

# What levelling up really means

Changing the geography of knowledge in Britain

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# 00

## Executive Summary

Cities matter to the national economy because they provide benefits to businesses and workers that they can only access in urban areas. In the UK, the most successful urban economies are those that have been able to provide the competitive advantages that highly knowledge-based firms require. These include large numbers of skilled workers with the ability to create and share lots of knowledge face-to-face.

Economic complexity is an analytical approach that attempts to measure how developed an economy is, based on the amount of accumulated knowledge a place has. Economic complexity has been widely used to compare countries, but to date has been less commonly applied at the subnational level, especially in the UK. Using this approach for cities and large towns for the first time with historical data, this briefing shows:

- **Present and past economic complexity of British cities and large towns is highly associated with current productivity levels.** Successful cities and large towns today – mostly located in the Greater South East – had higher levels of complexity in 1981.
- **The largest cities outside the Greater South East are much more complex today than they were in 1981.** For example, Manchester was the 52<sup>nd</sup> most complex local economy in Britain in 1981 – today it is 18<sup>th</sup>. Likewise, Glasgow was the 38<sup>th</sup> most complex city, and today it is 7<sup>th</sup>.
- **However, despite their greater complexity, the large cities outside the Greater South East still underperform in terms of productivity.** Although they are more productive than their smaller neighbours, they are still less productive than smaller cities in the Greater South East. In addition, and despite these recent gains, the largest British cities still lag their French and German counterparts.

This matters not just for their local economies, but the national economy too, as the continued underperformance of Britain's large cities creates a cost to the national economy that is estimated to be at least £48 billion per year. Closing this gap is essential if the Government is to meet its ambition of having an internationally competitive city in every region.

The key messages for policymakers from this analysis are:

- **Levelling up the economy must focus on the geography of knowledge.** For levelling up to truly occur, the geography of knowledge in Britain must change. Over the past four decades this has already begun to shift, as the renaissance of large cities outside of the capital has been driven by them becoming places of knowledge creation and diffusion, and this progress must not be squandered.
- **Big cities are the most promising places for levelling up.** As complex jobs have shown a preference to locate in these cities, policies to further improve their economies would go with the grain of changing trends in the British and global economy. The evidence shows that the Government's goal of an internationally competitive city in every region is achievable because the geography of knowledge in Britain has already changed to make it possible.
- **This research also offers a note of caution for those who urge local areas to 'build on their strengths'.** The cities and large towns which saw their relative economic complexity decline over the past four decades were those which had 'doubled down' on a single or few sectors which were complex in the 1980s, and did not broaden their export base beyond these activities, such as Aberdeen with oil. The most complex local economies are those which are strong across a large number of high-value, knowledge-intensive industries.

**In many struggling places, it is not what a place has, but rather what a place does not have that should be of concern.** Many places in the North and Midlands will not see a turnaround in their economies if they continue to focus on what they already have, particularly in lower-skilled parts of manufacturing and services. They need to focus on addressing the barriers that stop more complex activities from investing in their areas.

# 01

## Introduction

This autumn the Government will publish its Levelling Up White Paper, which will set out how it intends to deliver on a slogan that has been the bedrock of its domestic agenda.

There have been a number of policies badged under the levelling up banner, but the lack of well-defined purpose and strategy for delivery has meant that policy so far has boiled down to ad-hoc pots of money and symbolic prizes for certain priorities, such as freeports and civil servant relocations. In particular, these actions have not matched the Government's stated ambition in its recent Plan for Growth to have one internationally competitive city per region.<sup>1</sup>

This briefing uses the idea of economic complexity to show how different parts of the UK economy have developed over the last 40 years and sets out the implications for the Government's approach to its levelling up agenda.

It first looks at how complexity varies across urban Britain, revealing Britain's most and least complex cities and large towns; this paper also compares British cities with their French and German peers. It looks at how this has changed over time, using data from 1981 to show how the geography of complex activities has changed over the last 40 years. The observed changes provide evidence about which places have the highest 'productivity potential' and how levelling up should realise this.

## **Box 1: Methodology**

### **Definition of a city**

Centre for Cities research focuses on the UK's 63 largest towns and cities. Unless otherwise stated, cities and large towns are defined as Primary Urban Areas (PUAs), using a measure of the built-up area of a large city or town, which sometimes spans beyond the core local authority of a city. Due to data availability, Belfast is not included in this briefing.

### **Data used for this research**

This paper uses a number of publicly available datasets. These include the employment at the local authority level by industry from the 1981 Census ('1980 Standard Industrial Classification, 4-digit') and the UK Business Register and Employment Survey (BRES) for 2019 ('2007 Standard Industrial Classification, 3-digit'). Productivity levels for 2019 shown in the report are computed from ONS's Regional Gross Value Added (GVA) dataset and employment numbers from BRES.

Other sources include France's National Institute of Statistics and Economic Studies (Insee), and German Federal Statistics Office (Destatis).

# 02

## The geography of economic complexity in Britain

### What is economic complexity?

The creation and use of knowledge drives economic growth, whether through the invention and adoption of new technology, or improvements to the ways that we work and live.

‘Economic complexity’ as a concept attempts to capture this process of knowledge creation and diffusion. The amount of knowledge and know-how (in particular ‘tacit’ knowledge, which is mainly communicated face-to-face, as opposed to codified knowledge, which is written down) within an economy determines which activities exist and how complex they are.

Large amounts of accumulated knowledge enable economies to be more complex, which is associated with productivity. Meanwhile, places with low amounts of knowledge often specialise in activities that are associated with low complexity, which tend to compete on low-cost production by locating where production costs (e.g. labour and land) are cheaper.

Consequently, complex areas are more likely to generate networks of knowledge, which in turn drive new innovations and growth within existing industries, and aid transitions to new types of high-value activity.

For example, a place is more likely to move from computer software development to smartphone app development, than it is to go from shirt production to app development.<sup>2</sup> Moving from one complex activity to another is important for places that wish to sustain their prosperity and economic success over the long run, and indicates the importance of access to knowledge in creating and attracting new types of work and production. Box 2 discusses the definition of economic complexity in more detail.

## Box 2: Economic complexity, definition and methodology

**Definition** – The concept of economic complexity, developed by Hidalgo and Hausmann in 2009, examines countries' exports and identifies in which products an economy has a competitive advantage by analysing international trade data. A country is considered specialised in a product if it holds a revealed comparative advantage (RCA): its export share of a product is higher than the product's share in overall world trade.<sup>3</sup>

### **Revealed Comparative Advantage (RCA) = Sector's weights in one place is higher than its weight in the overall economy**

Under this approach, economies are defined on how diverse (how many products it has a specialisation in) they are; and how ubiquitous (number of places that are able to make a product) their areas of specialisation are.<sup>4</sup> As a result – by interacting diversity with ubiquity – it is possible to assign an Economic Complexity Indicator (ECI) for each geography, built upon Product Complexity Indicators (PCI) for each product, industry or activity. This idea is connected to the capabilities approach and the cross-industry “knowledge spillovers” ideas described by Jacobