single indicator cannot capture all these aspects. In practice, however, higher levels of productivity tend to correlate with other desirable economic and social outcomes.

Figure 5 presents an overview of the correlation between productivity and other economic and social outcomes at the level of NUTS1 regions in the UK. The figure combines data from ONS with statistics from the OECD's Regional Well-Being database.¹⁴

The figure documents that productivity is highly correlated with real household disposable incomes at the regional level, as well as the education level of the local workforce. More productive regions also tend to have more widespread broadband access, a higher life expectancy, and a higher employment share in the local workforce. There is some evidence that civic engagement, measured by voter turnout in parliamentary elections, is higher in more productive regions. Moreover, the data suggests that more productive regions are somewhat safer, as they tend to report lower homicide rates.

To be more concrete, Scotland was the third most productive NUTS1 region in the UK in 2016, and Yorkshire and the Humber was the third least productive region. According to the ONS, Scottish labour productivity exceeded Yorkshire's by 15%. According to the OECD data, Scotland and Yorkshire had comparable levels of workforce education, employment participation and life expectancy. However, Scotland enjoyed higher disposable incomes, better broadband access, and saw much higher election participation. Its homicide rate was also less than half the rate reported in Yorkshire.

Figure 5 indicates that productive regions tend to "do well" more generally, but not in every respect. Notably, average self-reported life satisfaction tends to be somewhat lower in more productive regions. Greater London, the most productive NUTS1, also had one of the lowest self-reported life satisfaction scores. The figure provides some

¹⁴ OECD (2018). *Regional Well-Being*, November. Retrieved from: <https://www.oecdregionalwellbeing.org/>

hints why this is the case. There seems to be more housing pressure in productive regions since the average household has fewer rooms per head at their disposal, and residents of more productive regions are less likely to report a strong local network of social ties.

Figure 5: Productivity and other outcomes across UK NUTS1 regions, correlations in 2016¹⁵

	Productivity	Disposable income	Education	Broadband access	Life expectancy	Employment	Voter turnout	Homicide rate	Life satisfaction	Perceived network	Rooms per person
Productivity	1.00										
Disposable income	0.92	1.00									
Education	0.85	0.89	1.00								
Broadband access	0.58	0.72	0.65	1.00							
Life expectancy	0.51	0.72	0.50	0.51	1.00						
Employment	0.40	0.67	0.62	0.67	0.55	1.00					
Voter turnout	0.31	0.52	0.59	0.70	0.18	0.79	1.00				
Homicide rate	-0.16	-0.28	-0.20	-0.10	-0.28	-0.26	-0.23	1.00			
Life satisfaction	-0.27	-0.12	-0.12	0.17	-0.12	0.10	0.40	-0.05	1.00		
Perceived network	-0.50	-0.42	-0.39	0.19	-0.31	-0.21	0.19	0.36	0.70	1.00	
Rooms per person	-0.59	-0.46	-0.37	-0.26	-0.28	0.18	0.07	0.10	-0.30	-0.03	1.00

Sources: ONS (2019a), OECD (2018)

¹⁵ Productivity is the natural logarithm of gross value added (GVA) per hour. Disposable income is the natural logarithm of household real disposable income per person (in purchasing-power-adjusted dollars). Education is the percentage of the labour force with at least upper secondary education. Broadband access is the percentage of households with broadband access. Life expectancy is the natural logarithm of the average expected lifespan at birth. Employment is the employed percentage of the working population. Voter turnout is the percentage of voter turnout at the most recent parliamentary election. Homicide rate is the number of homicides per 100 000 people. Life satisfaction is the average self-reported life satisfaction (0-10 scale) from the Gallup World Poll. Perceived network is the percentage of people who report having friends or relatives “they can rely on in the case of need” from the Gallup World Poll. Rooms per person is the natural logarithm of the average number of rooms per person based on UK national statistics.

Box 3: Productivity and Prices Across Space

In this document, all comparisons of productivity across regions at a given point in time are made in so-called “nominal” terms, which reflect the absolute value of income in pounds generated per hour worked. Ideally, such a comparison should be made in “real” terms, where income per hour is deflated by some measure of local prices. Unfortunately, no detailed data currently exists that makes it possible to compare (and control for) differences in prices across UK regions at a given point in time.¹⁶

There are two different measures of “real” productivity which would be of interest in assessing regional disparities. Each involves a different measure of regional prices. The first deflates nominal productivity by a measure of local *consumer prices*. This measure would tell us how much actual consumption in a given region the average hour worked would afford a resident worker. To see why this is relevant, imagine two regions with the same income per hour, but the first of the two has more expensive shops, restaurants, house prices, and rents. Resident workers in the first region would be worse off than resident workers in the second region.

In a UK context, it is clear that many of the high-productivity regions in Figure 2 are also regions with high local prices and housing costs. For example, housing costs in London are relatively high, while housing costs in Lincolnshire are relatively low, so regional income differences (and, hence, productivity differences) look less stark once we control for these differences in housing costs.¹⁷ Put plainly, resident workers in London benefit less from relatively high productivity in London as a result of London’s relatively high cost of living.

The second measure of “real” productivity would deflate nominal productivity by a measure of the *price of goods and services produced*. To see why this is relevant, imagine two pub owners who generate the same income per hour pulling pints, but the first of the two can sell pints at twice the price. This would imply that the first pub owner is, in fact, only half as productive as the second as she pulls half as many pints per hour. However, she generates the same income per hour simply because her pints are twice as expensive as the pints pulled by owner two. The second measure of “real” productivity thus gives a better sense of differences in regions’ true productive capacities.

¹⁶ For information on price differences across very broad UK regions for the year 2016, see ONS (2016a), *Relative Regional Consumer Price Levels of Goods and Services, UK: 2016*, March. Retrieved from:

<https://www.ons.gov.uk/economy/inflationandpriceindices/articles/relativeregionalconsumerpricelevelsuk/2016>

¹⁷ Clark, S. (2019). *Mapping Gaps: Geographic Inequality in Productivity and Living Standards*, Resolution Foundation, July. Retrieved from:

<https://www.resolutionfoundation.org/app/uploads/2019/07/Mapping-Gaps.pdf>

Research on the comparison of productivity between countries has shown that both these measures of “real” productivity are liable to depart significantly from “nominal” productivity – and from each other.¹⁸ There is every reason to think that the same is true in the comparison of productivity between regions within countries. For this reason, the lack of data for regional price comparison in the UK is a serious constraint in any attempt to interpret the observed regional disparities in incomes per hour.

Given the strong correlation across space between productivity and most other positive economy and social outcomes, it is not surprising that the UK’s large spatial disparities in productivity are mirrored by large spatial disparities in a range of other indicators. Studies by the CBI and KPMG in 2017 reported significant regional differences in the UK with respect to the export-orientation and innovation-intensity of local businesses, the quality of local transport infrastructure, and the skills and motivation of local workforces.¹⁹ Correspondingly, a 2018 survey by EY also documents substantial differences in investment attractiveness.²⁰ Academic research has started to investigate the relationship between productivity disparities and regional differences in self-reported well-being.²¹ One caveat in interpreting UK regional disparities is that there no systematic evidence on how productivity correlates with the cost of living and the price of output (see Box 3).

The remainder of this document will use productivity differences as a “summary” indicator of regional disparities. The focus on productivity is in line with the aim of the Industrial Strategy “to boost productivity by backing businesses to create good jobs and increase the earning power of people throughout the UK.”²² It is also motivated by the recognition that places which improve their productivity standing are also likely to be doing better along a number of other, important dimensions (see Box 2). However, this is not to suggest that productivity should be the only target of policy aimed at rebalancing the UK economy. It also does not mean to imply that

¹⁸ Feenstra, R. C., R. Inklaar, and M. P. Timmer (2015). “The Next Generation of the Penn World Table,” *American Economic Review*, 105, 10, pp. 3150-3182. Retrieved from: <http://dx.doi.org/10.1257/aer.20130954>; and Cuñat, A., and R. Zymek (2018). “International Value-Added Linkages in Development Accounting,” *CESifo Working Paper 7196*, August. Retrieved from: <https://www.cesifo.org/en/publikationen/2018/working-paper/international-value-added-linkages-development-accounting>

¹⁹ CBI (2017). *Unlocking Regional Growth: Understanding the Drivers of Productivity Across the UK’s Regions and Nations*, March. Retrieved from: <https://www.cbi.org.uk/media/1170/cbi-unlocking-regional-growth.pdf>; and KPMG, 2017. *Improving UK Regional Productivity Performance*, November. Retrieved from: <https://home.kpmg/content/dam/kpmg/uk/pdf/2017/11/improving-uk-regional-productivity-performance.pdf>

²⁰ EY (2018). *Bridging the Gap: EY’s UK Attractiveness Survey*, November. Retrieved from: [https://www.ey.com/Publication/vwLUAssets/ey-ukas-towns-report/\\$File/ey-ukas-towns-report.pdf](https://www.ey.com/Publication/vwLUAssets/ey-ukas-towns-report/$File/ey-ukas-towns-report.pdf)

²¹ See McSorley, L. (2018). “Inequality, Well-Being and Inclusive Growth,” *PIN Evidence Review 04*, July. Retrieved from: https://productivityinsightsnetwork.co.uk/app/uploads/2018/07/Evidence-Review_Inequality-Well-being-and-Inclusive-Growth-1.pdf

²² BEIS (2019). *The UK’s Industrial Strategy*, July. Retrieved from: <https://www.gov.uk/government/topical-events/the-uks-industrial-strategy>

productivity improvements should be the only gauge of whether the Industrial Strategy is succeeding in ensuring “prosperous communities across the UK”.²³

Indeed, even the basic evidence presented here supports the notion that regional policy should keep an eye on a broader set of economic and social indicators. For example, policies aimed at reducing housing-market pressures and improving social cohesion are also likely to improve the well-being of local residents. This is the case especially in places in which productivity is already relatively high. For this reason, the Industrial Strategy Council has chosen a broad set of metrics to evaluate the success of the Industrial Strategy at the regional and national level.²⁴

1.3 The History of UK Regional Productivity Disparities

The UK has a long history of regional disparities in income and productivity. In 1901, income per worker was 30% above the UK average in London, and 12% above in the South East.²⁵ It was 14% below the UK average in Yorkshire and 15% below in Wales. According to ONS figures for 2017, income per hour worked is now 33% above the UK average in London, and 8% above in the South East. It is 15% below the UK average in Yorkshire and 16% below in Wales.²⁶ These numbers suggest that regional productivity differences in the UK have been very persistent over the long run. Yet they mask the fact that UK regions experienced some productivity convergence in the mid-20th century, only to diverge again during the 1980s and 1990s.

Figure 6 graphs productivity differences across broad UK regions – roughly corresponding to the NUTS1 level – for the whole period from 1901 until 2017. As can be seen from the figure, regional productivity differences shrank during the first half of the 20th century. They were at their smallest during the 1950s and 1960s. From the 1970s onwards, regional disparities once again started to grow, with London and the South East pulling away. By 2001, disparities had reached a similar extent as in the early 20th century, and they have remained fairly stable since.

The only region which saw a notable improvement in its relative productivity during the 20th and early 21st century was Scotland. In 1901, Scotland was one of the three least productive UK regions, with an income per worker 10% below the UK average. However, by 2017, it was the third *most* productive region, with an income per hour worked almost exactly equal to the UK average. This is not the direct result of oil and gas extraction which picked up on the UK Continental Shelf in the second half of the 20th century. UK regional income statistics do not include income generated offshore (“ex regio”). However, Scotland’s economy has benefited indirectly from these

²³ HM Government (2017), op. cit.

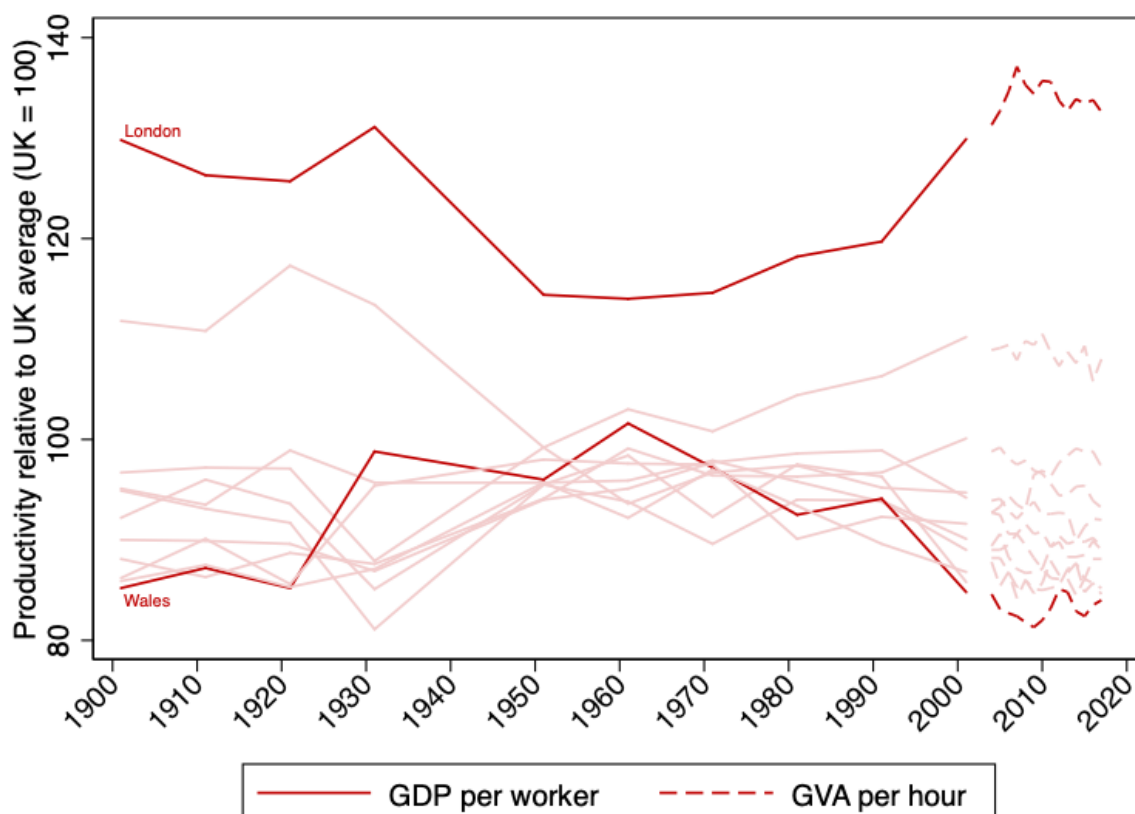
²⁴ See <https://industrialstrategy.org/success-metrics>

²⁵ Geary, F., and T. Stark (2016). “What Happened to Regional Inequality in Britain in the 20th Century?” *Economic History Review*, 69, 1, pp. 215-228. Retrieved from: <https://doi.org/10.1111/ehr.12114>

²⁶ ONS (2019a), op. cit.

activities, through the local supply chains which have built up around them onshore. Scotland’s turnaround thus reflects a geographical “coincidence”, which would be difficult to replicate elsewhere.

Figure 6: UK regional productivity differences between 1901 and 2017²⁷



Sources: Geary and Stark (2016), ONS (2019a)

1.4 Recent Trends

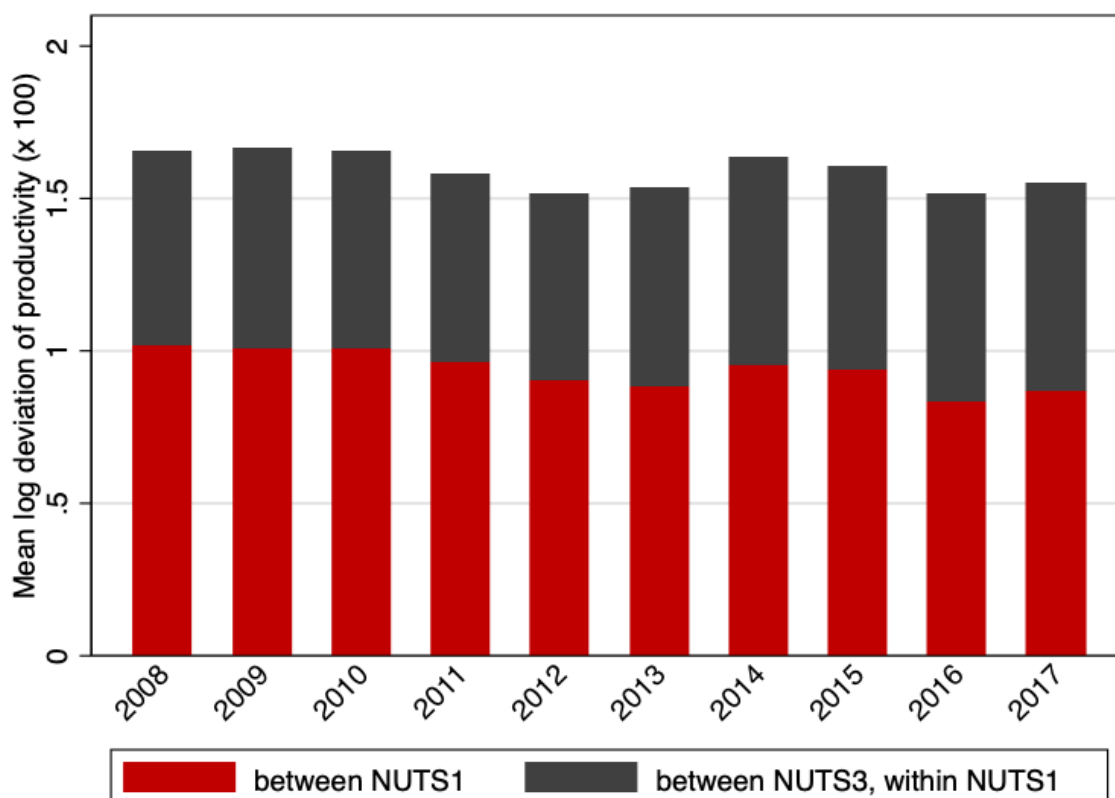
Regional Disparities over the Past Decade

Figure 7 tracks the evolution of UK regional productivity disparities at the NUTS3 level, the narrowest definition of a region, over the decade since the onset of the global financial crisis in 2008. As a measure of inequality, it employs the mean log deviation. This corresponds approximately to the average percentage deviation of a regions’ productivity from the national average. An advantage of this measure of

²⁷ For the 1901-2001 period, productivity is measured as gross domestic product (GDP, in £) per worker. From 2004 onwards, productivity is measured as gross value added (GVA, in £) per hour. All numbers are expressed relative to UK average productivity, which is normalised to 100. Regions included: East Midlands, East of England, London, North East, North West, Scotland, South East, South West, Wales, West Midlands, Yorkshire and the Humber.

inequality is that it allows us to decompose inequality between NUTS3 regions into inequality between (broader) NUTS1 regions, and inequality between NUTS3 regions within NUTS1 regions.²⁸

Figure 7: UK NUTS3 regional productivity differences between 2008 and 2017²⁹



Source: ONS (2019a)

In the figure, the overall size of the bar represents inequality between NUTS3 regions, and the navy portion of the bar represents the contribution of NUTS1 inequality. Using this measure of regional productivity disparities, the figure highlights four facts.

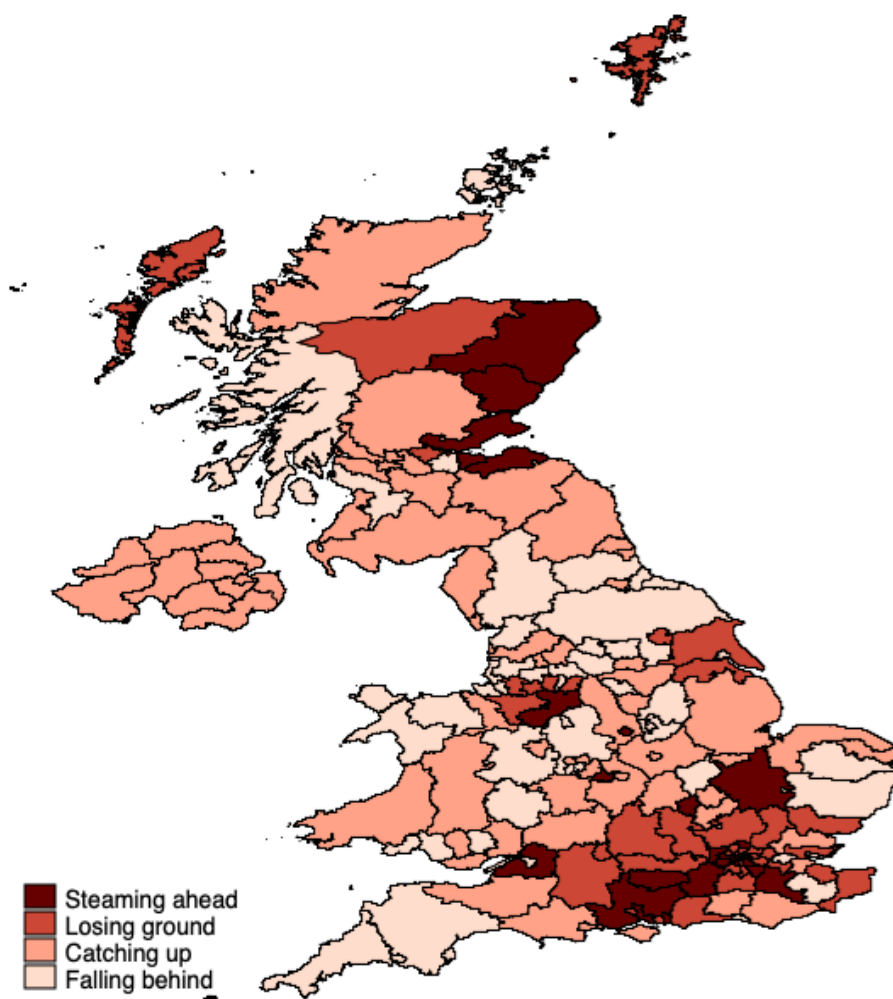
First, there has been a very modest decline in spatial disparities at the NUTS3 level over the past decade. Second, regional productivity differences at the broad NUTS1 level still account for a sizeable chunk of the disparities between more narrowly defined places at the NUTS3 level. In every year since 2008, more than half of the

²⁸ For details see, for example, Haughton, J., and S. R. Khandkar (2009). *Handbook on Poverty and Inequality*. World Bank Training Series, World Bank Publications. Washington, DC; March. Retrieved from: http://siteresources.worldbank.org/INTPA/Resources/4299661259774805724/Poverty_Inequality_Handbook_FrontMatter.pdf

²⁹ Productivity is measured as gross value added (GVA, in £) per hour. The mean log deviation of productivity corresponds to the Theil *L* index.

bar representing NUTS3 inequality is coloured red. Third, over the past decade, inequality between NUTS1 regions has declined noticeably. The red portion of the bars has shrunk. This pattern was already evident in Figure 6. Yet fourth, inequality between NUTS3 regions *within* NUTS1 regions has moderately increased.

Figure 8: A Four-Type Taxonomy of UK regions, 2008-17³⁰



Source: ONS (2019a)

³⁰ “Steaming ahead”: region with above-average initial productivity, and above-average productivity growth; “losing ground”: region with above-average initial productivity, but below-average productivity growth; “catching up”: region with below-average initial productivity, but above-average productivity growth; “falling behind”: region with below-average initial productivity, and below-average productivity growth. Initial productivity is calculated as gross value added (GVA) per hour worked in 2008. Productivity growth is real growth in GVA per hour worked in the 2008-17 period.

To illustrate regional productivity trends over the past decade better, Figure 8 introduces a four-type taxonomy of the UK's NUTS3 regions.³¹ It classifies places according to their productivity levels in 2008, and their productivity growth rates in the 2008-17 period. Regions with an above-average productivity level in 2008, whose productivity grew faster than average in the subsequent decade are described as “steaming ahead”. These regions have increased their productivity advantage over the average during the last 10 years. Regions with an above-average productivity level in 2008 whose productivity grew less than the average are described as “losing ground”. Most of these regions are still doing well compared to the average, but they were even further ahead a decade ago.

Regions with a below-average productivity level in 2008 whose productivity grew faster than average are described as “catching up”. These regions have narrowed their gap with the national average in the recent period. Finally, regions whose productivity was below average in 2008 and whose productivity grew less than average subsequently are described as “falling behind”. These regions were already behind the national average in productivity in 2008, and their gap with the average has increased further since. Together, Figures 7 and 8 capture a number of recent trends which have been noted by researchers and political observers.

To put these regional disparities in context it is useful to consider the potential for reducing regional disparities to contribute to aggregate productivity. As a simple exercise, taking those places classified as “falling behind” in Figure 8 and raising their level of productivity to the UK average would lead to aggregate UK productivity being around 3 per cent higher.

The Resurgence of Cities

Out of 25 places classified as “steaming ahead” in Figure 8, 15 are cities, or parts of cities. Of these, in turn, 8 are part of the London metropolitan area, but they also include cities such as Edinburgh and Derby, and the commuting areas of Aberdeen, Dundee, Bath, Bristol, and Southampton.

The resurgence of cities, in a UK context as well as other developed countries, has been widely noted. In a 2014 survey of urban economics, Max Nathan of Birmingham University, and Paul Cheshire and Henry Overman of the London School of Economics concluded that “after a period of decline, a number of British cities have seen much improved growth rates – both economic and geographic”.³² A 2019 research summary by Ron Martin of Cambridge University and co-authors identified a group of 27 cities which have “pulled ahead” of the national average in

³¹ For a similar taxonomy across OECD countries, see OECD (2016b). *OECD Regional Outlook 2016*, October. Retrieved from: https://www.oecd-ilibrary.org/urban-rural-and-regional-development/oecd-regional-outlook-2016_9789264260245-en

³² Cheshire, P. C., Nathan, M., and H. G. Overman (2014). *Urban Economics and Urban Policy*. Edward Elgar.

terms of productivity growth over the past three decades.³³ This group includes cities such as Cambridge, Reading, Derby, Exeter, and Leamington Spa.

However, the evidence militates against a simple narrative whereby more densely populated urban spaces have been outperforming low-density rural areas. Cheshire, Nathan and Overman emphasise that “this ‘resurgence’ has not been felt in all cities, ... and the data show considerable variation even for cities that are geographically close”. Martin and co-authors also identified a group of 23 British cities whose productivity growth has been underperforming the national average. This group includes cities such as Portsmouth, Coventry, Newcastle, Swansea and Wolverhampton. Meanwhile, the taxonomy in Figure 8 highlights several non-city places which are “steaming ahead” – notably Cheshire, Hampshire (in spite of Portsmouth’s stagnation) and Fife.

The Decline of Coastal Areas

A large majority of the 50 places classified as “falling behind” in Figure 8 cover coastal regions and communities. The economic deprivation and social decline of coastal areas in the UK has received growing attention from government, researchers and the media over the past years. A 2017 evidence review by the Social Market Foundation established that coastal communities were more likely than the rest of the country to suffer from pervasive low pay, high unemployment rates and widespread health problems. In terms of workforce educational attainment, coastal communities were also overrepresented in the bottom tail of local authorities in England and Wales (see Box 4).³⁴

In its recent report, the House of Lords Select Committee on Regenerating Seaside Towns and Communities notes that coastal communities “suffer from a set of issues that have their roots in the decline of their core industries”.³⁵ It lists the long-term structural decline in domestic tourism, fishing, ship building and port activities as specific examples of these core activities. In this respect, coastal areas are no different from other places struggling with structural transformation, such as former steel and mining towns in Wales or the North of England. However, the committee goes on to state that what makes these areas distinct is:

“the combination of industrial decline and geography. Their location on the periphery of the country places them on the periphery of the

³³ Martin, R., Bailey, D., Evenhuis, E., Gardiner, B., Pike, A., Sunley, P., and P. Tyler (2019). *The Economic Performance of Britain’s Cities: Patterns, Processes and Policy Implications*. Cityrevolutions. Retrieved from: <https://www.cityevolutions.org.uk/wp-content/uploads/The-Evolving-Economic-Performance-of-Britain%E2%80%99s-Cities-Patterns-Processes-and-Policy-Implications.pdf>

³⁴ Corfe, S. (2017). *Living on the Edge: Britain’s Coastal Communities*. Social Market Foundation, September. Retrieved from: <http://www.smf.co.uk/wp-content/uploads/2017/09/Living-on-the-edge.pdf>

³⁵ House of Lords Select Committee on Regenerating Seaside Towns and Communities (2019). *Report of Session 2017-19*, April. Retrieved from: <https://publications.parliament.uk/pa/ld201719/ldselect/ldseaside/320/32002.htm>

economy, bringing consequential social problems. This combination of challenges warrants dedicated attention and support.”

The Persistent Sway of Regional “Clubs”

Figure 8 is striking for some of the broad regional patterns it illustrates. Nearly all places which are “steaming ahead” are either in the South East, or in the East of Scotland. Most of the places which are “falling behind” are on the West Coast or in the North of England. This is consistent with the evidence in Figure 7 that patterns of regional disparities between broad NUTS1 regions contribute much of the overall productivity disparities between more narrowly defined NUTS3 regions.

The membership of a place in a broader regional “club” still appears to be an important determinant of its productivity performance and growth potential. A likely explanation is that these broader regional clubs differ in terms of fundamental characteristics – such as workforce attributes, investment attractiveness, local institutions or sectoral specialisation, which influence the productivity dynamics of its constituent places. Section 2.1 will examine the characteristics behind differences in regions’ productivity performance in greater detail.

Box 4: Blackpool – “Left Behind”

Blackpool is a seaside resort on the Lancashire coast. It constitutes one of the 174 NUTS3 regions of the United Kingdom. Based on ONS figures, it was the 7th least productive NUTS3 region in 2008. By 2017, it had moved one further rung down the ladder, becoming the 6th least productive NUTS3 region.

Blackpool emerged as a seaside resort during the Victorian era. Between 1851 and 1901, it grew from a population of 2,500 to 47,000. By 1951, it had 147,000 inhabitants and it continued to be a popular destination for family holidays during much of the 20th century. In recent decades, it has become the victim of what the House of Lords Committee on Regenerating Seaside Towns and Communities calls “the decline of a core industry”. A 2017 article by Sarah O’Conner for the *Financial Times* links Blackpool’s declining fortunes to the rise of budget airlines. The resulting ebb in tourism numbers have left the town “with an oversupply of B&Bs and an undersupply of decent jobs.”³⁶

Blackpool is an example of the multifaceted interrelationships between productivity and other economic and social outcomes. The decline in domestic tourism triggered a reduction in local economic opportunities. The subsequent rise in local un- and underemployment has caused many skilled residents to move away, while

³⁶ O’Connor, S. (2017). “Left Behind: Can Anyone Save the Towns The Economy Forgot?” *Financial Times*, 16 November. Retrieved from: <https://www.ft.com/blackpool>

the fall in rents has attracted more unskilled workers and the unemployed. As the *Financial Times* article puts it “Blackpool exports healthy skilled people and imports the unskilled, the unemployed and the unwell”. This vicious cycle has caused the town to enter a downward spiral. Blackpool now has one of the highest rates of antidepressant prescribing in England, and one of the lowest life expectancies. In turn, this has made it harder to attract new businesses that could offer better-quality local jobs.

This broader regional component of UK spatial disparities comes through in a number of recent analyses – particularly with respect to the diverging fortunes of Britain’s cities. In a 2018 paper in the *Journal of Economic Geography*, Ron Martin and co-authors found that cities in the West Midlands, Yorkshire, the North East, Scotland and Wales led productivity growth during the two decades from 1971 to 1991. Meanwhile, London and the cities in the South East, East of England, South West and the East Midlands led productivity growth between 1991 and 2014.³⁷ A further study by Ron Martin and Ben Gardiner of Cambridge Econometrics documented that cities in the latter set of regions have tended to recover faster from recent recessions.³⁸ Recent research by the Centre for Cities has attributed some of the relative economic success of cities in the Greater South East to the ability of local businesses to build on a regional comparative advantage in service exports.³⁹

Moreover, several studies have noted the special place of Scotland in a UK productivity context. A 2018 report by the Edinburgh-based David Hume Institute showed that Scottish productivity has been bolstered by a skilled work force and relatively favourable terms of international trade, both relative to the UK and other OECD countries.⁴⁰ The same report pointed to an over-abundance of small firms and poor management as a possible drag on Scottish productivity. This gels with other research which has identified the attributes of Scottish firms as a drag on Scotland’s productivity performance relative to the rest of the UK.⁴¹

³⁷ Martin, R., Sunley, P., Gardiner, B., Evenhuis, E., and P. Tyler, (2018). “The City Dimension of the Productivity Puzzle: The Relative Role of Structural Change and Within-Sector Slowdown,” *Journal of Economic Geography*, 18, pp. 539-570. Retrieved from: <https://doi.org/10.1093/jeg/lby008>

³⁸ Martin, R., and B. Gardiner (2019). “The Resilience of Cities to Economic Shocks: A Tale of Four Recessions (and the Challenge of Brexit),” *Papers in Regional Science*, pp. 1-32. Retrieved from: <https://doi.org/10.1111/pirs.12430>

³⁹ Swinney, P. (2018). *The Wrong Tail: Why Britain’s ‘Long Tail’ is not the Cause of Its Productivity Problems*. Centre for Cities, May. Retrieved from: <https://www.centreforcities.org/wp-content/uploads/2018/05/2018-06-05-The-wrong-tail.pdf>

⁴⁰ Kelly, J.-F., Mitchell, M., and R. Zymek (2018). *Wealth of the Nation: Scotland’s Productivity Challenge*, David Hume Institute, September. Retrieved from: <https://www.davidhumeinstitute.com/latest-publications/2019/6/16/wealth-of-the-nation>

⁴¹ Harris, R., and J. Moffat (2017). “The Sources of the Scotland-Rest of the UK Productivity Gap: Implications for Policy,” *Regional Studies*, 51, 9, pp. 1297-1311. Retrieved from: <https://doi.org/10.1080/00343404.2016.1160044>

2 What Are the Causes of Productivity Differences Across Space?

2.1 Why Does Regional Productivity Performance Differ?

The Regional Differences Behind Productivity Disparities

So far, this document has described the spatial disparities in productivity which exist in the UK. In the following section, it will explore the possible reasons behind these spatial disparities. This begins with an exploration of drivers of regional differences in productivity levels. While places may naturally differ in many respects, it is possible to group productivity-relevant characteristics into four categories:

1. **Workforce attributes** - skills, motivation and health of the workforce that a place is able to attract or retain
2. **Capital and infrastructure** - the machinery, equipment and infrastructure which supports work in a given location
3. **Geography and local institutions** - inherent characteristics of a location which may be conducive to economic activity, such its location (coastal or inland, remote or central) or local culture
4. **Sectoral specialisation** - refers to the composition of economic activity which takes place in a given location

Below, this section will provide a brief description of each of these regional characteristics and relate it to the UK evidence.

Workforce Attributes

Among other things, productivity differences are indicative of an hour of work being more “effective” in one place than another. One reason for this might be differences in regions’ workforces. A better trained, more motivated and healthier workforce is likely to generate more output and income per hour of work. Section 1.2 already provided some indication that more productive regions tend to have better educated and healthier residents. ONS figures for 2017 suggest that the UK’s two most productive NUTS1 regions, London and the South East, made up 35% of the UK’s human capital (skill-adjusted measure of the size of the workforce) while only accounting for 26% of the total population.⁴²

⁴² ONS (2018b), *Human Capital Estimates, UK: 2004-17*, October. Retrieved from: <https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/humancapitalestimates/2004to2017>

While there is very probably a two-way relationship between local productivity and a place's workforce skill and health, there is an overwhelming consensus that places that succeed in growing or attracting a more skilled workforce will raise their productivity. If anything, there are indications that skills have become a more important determinant of productivity over time. Research by Peter Sunley of Southampton University and co-authors has identified skills as an important driver of the divergent fortunes of British cities. The cities that experienced the highest population, employment and productivity growth in recent decades were those that had a high share of their employment in high-skill occupations.⁴³ These include cities such as Oxford, Cambridge, Leamington Spa, Reading and Edinburgh. The observation gels with international evidence documenting that the proportion of graduates in the workforce has been a major factor behind the productivity divergence among European regions more generally.⁴⁴

It is important to bear in mind that a region's productive workforce does not need to be "home-grown" as people can choose where to live and work. This is especially true of younger and more skilled workers, who tend to search more widely, and move further, for employment opportunities.⁴⁵ A region may not see productivity benefits from excellent local education if it cannot retain skilled workers. Equally, a region may enjoy high productivity despite poor local education and training opportunities if it can attract skilled workers trained elsewhere. These considerations are especially relevant in a UK context, where London exerts an outsized pull on skilled entrants into the job market. A 2016 report by the Centre for Cities concluded that "while the UK's great universities are spread around the country, many graduates head straight for the bright lights of the capital after completing their studies." The report recorded that 40% of students graduating with at least a 2:1 degree from a Russell Group university worked in London within 6 months of their graduation (see Box 5).⁴⁶

⁴³ Sunley, P., Martin, R., Gardiner, B., and A. Pike (2019). "In Search of the Skilled City: Skills and The Occupational Evolution of British Cities," *Urban Studies*, 1, 25, pp. 1-25. Retrieved from: <https://doi.org/10.1177/0042098019834249>

⁴⁴ Odendahl, C., Springford, J., Johnson, S., and J. Murray (2019). *The Big European Sort? The Diverging Fortunes of Europe's Regions*. Centre for European Reform, May. Retrieved from: https://www.cer.eu/sites/default/files/pbrief_eusort_2030_21.5.2019.pdf

⁴⁵ For example, see Greenwood, M. J (1997). "Internal Migration in Developed Countries." in M. R. Rosenzweig and O. Stark (eds.), *Handbook of Population and Family Economics*, volume 1, chapter 12, pp. 647–720. Elsevier. Retrieved from: [https://doi.org/10.1016/S1574-003X\(97\)80004-9](https://doi.org/10.1016/S1574-003X(97)80004-9)

⁴⁶ Swinney, P., and M. Williams (2016). *The Great British Brain Drain: Where Graduates Move and Why*. Centre for Cities, November. Retrieved from: <https://www.centreforcities.org/wp-content/uploads/2016/11/16-11-18-The-Great-British-Brain-Drain.pdf>

Box 5: Graduate Attraction and Retention in Different British Cities

In a 2016 report, Paul Swinney and Maire Williams studied the movement patterns of UK university graduates. They differentiated between four profiles of graduates: those who went to university in their hometown and remained there for work (“home-grown” graduates); those who went to university elsewhere but returned to their hometown for work (“returners”); those who moved to a new city to study and remained there for work (“retained” graduates); and those who moved to a new city to study and then to a third city to work (graduate “movers”).

Through several case studies, they highlight striking differences between the capacity of different UK cities to attract and retain graduates. **London’s** success is in part based on its performance as a graduate magnet. In 2013-15, 77% of graduates from London-based universities remained in the capital for work after completing their degrees. Moreover, 74% of students who left London for university returned to London after graduation to take up their first graduate job there.

By contrast, **Nottingham’s** two universities are highly successful at attracting students from elsewhere. In the 2013-15 period, 88% of its student population came from elsewhere, but the city struggled to retain graduates. 21% of all graduates of Nottingham’s universities remained for work, and only 16% of those graduates, who had come from elsewhere. During this period, Nottingham was the largest external contributor to London’s graduate population.

Not all British university towns share Nottingham’s fate. For example, **Sheffield** also received 81% of its student population from elsewhere in the 2013-15 period. Yet 31% of its students remained in the city for work after graduation, and only 10% moved to London to take up a job there.

Capital and Infrastructure

Places differ in the abundance and quality of productive assets, which support and complement the activities of the local workforce. This is what economists refer to as their “capital stock”. Productive assets refer to man-made inputs into economic activity in the broadest sense. They may refer to stock of past investments local factories have undertaken to install and maintain state-of-the-art machinery. It may also refer to the stock of investments local businesses have made into “intangibles” such as Research & Development (R&D) to improve the nature and organisation of production. Public infrastructure (for example, the road and rail network) can be viewed as a particular type of capital. This capital represents the portion of a region’s productive assets, which can only be provided effectively through investments by local or national government. There are also types of capital, such as the housing stock and digital infrastructure, which may be provided by either the public or private sector.

Box 6: Foreign R&D Investment in Scotland and the North of England

Foreign direct investment (FDI) refers to investments in productive assets by citizens or companies of one country in another. Economists tend to take a very favourable view of FDI. For the broader economy, FDI may “spawn new sectors, push an economy’s technological frontier, and diversify exports.” For individual companies, FDI may “foster technology transfer, improve managerial and employee skills, and boost investment incentives and productivity.”⁴⁷ According to the collaborative report by EY and the Centre for Towns⁴⁸, there were roughly 10,600 such investments undertaken in the UK between 1997 and 2017.

The report groups these into three types: investments in manufacturing, research and development (R&D) and sales and marketing. This grouping reveals marked differences in FDI disparities across regions. While manufacturing FDI projects are fairly evenly spread around the UK, a small number of regions attract the bulk of R&D FDI. London, the South East and Scotland combined have attracted 50% of all R&D FDI projects.

A comparison between Scotland and the North of England is especially striking. The population of the North of England is roughly double that of Scotland, and the region received 50% more manufacturing FDI projects than Scotland. However, Scotland received nearly *twice* as many R&D FDI projects as the North of England. Evidence suggests that R&D significantly raises firm productivity by increasing product and process quality.⁴⁹ Therefore, a part of the sizable productivity gap between Scotland and the North of England may be attributable to the regions’ differential ability to attract R&D FDI.

To our knowledge, there is no high-quality data available on stocks of capital per worker across UK regions. Some evidence suggests that in the UK (as in many other countries) disparities in capital stocks mirror disparities in productivity across regions. For example, a 2011 paper by UK-based academics for the EU Directorate General Regional Policy presents experimental estimates of capital stocks per worker across NUTS2 regions in the European Union to gauge workforce access to productive assets. According to the study, capital stock per worker in the UK was highest in London, the South East and parts of Scotland, and lowest along the West

⁴⁷ Alfaro, L., and J. Chauvin (2019). “Foreign Direct Investment, Finance and Economic Development,” in M. Spatareanu (ed.) *Encyclopaedia of International Economics and Global Trade, Vol. 1: Foreign Direct Investment and the Multinational Enterprise*, World Scientific, forthcoming. Retrieved from: <https://doi.org/10.1142/11286>

⁴⁸ EY (2018), op. cit.

⁴⁹ Ortega-Argilés, R., Piva, M., and M. Vivarelli (2014). “The Transatlantic Productivity Gap: Is R&D the Main Culprit?” *Canadian Journal of Economics*, 47, 4, pp. 1342-1371. Retrieved from: <https://doi.org/10.1111/caje.12103>

Coast and the North of England.⁵⁰ However, more and better-quality data is needed to draw firm conclusions about the relationship between access to productive assets and productivity across places in the UK context.

While productive assets, unlike people, tend not to be mobile across regions, the pool of investment finance from which these assets are created and maintained is highly mobile across regions and internationally. For this reason, a region's perceived attractiveness as a "place to do business" has a major influence on its ability to encourage private investments in the accumulation of productive assets. A 2018 collaboration between EY and the Centre for Towns revealed large differences in the perceived investment attractiveness across UK regions. Over the last 20 years, the share of foreign-financed investment accounted for by core cities has increased from less than a third (31%) in 1997 to over half (56%) in 2017. Meanwhile, many smaller places have seen zero growth in FDI project numbers over the last two decades (see Box 6).⁵¹ However, looking at investment more generally, a 2017 study of the UK by OECD economists finds that low-productivity regions have tended to have relatively high levels of investment relative to income over the past 15 years.⁵²

Geography and Local Institutions

The inherent geographic and cultural characteristics of a city, town or region may help raise productivity or prove a drag on it. These place characteristics can be thought of very generally as features of the local environment which affect economic activities, but are not a direct input into them. They may include an area's physical location: for example, whether a town is located near the coast, or whether a region is adjacent to a major urban agglomeration. They may include aspects of local culture: for example, whether a region has a tradition of local entrepreneurship, or of a specific management culture. They may also include the quality of local governance such as whether a local council is well run, or whether there is strong local leadership from the business community.

The relationship between geography, incomes and productivity is well established in the literature on (inter)national trade and economic geography.⁵³ However, almost by

⁵⁰ Derbyshire, J., Gardiner, B., and S. Waights (2010). "Estimating the Capital Stock for the NUTS 2 regions of the EU-27," *European Union Directorate Regional Policy Working Paper* 01/2011, September. Retrieved from:

https://ec.europa.eu/regional_policy/sources/docgener/work/2011_01_capital_stock.pdf

⁵¹ EY (2018), op. cit.

⁵² Kierzenkowski, R., Gal, P., and G. Fulop (2017). "Where to get the Best Bang for the Buck in the United Kingdom? Industrial Strategy, Investment and Lagging Regions," *OECD Department of Economics Working Paper No 1426*. Retrieved from: <https://www.oecd-ilibrary.org/docserver/2d01150c-en.pdf?expires=1574200531&id=id&accname=guest&checksum=3896ADA6E36735FBFB11A13043ABD7A5>

⁵³ For example, see Frankel, J. A., and D. Romer (1999). "Does Trade Cause Growth?," *American Economic Review*, 89, 3, pp. 379-399. Retrieved from:

definition, it is difficult to quantify directly the effect of less tangible characteristics of places (e.g. local culture and institutions) on productivity. Very often, these features of a place are said to account for all observed differences in productivity, which cannot be otherwise accounted for. In an international context, these residual differences in productivity are generally found to be large. This signifies a large potential role for culture and institutions in explaining income and productivity differences.⁵⁴

The picture is less clear when considering productivity differences between regions within countries. For example, a 2010 analysis from the Urban and Spatial Programme at the LSE's Centre for Economic Performance investigated the causes of wage differences across 157 regional labour markets in the UK in the decade from 1998 until 2008. Wages are not synonymous with productivity as defined here (see Box 1), but high-wage regions also tend to be high-productivity regions. The study found that controlling for workforce attributes in the analysis explained most wage differences, while place characteristics may have accounted for less than 1% of wage variation across UK regions.⁵⁵

Sectoral Specialisation

Industries and occupations differ in their capacity to generate high-productivity, high-paying jobs. For example, according to ONS statistics for the year 2016, the average hour of work in manufacturing in the UK generated nearly twice as much income as the average hour of work in administrative and support services.⁵⁶ Differences in the mix of industries and occupations across regions can thus give rise to differences in measured region-level productivity. For example, imagine two regions with similar workforce attributes, productive assets per worker and similar geographic and cultural features. If one region were home entirely to manufacturing jobs while the other region were home to administrative jobs, the ONS evidence might lead us to expect the first region's productivity to be double that of the second.

Figure 9 uses ONS data to assess how much differences in regions' industry mix (as opposed to their productivity within given industries) contribute to overall productivity disparities between UK NUTS1 regions. The overall size of each bar indicates the total percentage productivity gap of each region relative to the UK average. For

<https://pubs.aeaweb.org/doi/pdfplus/10.1257/aer.89.3.379>; and Hammer, C., and A. Fichet de Clairfontaine (2016). "Trade Costs and Income in European Regions," *Vienna University of Economics and Business Working Paper* 220. Retrieved from:

https://epub.wu.ac.at/4887/1/HAMMER_FICHET_2016_%28002%29.pdf

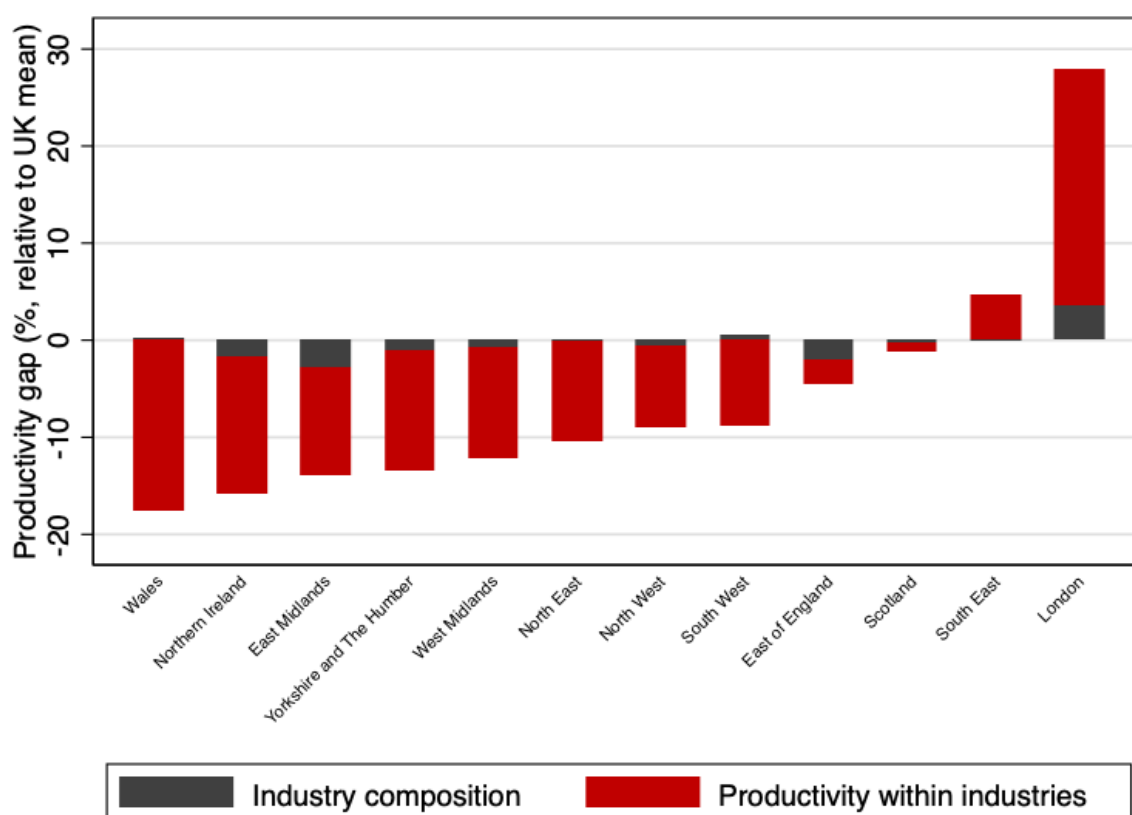
⁵⁴ Gennaioli, N., La Porta, R., Lopez-de-Silanes, F., and A. Shleifer, 2013. "Human Capital and Regional Development," *Quarterly Journal of Economics*, 128, 1, pp. 105-164. Retrieved from: <https://doi.org/10.1093/qje/qjs050>

⁵⁵ Gibbons, S., Overman, H. G., and P. Pelkonen, 2014. "Area Disparities in Britain: Understanding the Contribution of People vs. Place Through Variance Decompositions," *Oxford Bulletin of Economics and Statistics*, 76, 5, pp. 745-763. Retrieved from: <https://doi.org/10.1111/obes.12043>

⁵⁶ ONS (2019b), *Industry by Region Estimates of Labour Productivity*, February. Retrieved from: <https://www.ons.gov.uk/economy/economicoutputandproductivity/productivitymeasures/articles/introducingindustrybyregionlabourmetricsandproductivity/2017>

example, London’s productivity in 2016 was 28% above the UK average, while the productivity in the East Midlands was 14% below. The grey portion of each bar shows what part of each gap can be attributed to differences in regions’ industry mix. For example, it shows that 4 percentage points of London’s productivity advantage can be attributed to industry mix, as can 3 percentage points of the East Midland’s productivity disadvantage. Overall, however, the figure suggests that industry mix only accounts for a small part of productivity disparities at the NUTS1 level. Most of the differences instead seem to arise from regions differing in their productivity within the same industries.

Figure 9: Industry composition and UK NUTS1 regional productivity differences in 2016⁵⁷



Source: ONS (2019b)

The evidence in Figure 9 echoes similar findings elsewhere. A 2018 analysis by the ONS of the non-financial business economy at the NUTS1 and NUTS2 levels reached the conclusion that “with occasional exceptions, a region’s industry structure appears to only play a relatively small role in productivity differences between

⁵⁷ Productivity is measured as gross value added (GVA, in £) per hour. The contribution of industry composition is calculated for each region as the UK average industry productivity in each of 16 broad SIC categories, multiplied by a regions share of hours in this category, and summed over all categories.

regions”.⁵⁸ Similarly, the 2019 research review by Ron Martin and co-authors on the performance of British cities notes that “productivity growth differences across cities are primarily due to differences in within-sector productivity growth”.⁵⁹

However, the conclusion that the composition of economic activity can only account for a small part of the UK regional productivity picture has not gone unchallenged. In recent research, Christina Beatty and Stephen Fothergill of Sheffield Hallam University show that UK productivity disparities shrink more noticeably once we control for regions’ industry mix *as well as* their mix of occupations *within* industries. The authors point out that “within each industry there are also spatial divisions of labour: managers and professionals tend to be located in some places, notably London, whereas the workers undertaking routine production or delivering routine services are more prevalent elsewhere.”⁶⁰

Their work reaches starker conclusions than earlier research investigating the same issue. For example, a 2004 article by Patricia Rice and Anthony Venables for the Centre of Economic Performance found that, while “occupations matter a great deal”, most UK regional productivity differences were due to differences in productivity *within* occupations.⁶¹ Moreover, even if differences across regions in the mix of occupations within industries can explain a large share of regional productivity disparities, it raises the question why some parts of the UK have been so much more successful in attracting high-productivity occupations than others.⁶²

2.2 Three Narratives About Regional Differences

The Root Causes of Regional Differences

Section 2.1 illustrates that we can think of spatial disparities in productivities as the result of differences across space in people, productive assets, place characteristics and production mix. Moreover, Sections 1.2 and 2.1 make the case that these different drivers of productivity tend to be correlated. Places which grow or attract a

⁵⁸ ONS (2018a), *Regional Firm-Level Productivity Analysis for the Non-Financial Business Economy, Great Britain*, April. Retrieved from:

<https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/compendium/economicreview/april2018/regionalfirmlevelproductivityanalysisforthenonfinancialbusinesseconomygreatbritainapril2018>

⁵⁹ Martin, R., Bailey, D., Evenhuis, E., Gardiner, B., Pike, A., Sunley, P. and P. Tyler (2019), op. cit.

⁶⁰ Beatty, C., and S. Forthergill (2019). “Local Productivity: The Real Differences Across UK Cities and Regions,” *Sheffield Hallam University Monograph*, July. Retrieved from:

<https://www4.shu.ac.uk/research/cresr/sites/shu.ac.uk/files/local-productivity.pdf>

⁶¹ Rice, P., and A. J. Venables (2004). “Productivity: Understanding Regional Differences,” *CentrePiece*, Centre for Economic Performance, Autumn. Retrieved from:

<http://cep.lse.ac.uk/pubs/download/CP162.pdf>

⁶² Swinney, P. (2019). “Has the Myth of London’s Productivity Really Been Debunked?,” Centre for Cities Blog, July. Retrieved from: <https://www.centreforcities.org/blog/has-the-myth-of-londons-productivity-really-been-debunked/>

skilled workforce also tend to have a large endowment of productive assets per worker and to be specialised in more productive industries and occupations.

However, these observations do not in themselves *explain* productivity disparities across space. In order to explain why some places succeed as highly productive hubs of economic activity while others do not, it is necessary to understand why some places manage to attract skilled workers, productive investment and the “right” industries and occupations. This requires an examination of the possible root causes of regional differences.

In this section, possible root causes of regional differences are illustrated through three narratives: place fundamentals, agglomeration, and sorting. Each narrative provides a different account of why regions may come to differ in the nature and productivity of their economic activity. While each narrative on its own could in principle account for observed spatial disparities, they are not mutually exclusive. In practice, all three are likely to account for a portion of the regional differences in economic and social outcomes described in Section 1. As a result, there exist different schools of thought in economic geography and urban economics about the relative importance of each of the three.

Crucially, each narrative has somewhat different implications for the role of spatial policy. The following overview is not intended to provide a comprehensive evaluation of the stock of evidence underpinning each narrative. Instead, it will focus on describing them to provide a framework for thinking about regional policy initiatives. The possible use of each of these narratives in judging place-based growth strategies will be taken up explicitly in Section 3.3.

Place Fundamentals

Some fundamental characteristics of local economies can be seen as one root cause of spatial disparities. These are primarily geography, local culture, governance and infrastructure. Under this view, these fundamental characteristics are an important determinant of the economic activities in which different places engage. In turn, the resulting production mix shapes the nature of the local workforce and the type and volume of private investments a place can attract.

To give a simple example, a coastal town has a natural geographic advantage as a port. In turn, the existence of a port creates jobs for a certain type of worker and may attract manufacturing investment. In this example, geography shapes the production mix, people and productive assets, and with them, the productivity of the town. However, non-geographic place characteristics may also matter. A region suffering from a dysfunctional local bureaucracy may not attract productive long-term investments, as investors are deterred by a lack of clarity about local rules and regulations. This would make the region unsuitable for economic activities relying on significant capital investment. A resulting scarcity of high-quality jobs may, in turn,

cause skilled workers to seek their fortunes elsewhere, and hamper local productivity.

Spatial disparities as a result of place characteristics do not necessarily signal a deeper failure of the market economy per se. For example, it may be return-maximising for private investors to channel investments towards the regions close to the centre of economic activity, rather than more remote regions. There may nevertheless be a role for spatial policy in balancing economic activity. This is because private investment decisions do not take into account the social costs of inequality arising from spatial disparities, or from the decline of individual communities.⁶³ Public policy may seek to counteract this through appropriate investments by, for example, improving transport links between peripheral regions and the centre. Moreover, where disparities are the result of institutional differences, policy may seek to bring local bodies “up to speed”.

Agglomeration

In their seminal book “The Spatial Economy”, Masahisa Fujita, Paul Krugman and Anthony Venables define agglomeration as “the clustering of economic activity, created and sustained by some sort of circular logic”. They offer the following example:

“Around the corner from the English National Opera lies St. Martin’s Court, a short street occupied mainly by sellers of secondhand books and prints. It is a reasonable location for such shops, but there are no doubt other locations that would serve as well. Why, then, have the shops’ owners chosen to be there? ... No doubt there is some interesting story about how that cluster of book and print shops originally became established, but what sustains it now is a sort of circular logic: Potential customers come to St. Martin’s Court because they expect to find a range of shops to browse in, and shops locate there because they know they will have access to a large pool of potential customers.”⁶⁴

As illustrated by this example, agglomeration forces may cause economic activity to differ starkly between two places which are fundamentally very similar. If by historical accident one place was able to establish a cluster – of producers and specialised suppliers, say – this place may emerge as highly productive in certain economic activities, and attract specialised labour and investment. The second place, despite a similar geography and institutions, would then look comparatively unproductive. Moreover, starting a new cluster is difficult: place two would struggle to attract

⁶³ OECD (2016a). *The Productivity-Inclusiveness Nexus*, June. Retrieved from: <https://www.oecd.org/global-forum-productivity/library/The-Productivity-Inclusiveness-Nexus-Preliminary.pdf>

⁶⁴ Fujita, M., Krugman, P. R., and A. J. Venables (1999). *The Spatial Economy*. MIT Press.

producers because there are no specialised suppliers locally; and it would struggle to attract suppliers because there are no producers to buy their inputs.

There are two types of “agglomeration economies”: “localisation economies” and “urbanisation economies”. “Localisation economies” are the productivity benefits which result from the co-location, in a particular place, of a number of specialised firms in an industry. The exchange of knowledge, the fostering of a local pool of specialised workers, or the possibility to share infrastructure or supply networks may allow each of these firms to operate more efficiently than they would be able to on their own.

Localisation economies do not require the firms in question to be based in large population centres. This is because an agglomeration of a small number of highly specialised firms on its own may be sufficient to create a self-sustained cluster of economic activity which reaps localisation economies. For example, the NUTS3 region of Inverness & Nairn, Moray and Badenoch & Strathspey has a population density of only 26 inhabitants per square kilometre. However, the region is home to more than half of Scotland’s whisky distilleries and ranks among the 8 most productive NUTS3 regions in Scotland.

By contrast, “urbanisation economies” refer to the productivity benefits firms may experience as a result of locating in large cities. Urbanisation economies are frequently argued to arise because cities act as incubators for new ideas and are characterised by a deep pools of skilled labour.⁶⁵ Access to these local resources allows (certain) firms to operate more productively than they would be able to in a small town or rural area. Unlike localisation economies, urbanisation economies are not primarily the result of firms locating close to other *similar* firms. Instead, they are due to *different* types of firms sharing a common set of resources cities offer. These include infrastructure, a market for specialist workers, and opportunities for knowledge exchange, which in turn stimulate innovation and promote competition. For example, both IT start ups and stock brokers benefit from the ease of hiring, or replacing, a trained mathematician in London’s large graduate labour market.

Until recently, localisation economies were considered a major root cause of regional disparities in spatial economics. However, the growing ease with which firms can trade and interact at a distance has caused this view to shift. In a 2009 presentation to the American Association of Geographers, Paul Krugman acknowledged that the “death of distance” may have diminished the role of localisation economies as an explanation for the distribution of economic activity across space (see Box 7 for an

⁶⁵ For example, see Glaeser (2012). *Triumph of the City*, Pan.

example).⁶⁶ At the same time, the role of urbanisation economies appears to have become more important.⁶⁷

Box 7: The UK Automotive Cluster in Coventry and Warwickshire

Coventry and Warwickshire are often treated as a single region, and they share a Chamber of Commerce. The region is home to one of the UK's long-standing automotive clusters. It contains the headquarters of Jaguar Land Rover (JLR), Aston Martin Lagonda and the London Electric Vehicle Company. It is also the location of the BMW Engine Plant at Hams Hall, and several automotive design and R&D centres. This cluster accounts for 10% of employment in the local economy, as well as 10% of all UK automotive manufacturing jobs. Furthermore, the automotive workforce in Coventry and Warwickshire is 10% more productive than the UK average.⁶⁸

Automotive production in Coventry and Warwickshire experienced a boom during the immediate post-war period. However, in the face of growing European and American competition, the cluster went into decline during the 1970s. By the mid-1980s, only two assembly plants (Browns Lane and Ryton) had survived. The Coventry and Warwickshire cluster staged a turnaround in the early 2000s when the multinational Tata group purchased Jaguar and Rover to create JLR. This investment brought a significant expansion of JLR's R&D and design activities, which has been part of a fundamental transformation of the local automotive sector.

The revival of automotive production in Coventry and Warwickshire was made possible by a combination of global trends and local conditions. Globally, automotive production has seen the rise of international value chains, within which different stages of the production process are carried out in different countries around the world.⁶⁹ This has allowed automotive companies to offshore routine parts of the production process to lower-cost labour markets, while focusing on skill-intensive R&D and design activities in their developed-country plants. The Coventry and Warwickshire automotive cluster now heavily invests in the design of driverless technology and low-emissions vehicles. Locally, JLR has emerged as a

⁶⁶ Krugman, P. (2010). "The New Economic Geography: Now Middle-Aged," *Regional Studies* 45, pp. 1-7. Retrieved from: <https://doi.org/10.1080/00343404.2011.537127>

⁶⁷ For example, see Glaeser, E. L., and J. E. Kohlhase (2005). "Cities, Regions and the Decline of Transport Costs," *Papers in Regional Science*, 83, 1, pp. 197-228. Retrieved from: <https://doi.org/10.1007/s10110-003-0183-x>

⁶⁸ OECD Development (2019). *Local Entrepreneurship Ecosystems and Emerging Industries: Case Study of Coventry and Warwickshire*, March. Retrieved from: https://www.oecd-ilibrary.org/industry-and-services/local-entrepreneurship-ecosystems-and-emerging-industries-case-study-of-coventry-and-warwickshire-united-kingdom_3b6277f9-en

⁶⁹ For example, see Timmer, M. P., Dietzenbacher, E., Los, B., Stehrer, R. and G. J. de Vries (2015). "An Illustrated User Guide to the World Input-Output Database: The Case of Global Automotive Production," *Review of International Economics*, 23, pp. 575-605. Retrieved from: <https://doi.org/10.1111/roie.12178>

key player in the exploitation of entrepreneurial knowledge and investor in technology research. The cluster has also benefited from the proximity of Coventry University and the University of Warwick, whose Warwick Manufacturing Group is a focal point for the interaction between engineering research and industry.

In the UK, the evidence for urbanisation economies is nuanced. A 2015 study by the OECD found little relationship between urban density and productivity for the UK as a whole.⁷⁰ However, a 2017 study by the ONS showed that the productivity of urban areas in the South of England and Scotland systematically outperformed the productivity of rural areas, with no such relationship between density and productivity in the rest of the country.⁷¹ This has caused some to argue that the UK Government should do more to help cities (especially those in the North of England) to reap the benefits of agglomeration.⁷² One way to do so would be to keep down some the costs associated with urbanisation: high rents, congestion and overcrowding of public infrastructure. National and local government can manage these costs through the appropriate design of planning restrictions, and investment in public transportation, schools and hospitals.

Unlike spatial disparities arising from place fundamentals, disparities arising from agglomeration may reflect malfunctions of the market economy. Owing to the circular logic that sustains clusters under agglomeration, it is possible that places which “should” be productive hubs in a particular economic activity fail to take off. This is because the returns to any one firm of investing in a given place depend on who else is expected to be there. Moreover, the satisfaction a young couple receives from moving to a particular place depends on who else already lives there. As Giles Duranton and Anthony Venables put it in a 2018 paper for the World Bank, this “creates a first-mover problem: no one wants to move to a new place while uncertain about its future development”.⁷³ The agglomeration narrative thus leaves room for industrial policy to play a potentially powerful role in solving coordinating problems between private-sector actors, and influencing the distribution of economic activity across space. At the same time, agglomeration theories provide little practical

⁷⁰ OECD (2015). *The Metropolitan Century: Understanding Urbanisation and Its Consequences*, February. Retrieved from: https://read.oecd-ilibrary.org/urban-rural-and-regional-development/the-metropolitan-century_9789264228733-en#page1

⁷¹ ONS (2017a), *Exploring labour productivity in rural and urban areas in Great Britain: 2014*, April. Retrieved from: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/articles/explorinlabourproductivityinruralandurbanareasingreatbritain/2014>

⁷² For example, see T. Forth (2018). “Making the Case for Agglomeration,” Tom Forth Blog. Retrieved from: <https://www.tomforth.co.uk/agglomeration/>

⁷³ Duranton, G., and A. J. Venables (2018). “Place-Based Policies for Development,” *Policy Research Working Paper WPS 8410*, World Bank Group, April. Retrieved from: <http://documents.worldbank.org/curated/en/547051523985957209/pdf/WPS8410.pdf>

guidance on how this role should be performed. This shortcoming has drawn criticism from some academics.⁷⁴

Sorting

The recognition that people choose where to live and work is central to the third narrative. Moreover, the third narrative emphasises that there is a strong tendency for people to choose to live and work alongside others who are like them. This tendency for individuals to self-sort across space is referred to as “sorting”. Sorting used to be considered an explanation only for patterns of segregation and differences in neighbourhood outcomes within cities (see Box 8). However, there is an increasing recognition that sorting may also explain spatial disparities within broader regions.

It is easy to see why similar workers may (unconsciously) sort into the same areas. For example, a city that already boasts a large population of recent graduates may find it easier to attract more recent graduates because such a city is likely to offer an attractive lifestyle. As another example, a place with a high share of low-income residents is more likely to have relatively low rents and house prices, increasing its attractiveness to other low-income households looking for a new place of residence.

Furthermore, as these examples highlight, sorting is self-reinforcing. As more recent graduates move into a city, it becomes even more attractive to future cohorts of graduates. As more low-income households move into an area, the local housing market will increasingly reflect the needs and budgets of low-income households. In this way, under the sorting narrative, small initial differences between places may give rise to large disparities of resident people across places. These then shape the industry mix, investment attractiveness and productivity of places.

The self-reinforcing nature of sorting illustrates that, just as with agglomeration, the location choices of workers may be underpinned by a “circular logic”. However, unlike agglomeration, sorting *on its own* would not provide a strong justification for spatial policy. According to a pure sorting narrative, differences in the productivity of places result primarily from differences in the productivity of individual workers. Absent other factors, policy could tackle these by improving individuals’ access to education and training – a people rather than a place-based policy.

Yet, in practice, sorting across space *interacts* with pre-existing inequalities and agglomeration in such a way as to amplify both. Regarding the former, there is strong evidence that individuals differ in their mobility across places, and that these differences are closely related to income and education. For example, a book by Pauline Leonard of Southampton University and Rachel Wilde of University College London shows that young people from working class backgrounds demonstrate

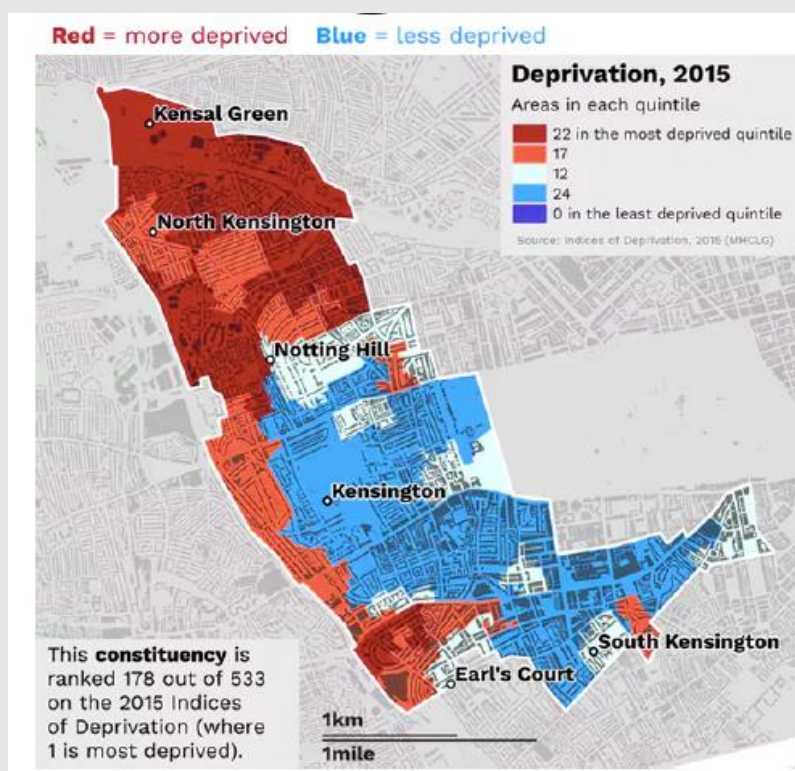
⁷⁴ Martin, R. (2015). “Re-balancing the Spatial Economy: The Challenge for Regional Theory,” *Territory, Politics, Governance*, 3, 3, pp. 235-272. Retrieved from: <https://doi.org/10.1080/21622671.2015.1064825>

stronger local place attachment to home than those from middle-class backgrounds, while also lacking resources to travel further afield.⁷⁵

Box 8: Spatial Sorting within Kensington Constituency

For a project investigating urban poverty, Alasdair Rae and Elvis Nyanzu of Sheffield University mapped government statistics on deprivation for individual constituencies in England. The figure below reproduces their map for the London constituency of Kensington.⁷⁶

Figure 10: Deprivation in Kensington constituency



Source: A. Rae and E. Nyanzu (2019).

Kensington forms part of one of the highest-productivity, highest-income NUTS3 regions in the UK. Yet, as the figure shows, it is home to neighbourhoods which belong in the most deprived quintile (20%) of areas in the country. What is more, these neighbourhoods form almost a single stretch in the North and West of Kensington.

The coexistence of very deprived and very affluent neighbourhoods in an urban space, as well as the clear line of demarcation between them, is an example of sorting. Small pre-existing differences between neighbourhoods are exacerbated as more affluent households move to a more affluent street, while falling rents

⁷⁵ Leonard, P., and R. J. Wilde (2019). *Getting In and Getting On in the Youth Labour Market; Governing Young People's Employability in Regional Context*, Bristol University Press, forthcoming.

⁷⁶ Rae, A., and E. Nyanzu (2019). *These Maps Show How Hard It Is to Measure Inequality in English Council Areas*. CityMetric Blog, March. Retrieved from: <https://www.citymetric.com/politics/these-maps-show-how-hard-it-measure-inequality-english-council-areas-4529>

attract poorer households into vacant properties. The result are large spatial disparities within cities. In a 1969 article, Economics Nobel Laureate Thomas Schelling first formally identified sorting as a powerful mechanism to explain spatial segregation within cities.⁷⁷

The moving and sorting of (high-earning) individuals who are very regionally mobile – through the effects on local amenities, housing and other place characteristics – in turn has a collateral effect on less mobile (low-income) households. Spatial policy may be justified to ensure that sorting patterns do not increase pre-existing differences in incomes and opportunities.

Regarding the interaction between sorting and agglomeration, it is likely that they reinforce each other. As argued above, firms may reap productivity benefits from locating in large cities (so called “urbanisation economies”), because it gives them access to a large pool of highly skilled labour. In turn, high productivity in cities may lead to high city wages for skilled workers, making cities more attractive to people who belong to this group. The sorting channels that operate through amenities and local housing cost then reinforce this loop. In this way, the existence of sorting compounds the policy rationale for managing agglomeration. Furthermore, it casts a spotlight on the need for policy to be mindful of differences in place amenities such as schools, leisure offers, housing stock, or the environment, which encourage sorting patterns.

In a UK context, research by Stephen Gibbons and Henry Overman of LSE, and Panu Pelkonen of Sussex University has found that sorting has the potential to explain a large share of UK regional disparities in wages. The authors employ a large micro data set of individual workers across the UK. They find that regional wage disparities, just like productivity disparities, are large and persistent. However, using detailed information on individual workers, they show that most of this can be explained because people of similar characteristics (such as high or low skill) sort into the same labour markets.⁷⁸ A 2014 study by Sabine D’Costa of Westminster Business School and Henry Overman also found that sorting is a significant factor behind relatively high urban wages in the UK.⁷⁹ However, as argued by Philip McCann of Sheffield University in a 2016 book, sorting (especially the sorting of university graduates) appears to operate mostly *within* broader regions in the UK.⁸⁰ It

⁷⁷ Schelling, T. C. (1969). “Models of Segregation,” *American Economic Review*, 59, 2, pp.488-493. Retrieved from: <https://doi.org/10.1080/0022250X.1971.9989794>

⁷⁸ Gibbons, S., Overman, H. G., and P. Pelkonen (2014), op. cit.

⁷⁹ D’Costa, S., and H. G. Overman (2014). “The Urban Wage Growth Premium: Sorting or Learning?,” *Regional Science and Urban Economics*, 48, pp. 168-179. Retrieved from: <https://doi.org/10.1016/j.regsciurbeco.2014.06.006>

⁸⁰ McCann, P. (2016). *The UK Regional-National Economic Problem: Geography, Globalisation and Governance*, Routledge, London.

is thus unlikely to explain a large part of the productivity disparities between broad (NUTS1) regions.

3 Evaluating What Works in Boosting Regional Productivity

3.1 The UK Regional Policy Context

Over the last two decades, successive governments have sought to raise UK productivity and address regional disparities. Yet the emphasis on, and policy approach towards, regional differences has shifted over time.

Between 1997 and 2010, the three consecutive Labour governments explicitly prioritised tackling regional inequality in *productivity*. The first of these (1997-2001) established three devolved administrations⁸¹ and 9 Regional Development Agencies (RDAs) for England. The purpose was to develop regional and local institutions with the capability to identify and address regionally and locally specific issues. The RDAs had responsibility for developing 10-15-year regional economic strategies with local partners. Over time, they were granted increasing levels of responsibility.⁸²

The first budget by the Coalition government in 2010 scrapped RDAs and replaced them with Local Enterprise Partnerships (LEPs). LEPs are smaller than RDAs geographically as there are 38 LEPs in the place of 9 RDAs. They were also more flexibly organised, less focused on productivity improvement, and received less dedicated funding. Some previous RDA programmes were abolished, while others were returned into more central management by the Department for Business, Innovation and Skills. Unlike RDAs, most LEP funding did not come from dedicated funds, but LEPs were expected to bid for funding from newly set up funds.⁸³

In 2017, the Conservative government published the Industrial Strategy White Paper.⁸⁴ The Local Industrial Strategy policy in the White Paper is delivered by Mayoral Combined Authorities or LEPs. It represents a more explicit recognition of the need for strategic government intervention in the economy, especially with a view to fostering economic activity in all regions of the UK. It also recognises that local places have the knowledge of their strengths and opportunities, and the ability to engage local stakeholders and businesses in the development of local economic plans. It re-introduces an emphasis on raising productivity. Mayoral Combined Authorities and LEPs are working with government to develop Local Industrial Strategies which will help them set out how they can maximise the use of future

⁸¹ The Scottish Parliament, the National Assembly for Wales, and the Northern Ireland Assembly

⁸² Cook, J., Hardy, D., and I. Sprackling (2019). "Productivity Policy Review," *PIN Policy Review* 11, January. Retrieved from: <https://productivityinsightsnetwork.co.uk/app/uploads/2019/01/Productivity-Policy-Review.pdf>

⁸³ Bentley, G., Bailey, D., and J. Shutt, 2010. "From RDAs to LEPs: A New Localism? Case Examples of West Midlands and Yorkshire," *Local Economy*, pp. 535-557. Retrieved from: <https://doi.org/10.1080/02690942.2010.532356>

⁸⁴ HM Government (2017), op. cit.

funding streams (though the strategies themselves should not contain proposals that require new funding). Meanwhile, regional policy in Scotland, Wales and Northern Ireland remains at the discretion of the devolved administrations. The devolved administrations are tied into the Industrial Strategy through some centrally provided funding opportunities (such as the Industrial Strategy Challenge Fund, Growth Deals and the future Shared Prosperity Fund) and through a commitment to “learn from each other in areas of common interest”.⁸⁵

As even the brief preceding overview makes clear, the institutions and targets of UK regional policy have been in constant flux since at least the late 1990s. The first report by the UK 2070 Commission includes strong words:

“For nearly a century, attempts have been made to address the UK’s regional problem. Few have delivered their full potential. However, few have had any real continuity. These stretch from 1920s Committee on Unhealthy Areas, through 1960s regional policy, to the Regional Development Agencies (RDAs), to the localism agenda of the 2010s.”⁸⁶

This assessment echoes findings by a 2017 Institute for Government report, which summarised that policy churn highlighted persistent weaknesses of the UK system of government, including “poor institutional memory” and “a tendency to abolish and recreate organisations”.⁸⁷

In addition to policy churn, many observers have criticised that the UK’s economic management remains fairly centralised. For example, a recent working paper by Diane Coyle of Cambridge University and Marianne Sensier of Manchester University criticises that major funding decisions on infrastructure investment are almost wholly centralised. Moreover, their analysis of Treasury appraisal guidelines suggests that appraisal rules skew infrastructure spending towards richer, more productive regions.⁸⁸ The 2019 Heseltine Report begins with a call to give greater autonomy to England’s cities, stating that “much of England... remains constrained by Whitehall’s dead hand of centralism”.⁸⁹

⁸⁵ HM Government (2017), op. cit.

⁸⁶ UK2070 Commission (2019). *Fairer and Stronger: Rebalancing the UK Economy. The First Report of the UK2070 Commission*, May. Retrieved from: <http://uk2070.org.uk/wp-content/uploads/2019/05/FIRST-REPORT-UK-2070-EXECUTIVE-SUMMARY.pdf>

⁸⁷ Institute for Government (2017). *All Change: Why Britain is so Prone to Policy Reinvention and What Can Be Done About It*, March. Retrieved from: https://www.instituteforgovernment.org.uk/sites/default/files/publications/IfG_All_change_report_FINAL.pdf

⁸⁸ Coyle, D., and M. Sensier (2018). “The Imperial Treasury: Appraisal Methodology and Regional Economic Performance in the UK,” *Regional Studies*, forthcoming. Retrieved from: <https://doi.org/10.1080/00343404.2019.1606419>

⁸⁹ Heseltine, M. (2019). *Empowering English Cities: A Special Report*, July. Retrieved from: <https://englishcitiesmichaelheseltine.premediastudio.com/MichaelHeseltine/>

While this may indicate a scope for further devolution of decision making, Paul Cheshire, Max Nathan and Henry Overman point out that devolution is not without its pitfalls. Devolution may worsen economic outcomes if decision powers are devolved to the wrong level and it may even increase spatial disparities if there are differences in the quality of local government, and some regions are better able to take advantage of devolution than others. Their survey of the evidence on the benefits of devolution shows that these benefits appear to be strongly context-dependent.⁹⁰

A recent report by Abigail Taylor of City-REDI on the funding environment of LEPs provides evidence which resonates with some of these pitfalls of decentralised governance. It shows that small rural LEPs have struggled to galvanise funding. Meanwhile London and Manchester have been especially successful.⁹¹ In its 2019 Progress Review of LEPs, the House of Commons Committee on Public Accounts further criticises that “LEP boards are not yet representative of their local areas and business communities and that local scrutiny and accountability arrangements are not strong enough considering the significant sums of public funding that LEPs manage”.⁹²

3.2 Evaluating Local Growth Strategies under the Industrial Strategy

A Gauge of Regional Success for the Industrial Strategy

As discussed in Section 1, the UK’s regional disparities are large and long-standing. It is unrealistic that any industrial strategy would be able to reduce them to zero, or indeed reduce them appreciably in anything less than a ten year timeframe. The Government’s Industrial Strategy acknowledges the magnitude of regional disparities in the UK and seeks to reduce them, aiming to create “prosperous communities throughout the UK”.⁹³ Given this, how should one assess the success of the Industrial Strategy from a regional perspective? And how difficult would it be to achieve success?

To shed some light on these questions, Figure 11 returns to the taxonomy of UK NUTS3 regions introduced in Figure 8. It gives an overview of all NUTS3 regions whose productivity in 2008 was at least 10% below the average, and whose annual real productivity growth rate between 2008 and 2017 was at least 0.1 percentage

⁹⁰ Cheshire, P. C., Nathan, M., and H. G. Overman (2014), op. cit.

⁹¹ Taylor, A., 2019. *The Realities, Challenges and Strengths of the External Funding Environment at LEP Level*. Smart Specialisation Hub, March. Retrieved from: <https://www.birmingham.ac.uk/Documents/college-social-sciences/business/research/city-redi/Projects-Docs/EXTERNAL-FUNDING-ENVIRONMENT-FINAL-REPORT-c.pdf>

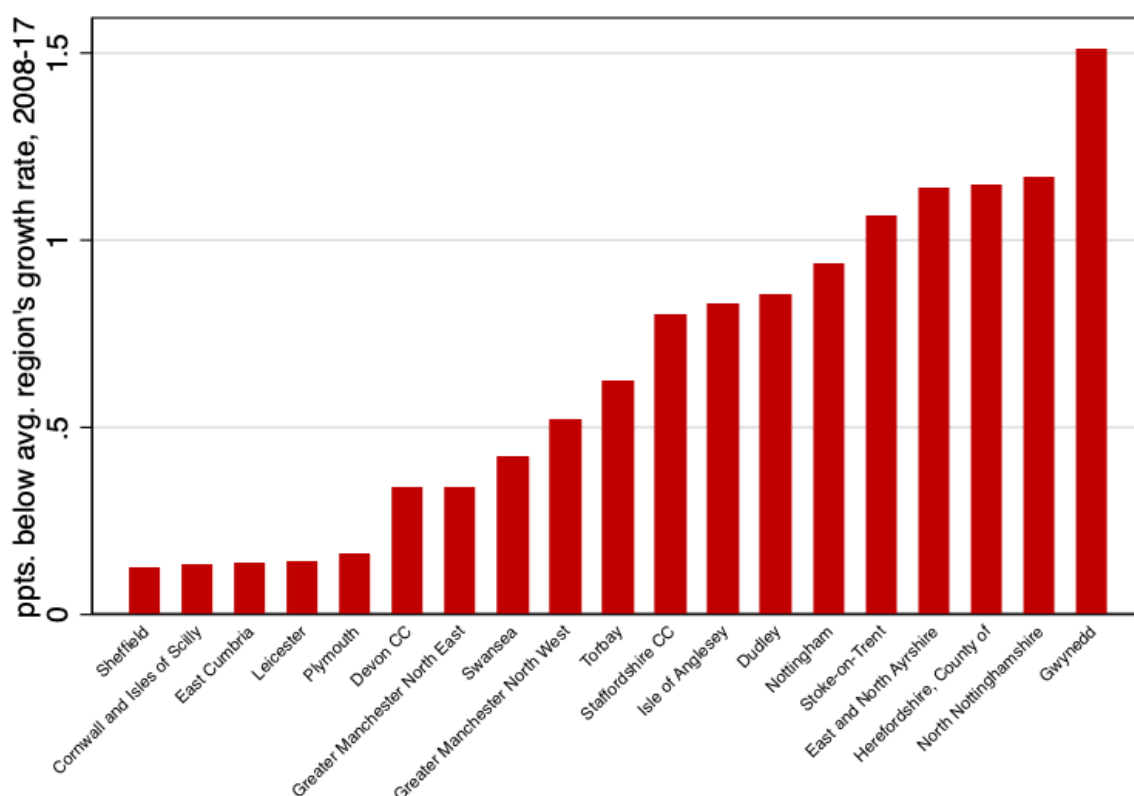
⁹² House of Commons Committee on Public Accounts, 2019. *Local Enterprise Partnerships: Progress Review*, One Hundred and Fifth Report of Session 2017-19, June. Retrieved from: <https://publications.parliament.uk/pa/cm201719/cmselect/cmpubacc/1754/1754.pdf>

⁹³ HM Government (2017), op. cit.

point below the average region’s annual growth. By definition, all of these regions would have been included in the “falling behind” category in Figure 8.

To be more concrete, average productivity across all NUTS3 regions in 2008 was £28 per hour. The average annual growth rate of productivity across all regions was 0.23% in the 2008-17 period. Sheffield’s productivity in 2008 was £24 per hour (more than 10% smaller than £28). Sheffield’s annual real productivity growth rate between 2008 and 2017 was 0.10% (more than 0.1 percentage points below 0.23%). For this reason, Sheffield is defined as “falling behind” and is included in the chart.

Figure 11: NUTS3 regions which are falling behind, 2008-17⁹⁴



Source: ONS (2019a)

It can be seen from Figure 11 that 19 out of the UK’s 174 NUTS3 regions matched this description. The figure also shows the difference (in percentage points) between each region’s annual growth rate and the average regional annual growth in the 2008-2017 period. Since all of the 19 regions grew *less* than the average, a larger bar indicates that a region’s growth was *weaker* compared to the national average. At one end of the spectrum, Sheffield’s productivity grew 0.13 percentage points less

⁹⁴ All regions had initial productivity at least 10% below the average region’s level, and a subsequent real productivity growth rate at least 0.5 percentage points below the average region’s growth. Initial productivity is calculated as gross value added (GVA, in £) per hour worked in 2008. Productivity growth is real growth in GVA per hour worked in the 2008-17 period.

annually than the average region's in the 2008-17 period. At the other end, Gwynedd in Wales grew a staggering 1.50 percentage points less, experiencing a significant real productivity *decline* over the past decade.

Box 9: Ten Principles for a Successful Local Growth Strategy

According to the What Works Centre for Local Economic Growth⁹⁵, a successful local growth strategy will have the following characteristics:

1. It considers the state of the local economy:

The strategy uses appropriate data and comparison, acknowledging that the appropriate policy mix will vary across places.

2. It considers how the economy is evolving:

The strategy uses scenario planning and resists political pressures to support existing employment over new initiatives.

3. It distinguishes between supply- and demand-side reasons for underperformance:

The strategy carefully evaluates whether encouraging new economic activities requires the removal of supply-side obstacles (e.g. financial constraints) or demand-side obstacles (e.g. weak business plans).

4. It targets its policy response:

The strategy identifies market failures, and the best levers to address them, considering costs and benefits of the intervention.

5. It considers its impact on competition:

The strategy carefully weighs any impact on competition from proposed interventions to alter market outcomes.

6. It will allow for experimentation:

The strategy experiments to find more cost-effective ways to promote growth, and clearly defines criteria for success and for monitoring their fulfilment.

7. It uses independent expert advice:

The strategy relies on expert panels and peer review mechanisms.

8. It exploits ways to share risks:

The strategy aims to share risks by co-funding interventions with the private sector and involves them in decision making.

9. It embeds evaluation:

The strategy has appropriately designed evaluation mechanisms and sunset clauses.

10. It successfully coordinates across different stakeholders:

The strategy champions accountability and transparency in keeping stakeholders on board.

⁹⁵ What Works Centre for Local Economic Growth (2018). *Developing Effective Local Industrial Strategies*, June. Retrieved from: https://whatworksgrowth.org/public/files/18-06-21_Designing_Effective_Local_Industrial_Strategies.pdf

One way to gauge the ultimate success of the Government's Industrial Strategy in promoting productivity across the whole UK might be to review in what ways the strategy will have benefited places such as those highlighted in Figure 11. Since all 19 regions in the figure have productivity significantly below the national average, it is likely that many of them are not realising their full potential. Moreover, their relatively low productivity growth rates over the past decade have meant that these regions have fallen further behind in recent years. Arresting, or even reversing, spatial disparities in the UK thus requires unlocking the potential for productivity growth in places like the ones in Figure 11.

This gauge of regional success for the Industrial Strategy is insightful for three reasons. First, it illustrates that the places which may require particular policy attention are largely drawn from a small set of broader regions: Wales, Cornwall, the West and the North of England. Second, it makes it clear that the Industrial Strategy must succeed in boosting productivity growth both in some cities which have been falling behind (such as Sheffield, Leicester and Nottingham) as well as more rural areas (such as Cumbria and Herefordshire).

Third and finally, the figure provides a sense of the scale of the challenge. Assuming that the average NUTS3 region's annual productivity growth remains at 0.23% over the coming decade, a region would need to grow at this rate merely to keep up with the average and maintain its productivity standing relative to the rest of the country. For most of the places in Figure 11, this would require raising their annual productivity growth by more than half a percentage point relative to the past decade. Such dramatic turnarounds in regions' productivity performances are rare.

Evaluating Local Growth Strategies

MCAs and LEPs have begun publishing Local Industrial Strategies. The West Midlands Local Industrial Strategy was published in May 2019.⁹⁶ The Greater Manchester Local Industrial Strategy was published in June and five further Local Industrial Strategies were published in July 2019.⁹⁷ With the arrival of the first Local Industrial Strategies, there is a question of whether the local growth strategies outlined in these publications are "fit for purpose" in boosting regional productivity.

⁹⁶ HM Government (2019a). *West Midlands Local Industrial Strategy*, May. Retrieved from: <https://www.gov.uk/government/publications/west-midlands-local-industrial-strategy>

⁹⁷ HM Government (2019b). *Buckinghamshire Local Industrial Strategy*, July; HM Government (2019c). *Cambridgeshire and Peterborough Local Industrial Strategy*, July; HM Government (2019d). *Oxfordshire Local Industrial Strategy*, July; HM Government (2019e). *South East Midlands Local Industrial Strategy*, July. All retrieved from: <https://www.gov.uk/government/publications/oxford-cambridge-arc-local-industrial-strategies> ; HM Government (2019f). *West of England Local Industrial Strategy*, July. Retrieved from: <https://www.gov.uk/government/publications/west-of-england-local-industrial-strategy>

A 2018 report by the What Works Centre for Local Economic Growth proposes 10 principles for successful local growth strategies (see Box 9).⁹⁸ These principles aim to provide guidelines to LEPs for the drafting of Local Industrial Strategies. They emphasise the importance of tailoring the strategy to local economic conditions, relying on expert advice and assessments, and embedding risk assessments and evaluation. The extent to which a local growth strategy adheres to the What Works principles could serve as one part of the evaluation of Local Industrial Strategies.

Beyond this, the evidence reviewed in the present document highlights some additional angles from which to interrogate such strategies. Below, they are presented in the form of five further questions about the contents of published strategy documents:

1. Does the strategy clearly articulate a particular local problem, or set of problems, it seeks to address?

This overlaps with, and adds to, the principles proposed by the What Works Centre. It requires the strategy to have taken stock of local circumstances and local trends. However, it also emphasises the need for the strategy to be transparent about local economic problems which require strategic intervention through industrial policy. This is especially important for regions towards the bottom end of the UK's regional productivity distribution. For example, the strategy document may identify issues such as poor transport links with other regions, a lack of local entrepreneurship culture, the failure of a promising local sector to thrive, or the region's lack of skilled workers.

There will be a strong temptation to couch local growth strategies in the language of opportunities, not shortcomings and bottlenecks. It is justifiable (and even desirable) for a strategy to want to "build on existing strengths". But it is not enough for a region to be very productive in certain economic activities already to merit further investment in expanding them. Rather, in order to justify intervention, a local growth strategy needs to demonstrate that the productivity or employment potential of these existing activities is limited compared to their potential by place characteristics, the local workforce, or a likely market failure.

2. Which of the three narratives outlined in Section 2 could explain the problem, or set of problems, identified in the strategy?

If local growth strategies clearly identify local economic shortcomings that require policy intervention, it becomes possible to place their thinking into the framework of the three narratives about regional productivity differences which were described in Section 2. For example, a strategy that identifies poor

⁹⁸ What Works Centre for Local Economic Growth (2018). *Developing Effective Local Industrial Strategies*, June. Retrieved from: https://whatworksgrowth.org/public/files/18-06-21_Designing_Effective_Local_Industrial_Strategies.pdf

transport links as a major challenge is consistent with the first narrative, whereby “place fundamentals” (e.g. geography, infrastructure and institutions) are key determinants of local economic performance. The same goes for a strategy seeking to address an issue of lack of local entrepreneurship. A strategy that showcases a promising emerging cluster of economic activity which has underperformed would fit the “agglomeration” narrative. Finally, a strategy that emphasises the skill mix of the local workforce as a potential bottleneck should be evaluated with the “sorting” narrative in mind.

Section 3.3 uses examples from already published Local Industrial Strategies to demonstrate how regional obstacles to productivity growth can be assessed against the three narratives. As the examples show, there is often more than one narrative which can account for a particular local issue. Such ambiguity is not a problem. It serves to illustrate that there may be several ways to diagnose the deep roots of local challenges, and different policy approaches which are consistent with addressing them.

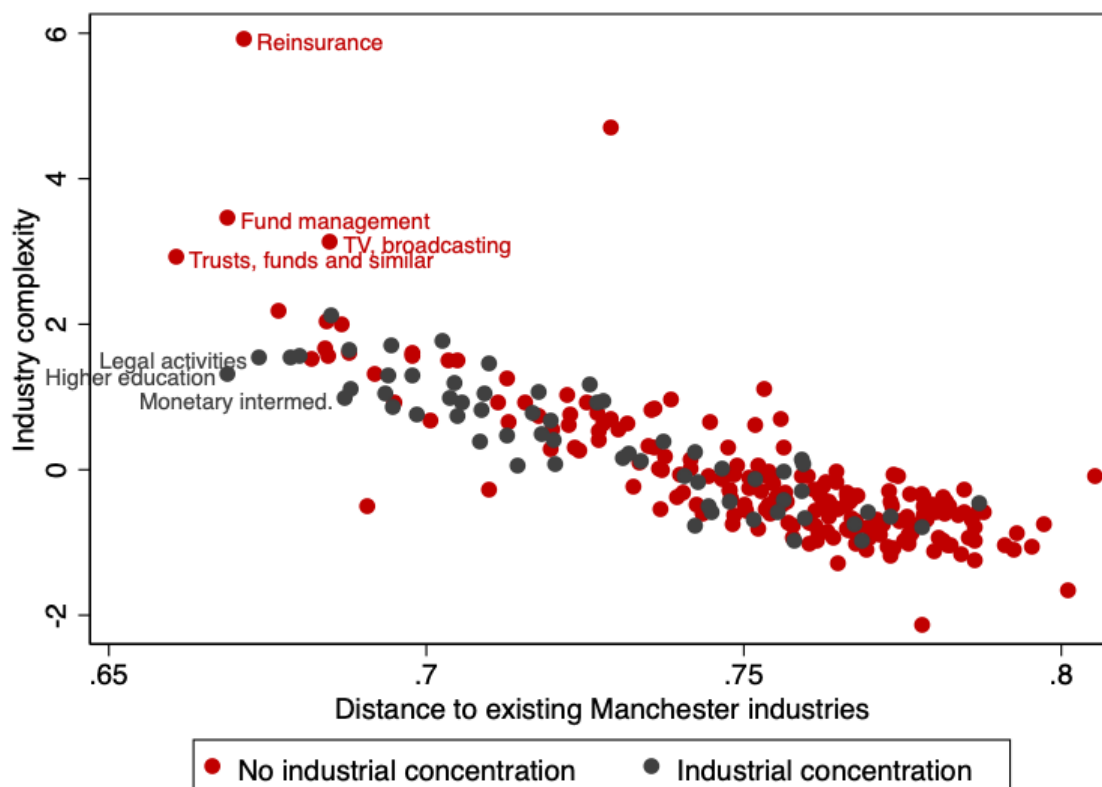
Box 10: Economic Complexity Analysis

Economic complexity analysis is a new approach towards identifying promising industrial opportunities for a region from empirical data. It is based on two indices. One is an index of the “complexity” of an economic activity: what is the level of local economic capabilities required to produce a particular good or service? The other is an index of “distance” of a particular activity from a region’s existing production mix: how close is the nature of economic activities already being undertaken in a region to a new activity the region *could* engage in?

The economic complexity of industries is of interest because countries or regions engaging in more complex activities have been shown to have higher incomes and productivity growth.⁹⁹ Therefore, it seems desirable for places to gear their industrial strategies towards encouraging more “complex” economic activities. At the same time, it is implausible that a region should be able to grow any “complex” activity it chooses. Encouraging such an activity is more likely to succeed if it is also “close” to the region’s existing production mix.

Figure 12: Economic Complexity Analysis for Manchester (see next page)

⁹⁹ Hausmann, R., Hidalgo, C. A., Bustos, S., Coscia, M., Simoes, A., and M. A. Yildirim (2014). *The Atlas of Economic Complexity: Mapping Paths to Prosperity*, MIT Press.



Source: P. Mealy and D. Coyle (2019)

Using economic complexity analysis, Penny Mealy and Diane Coyle of the Bennett Institute identified possible strategic opportunities for the city of Manchester. In Figure 12, these are represented by the labelled red dots. Activities such as reinsurance or fund management are both economically “complex”, and similar to industries with an existing foothold in Manchester (e.g. legal activities or monetary intermediation).

However, the application of economic complexity analysis to regional economies is still in its infancy. Recent research suggests that it may need to be interpreted with care, and adapted further, when evaluating development opportunities in a regional context.¹⁰⁰

3. Given the underlying narrative(s), are the proposed remedies and evaluation criteria appropriate?

Thinking about the narrative, or set of narratives, which can account for a specific regional economic problem makes it easier to assess what

¹⁰⁰ Cicerone, G., McCann, P., and V. A. Venhorst (2019). “Promoting Regional Growth and Innovation: Relatedness, Revealed Comparative Advantage and the Product Space,” *Journal of Economic Geography*, forthcoming. Retrieved from: <https://doi.org/10.1093/jeg/lbz001>

interventions might be appropriate. It also provides a better sense of the scope for success. For example, for judging proposed policy interventions motivated by “place fundamentals”, it would seem natural to compare the local economy with other places. If the proposed intervention is the improvement of transport infrastructure, what can be learned from the experience of better connected, higher-productivity regions? If a lack of local entrepreneurship is identified as a bottleneck, what can be learned from places that are viewed as a good entrepreneurial benchmark?

If the “sorting” narrative is relevant to a proposed intervention, the mobility patterns of workers, in addition to “place” characteristics, become an important consideration. For example, if a local growth strategy proposes training initiatives to fill skills gaps in the workforce, does it also consider how to retain these workers locally once trained? Does the local initiative replicate similar initiatives elsewhere? If so, might it be better to attract workers with the right skills from elsewhere, rather than to ‘home grow’ these skills?

The appropriate evidence base for the “agglomeration” narrative is the trickiest to determine. This is precisely because circular reasoning is at the heart of the narrative: “if only our region *could* start a cluster in activity X, this cluster *would* be very successful”. At the same time, “agglomeration” thinking is likely to motivate a sizable portion of initiatives proposed in local growth strategies. The track record of policy planners in spotting opportunities for new regional clusters, and encouraging them through targeted investments, is generally seen as poor. In a 2017 research article, Andrés Rodríguez-Pose of the London School of Economics describes this track record with respect to low-income, low-productivity regions as follows:

“A combination of misguided investments – frequently pursuing individual interests at the expense of collective ones ... –, income-support transfers, and public employment has often resulted in protected, assisted, and sheltered economies, increasingly incapable of mobilising their true economic potential”.¹⁰¹

However, new analytical approaches may make it feasible to provide more objective and compelling evidence of opportunities for strategic investment and expansion at the local level. One of these approaches is “economic complexity analysis” (see Box 10).¹⁰² Economic complexity analysis identifies local economic opportunities by spotting high-value economic activities which

¹⁰¹ Rodríguez-Pose, A., 2017. “The Revenge of the Places That Don’t Matter (and What to Do About it),” *Cambridge Journal of Regions, Economics and Society*, 11, 1, pp. 189-209. Retrieved from: <https://doi.org/10.1080/00343404.2019.1654603>

¹⁰² Mealy, P., and D. Coyle, 2019. *Economic Complexity Analysis. Greater Manchester Independent Prosperity Review*, March. Retrieved from: https://www.greatermanchester-ca.gov.uk/media/1913/gmipr_tr_economiccomplexityanalysis.pdf

require similar capabilities as those already in place in a region, but which are currently not a (major) part of a region's portfolio of productive activities.

4. Are the goals of the strategy realistic? Are they sufficiently ambitious?

As noted in Sections 1 and 3.2, the UK's regional productivity disparities are sizeable. It is therefore unrealistic for any local growth strategy to aim to improve a place's relative productivity standing dramatically within a short space of time. At the same time, the examples in Figure 11 showcased that even moderate success requires growth strategies to be ambitious. Strategy documents should aim to make the case that the proposed interventions are likely to result in meaningful and sustained increases in local productivity growth rates. Where possible, this case ought to be bolstered by interregional, international or historical comparisons.

5. What mechanisms are in place to ensure that the intervention(s) proposed by the strategy will be seen through to completion?

Finally, Section 3.1 identified a lack of longevity in regional policy as an issue that has set back previous attempts to reduce UK regional productivity disparities. It would be ideal for local growth strategies to recognise the risk of changes in the local and national policy environment. Where possible, their design should reflect these risks. This could be achieved by favouring initiatives which, once started, become self-sustaining over time. It could also be achieved through public-private collaborations which guarantee funding continuity even in the face of changes in the national policy environment.

3.3 Interpreting Local Challenges Using the Narratives: Three Examples

This section provides some more concrete examples of how the three narratives from Section 2 can be deployed to think about local challenges addressed in actual strategy documents. To do so, it draws on quotes from the six Local Industrial Strategies, which had been published by the end of July 2019. Below, the source text is deliberately reproduced in a manner that omits any reference to the relevant region or original document.

The quotes are "anonymised" because it is not the intent of this section to engage in a formal evaluation of (or parts of) published Local Industrial Strategies. Instead, it aims to showcase the uses of the narratives from Section 2 in reading descriptions of local growth strategies more generally. Any references to specific places and documents would distract from the broader insights the examples below were selected to convey.

Example 1: Networked Clusters

“The opportunities presented by the increased networking of business clusters [in the region] are potentially huge. ... However, this high projected growth is contingent on [the region] being able to attract very considerable amounts of inward investment through advancement of existing specialist clusters.”

On the face of it, Example 1 appears to a poster child for the “agglomeration” narrative. The quote explicitly refers to the “advancement of existing specialist clusters”. This indicates a regional strength in highly specialised business activities of the kind that are likely to be subject to the “circular”, self-sustaining economic logic referred to by Masahisa Fujita, Paul Krugman and Anthony Venables. The quote further suggests the need for a “big-push” investment in order to advance the cluster towards sustaining itself at a higher level of activity. In line with this, the strategy document proposes to work with government to attract the right firms and investments into the area.

However, the local issue captured in Example 1 could also be assessed through the lenses of the “place fundamentals” and “sorting” narratives. Taking at face value the assessment that the regional cluster operates below potential, one possibility is that place characteristics (such as infrastructure or local culture) are holding economic activity back. Another possibility is that the cluster’s growth is limited by difficulties in retaining an appropriately skilled local workforce. If these barriers were removed, increased investment attractiveness would unlock private inward investment without the need for further promotion by local or national government.

The strategy document, in fact, explicitly recognises these possibilities. It goes on to state that the cluster’s “growth potential would – in the absence of sizeable interventions to improve local [transport] infrastructure and skills – be hindered by other constraints”. This opens the door to other possible interventions that may promote the “increased networking of business clusters”, such as publicly funded upgrades of local transport networks and initiatives to train or attract skilled workers.

As discussed above, the scope for improvements under the “agglomeration” narrative is difficult to determine. One way to do so might be to identify specific ancillary activities to the region’s existing cluster that are currently not performed locally. The recognition that the “place fundamentals” and “sorting” narratives may be at play in Example 1 makes it possible to set further tangible benchmarks for success. For example, if a poor transport infrastructure is holding local economic activity back, what can be learned from regions whose investments in local mobility have successfully linked up existing business to foster new activities? If local firms are constrained by a lack of skilled workers, what is being proposed to make the region a more attractive place to work for individuals with the appropriate qualifications?

Example 2: Missing Middle in Skills

“On basic skills, some 11 per cent of [the region’s] residents had no qualifications in 2018 compared to eight per cent nationally, and parts of [the region] have the highest proportion of the working age population with no qualifications or NVQ1 in the country. There is a ‘missing middle’ of technical skills at levels two and three. Less than a third of [the region’s] residents are qualified to NVQ Level 4+.”

Like Example 1, the local challenge identified in Example 2 – a skills gap in the local population – can be interpreted from the vantage point of different narratives. The Local Industrial Strategy from which the example is drawn emphasises “place fundamentals”. It goes on to say that “much of this relates to connectivity” and goes on to describe, in a subsequent section, that:

“only 41 per cent of residents can access three or more strategic centres by public transport within 45 minutes at peak times, making physical access to jobs and skills an issue for too many people”.

The force of the argument is that improved local infrastructure would lower the cost of accessing training for residents and raise the incentives for skill improvements by making better jobs more accessible across the region. As with Example 1, an appeal to the “place fundamentals” narrative invites comparison with other places. Is there evidence that regions with better internal transport infrastructure do not suffer from a “missing middle” problem? Are there regions which have improved their skills outcomes by improving local transportation?

Example 2 could also be viewed in the context of the “sorting” narrative. The latter emphasises that more skilled workers also tend to be more mobile, and that these individuals are more likely to choose actively where to live and work. The “sorting” narrative thus raises the question whether the region from example 2 is doing enough to attract and retain skilled workers. For example, what amenities does the region already offer, and in which areas might there be room for improvement?

Some of the remedies under the “sorting” narrative might overlap with interventions justified by “place fundamentals”: a region with better local transport may also be able to more easily attract and retain high-skill, high-productivity workers. However, the “sorting” narrative places an additional emphasis on place characteristics, which enhance the “consumption value”, rather than the productive capacity, of a region. Examples of factors that enhance this value include the quality of the residential housing stock, local cultural life, and local schools. Improvements in local life quality – measured directly, or indirectly through the location choices of workers – thus emerge as an additional measure of success.

Example 3: Uneven Access to Finance

“The picture on availability of, and access to, finance and intellectual property is mixed. [One sub-region] has a deep pool of early stage finance ..., but elsewhere [in the overall region] there is a lack both of seed finance and an absence of the collaborative approach to innovation which seems to be so important a part of [the first sub-region’s] success.”

The uneven access to finance within a region described in example 3 could be interpreted with the “place fundamentals” and “agglomeration” narratives in mind. The source Local Industrial Strategy document opts for the former. It attributes the lack of access to finance as a “market failure” that has been solved better in the successful sub-region than in the rest of the overall region. According to the document, these differences in institutions can account for the differential access of firms to outside financing and the resulting productivity gap within the region. It proposes the creation of a new investment fund “to fill gaps in the equity and loan market”.

As is clear from the strategy document, the successful sub-region is also a cluster of economic activity with “agglomeration benefits around high-value industries”. The “agglomeration” narrative would put this observation centre-stage. As the sub-region has achieved a self-sustaining cluster of high-value activities, it enjoys easier access to finance and higher levels of innovation than the rest of the overall region. Under the “agglomeration” narrative improved access to finance in other parts of the region is unlikely to yield the same benefits, unless these parts succeed in attracting and retaining specialised high-value economic activities. This interpretation would yield a radically different policy implication. Rather than credit access, the rest of the region may require strategic investments or business incentives to kick-start new business activities, or up-scale existing ones. If successful, such interventions would give rise to activities which suit existing local capabilities and succeed in attracting outside financing on their own.

All three examples convey the benefits of thinking through, and allowing for, different root causes that may give rise to specific local challenges. Doing so shows that there is generally not a single appropriate policy response to a given local issue. A carefully designed local growth strategy will acknowledge this and, to the extent that it relies on a particular policy remedy, use evidence in support of the narrative which underpins the specific intervention.

4 Summary and Conclusions

It is widely acknowledged that the UK's regional disparities in productivity are large – in an absolute sense, and relative to other countries – and that they have a long history. This evidence review has taken stock of what we know about the nature and causes of differences in productivity across UK regions. It has done so with a view to drawing lessons for the implementation of local growth policies under the Government's Industrial Strategy. Four challenges for the Industrial Strategy emerge from the review of the evidence:

- 1. The set of places “underperforming their potential” is diverse, highlighting the need for growth strategies to be carefully tailored to local conditions.**

The Industrial Strategy aims to reduce regional productivity disparities and endeavours to create “prosperous communities throughout the UK.” In keeping with the Industrial Strategy's focus on productivity, this review identifies places whose productivity levels and growth rates fall significantly short of the UK average as areas which are likely underperforming relative to their “full potential”. The evidence suggests that, aside from productivity, these places tend to perform poorly along a range of other socio-economic indicators.

Under this definition, the set of places that fall short of their potential is very diverse. It includes some cities that have been falling behind as well as more rural areas, geographically remote areas as well as places close to high-productivity centres of UK economic activity. This diversity calls for local growth strategies that are carefully tailored to local conditions.

- 2. The set of “underperforming” places is drawn from a small set of broader regions, which requires regional policy to find a suitable balance between targeted local interventions and policies aimed at addressing the common needs of larger regions.**

Most of the low-productivity, low-growth places identified in this review are located in a few broader regions – Wales, Cornwall, the West and the North of England. While these regions also contain many places that perform significantly better, this shows that the failure of a place to realise its “full potential” is likely to be the result of a combination of specific local conditions and structural challenges of the broader region.

As a result, the Industrial Strategy needs to balance two objectives. It must help unlock the potential of broader (roughly NUTS1) regions that have struggled to keep pace with overall UK productivity growth since the 1970s. In

addition, the strategy needs to offer assistance to the worst performing (roughly NUTS3) places within those broader regions. At present, the Industrial Strategy provides little guidance to LEPs and devolved administrations how this balance ought to be struck. For example, the Government's policy prospectus for the design of Local Industrial Strategies says little on how local growth strategies should weigh boosting productivity at the regional level and tackling productivity disparities within the region.¹⁰³

3. There are different possible root causes of the productivity (under)performance of places. Policy interventions need to be designed in response to a clear diagnosis of local needs, and evaluated against relevant measures of success.

This review highlights that i) differences in fundamental place characteristics – such as geography or local culture, ii) differences in the “luck” places have enjoyed in attracting self-sustaining clusters of economic activity, and iii) differences in the ability of places to attract and retain skilled workers are possible root causes of productivity disparities across UK regions. All three are likely to account for a portion of the regional variation in economic and social outcomes described in this review. However, some may be more relevant to certain places than others.

Ideally, local policy interventions should be designed to tackle whichever is identified as the most significant root cause of a place's lagging productivity. Since it is rarely possible to make this determination with certainty, and since some of the root causes may even interact, local growth strategies need to be developed so as to be “narrative-proof”. The proposed interventions should be sufficiently broad as to be able to succeed even if the diagnosed cause of a region's economic (under)performance turns out to differ from the actual one. The evaluation of these strategies needs to be carried out in a manner that acknowledges that the face of success may differ depending on what is perceived to be the root cause of a region's productivity challenge.

4. There is the potential for regional spill-overs from local growth strategies, which complicate the evaluation of success and may require policy coordination across regions.

Private investment, which finances part of the stock of capital underpinning a region's productivity, is highly mobile – both nationally and internationally. Moreover, workers are also mobile across a country's regions. This is especially true for younger and more skilled workers. For this reason, a local growth strategy designed to attract a particular type of investment or worker

¹⁰³ HM Government (2018). *Local Industrial Strategies: Policy Prospectus*, October. Retrieved from: <https://www.gov.uk/government/publications/local-industrial-strategies-policy-prospectus>

may succeed at the expense of other regions competing for the same. Conversely, a region aiming to “home grow” investment finance or workforce skills may see the benefits of local initiatives leak to other regions.

For these reasons, there is some need for local growth strategies to be complemented by national-level coordination and initiatives. At present, there is little clarity about the national and regional-level objectives of the Industrial Strategy, how these should be balanced, and how they might interact.

Box 11: Evidence Gaps

Regional consumer and producer prices

There is no systematic evidence on how the measures of productivity presented throughout this evidence review correlate with the cost of living and the price of output across UK regions (see Box 3). This limits our understanding of how much consumption an hour worked in a given region would afford a resident worker. It also means that some of the regional disparities described here may be due to differences in the prices of goods and services produced, not to differences in the true productive capacities of places.

Constructing consumer and producer price indices to make more meaningful comparisons across space possible would require the collection of extensive information on regional prices. This is a complex and costly task. As a result, some existing studies have focused only on a subset of key prices, such as housing costs.¹⁰⁴ Meanwhile, analyses relying on more comprehensive price data have tended to offer only one-off snapshots.¹⁰⁵ However, there may be alternatives to the construction of fully-fledged price indices.

One such alternative is the “short-cut method”. It is a statistical approach to estimating price differences across places from readily available economic and geographic information. The short-cut method has a considerable pedigree in the international comparison of prices and living standards¹⁰⁶. Future studies may be able to extend it to the UK regional context.

Relationship between productivity and well-being

Section 1.2 notes that there is a negative correlation at the NUTS1 level between productivity and one measure of well-being – the average self-assessment of life satisfaction calculated by the OECD on the basis of Gallup survey data. This

¹⁰⁴ For example, see S. Clark (2019), op. cit.

¹⁰⁵ For example, see ONS (2016b), op. cit.

¹⁰⁶ For example, see Kravis, I. B., Heston, A. W., and R. Summers, 1978. “Real GDP per Capita for More Than One Hundred Countries,” *Economic Journal*, 88, 350, pp. 215-242. Retrieved from: <https://doi.org/10.2307/2232127>

negative correlation is also found when looking at the ONS Annual Population Survey.¹⁰⁷

However, these findings for UK NUTS1 regions using specific wellbeing measures are at odds with other evidence. International survey data compiled by the World Bank suggests that the citizens of richer, more productive countries tend to be happier than the citizens of poorer, less productive economies.¹⁰⁸ UK evidence from individual-level data has also shown that, after controlling for individual characteristics, residents of economically more successful places report higher levels of well-being.¹⁰⁹ These seemingly contradictory findings call for more research into the relationship between productivity and well-being at different geographic levels, and using different sets of well-being indicators.

Regional capital stocks

As discussed in Section 2.1, differences in the local abundance and quality of productive assets (“capital”) and infrastructure give rise to differences in productivity across places. No consistently produced estimates of capital stocks currently exist for UK regions. This makes it impossible to assess quantitatively the contribution of capital and infrastructure to UK regional productivity disparities. Yet such an assessment would be very informative, especially in light of the widespread perception that some regions – most notably London and the South East – enjoy higher incomes and productivity because they receive a higher share of investments.

Where regional time-series data on investment (“gross fixed capital formation”) is available, estimates of regional capital stocks can be derived using this data.¹¹⁰ The ONS has published short regional investment time series upon request.¹¹¹ As a step towards the consistent estimation of UK regional capital stocks, it would be desirable for such data to be published and updated at regular intervals. This

¹⁰⁷ Haldane, A., 2019. *Is All Economics Local?*, SPERI Annual Lecture, University of Sheffield, 7 May 2019. Retrieved from:

<https://www.bankofengland.co.uk/-/media/boe/files/speech/2019/is-all-economics-local-speech-by-andy-haldane.pdf?la=en&hash=577BDED2260063C517798A13E4C53E17CF82CC26>

¹⁰⁸ See World Bank (2019). *World Happiness Report 2019*, March. Retrieved from:

<https://worldhappiness.report/ed/2019/#read>

¹⁰⁹ What Works Wellbeing, 2019. *Individual and Local Area Factors Associated with Self-reported Wellbeing, Perceived Social Cohesion and Sense of Attachment to One’s Community: Analysis of the Understanding Society Survey*, September 2019. Retrieved from:

<https://whatworkswellbeing.org/product/individual-and-local-area-factors-associated-with-self-reported-wellbeing-perceived-social-cohesion-and-sense-of-a-achment-to-ones-community-analysis-of-the-understanding-society-survey/>

¹¹⁰ For an example using Scottish data, see M. Mitchell and R. Zymek (2018) “Scotland’s ‘Middling’ Productivity – An International Perspective,” Fraser of Allander Institute Blog, December. Retrieved from:

<https://fraserofallander.org/scottish-economy/productivity/scotlands-middling-productivity-an-international-perspective/>

¹¹¹ Office for National Statistics (2017b). *Regional Gross Fixed Capital Formation: NUTS1 and NUTS2, 2000 to 2016*, December. Retrieved from:

<https://www.ons.gov.uk/economy/regionalaccounts/grossdisposablehouseholdincome/adhocs/007897/regionalgrossfixedcapitalformationnuts1andnuts22000to2016>

would provide researchers and analysts with a common basis to compute and compare capital-stock estimates.

In the face of these challenges, the Industrial Strategy will be successful from a place perspective if it meets the following conditions:

- **It introduces a new degree of continuity into UK regional policy**

Over the past decades, UK regional policy has been in constant flux. A tendency to abolish and re-create regional-policy institutions has impaired the build-up of meaningful institutional memory, and hampered attempts to make a dent into UK regional disparities through public intervention.

- **It fosters the development of local growth strategies that are robust and realistic**

As noted above, the difficulty in diagnosing the root causes of a region's productivity performance require growth strategies to be robust to different interpretations of the evidence. Moreover, they need to be realistic. Dramatic turnarounds in a region's productivity are rare. At the same time, even moderate success requires growth strategies to be ambitious. The Industrial Strategy needs to ensure that there is a case (based on interregional, international or historical comparisons) that proposed local interventions are likely to result in meaningful and sustained increases in local productivity growth rates. This will require action across a range of policy areas, to ensure a holistic approach to the various factors at play. For example, we know that a better trained, more motivated and healthier workforce is likely to generate more output and income per hour of work.

- **It keeps the spotlight on places that are “underperforming their potential”**

There will be a natural tendency for local growth strategies to “build on existing strengths” of a region. However, it is not enough for a region to be very productive in certain economic activities already to merit further investment in expanding them. Moreover, such investments would likely benefit places that are already doing well by a region's standards. The Industrial Strategy must counterbalance this tendency by keeping a focus on places that seem furthest from realising their productivity potential. This will not only contribute to balancing productivity growth across the UK, but also help ensure that interventions are directed towards places where they have the best chance of achieving meaningful turnarounds.

This review has also highlighted three substantial evidence gaps that limit our understanding of regional differences in the UK (see Box 11). The first concerns the lack of data for the comparison of consumer and output prices across regions at

given points in time. Such data would make it possible to obtain more meaningful measures of “real” (price-level-adjusted) differences in regions’ productivity. The second concerns the relationship between productivity and non-economic indicators of well-being at a relatively fine spatial grid. As the review has showed, this relationship is potentially complex and under-researched. The third concerns high-quality data of the stock of productive assets (“capital”) per worker at NUTS1 level and below. More detailed information on local productive assets and infrastructure would make it possible to assess the role of under-investment as potential source of productivity disparities.

This review has evaluated the existing publicly available evidence, mainly statistical data at an aggregate level. The data tells us little about policy process and development, which are also important for boosting regional productivity. LEAs and Mayoral Combined Authorities have been handed the new task of developing Local Industrial Strategies. As yet, we have little knowledge of how this process is being carried out. To evaluate local growth strategies in the UK more fully, the Industrial Strategy Council is undertaking qualitative research interviews to get a better understanding of the local perspective on, and experience of, developing this new feature of UK regional policy.

The Industrial Strategy Council supports the creation, use and dissemination of data that fills these gaps. Doing so would contribute to a better understanding of the nature of UK regional differences, and of the policies required to foster greater prosperity and welfare everywhere.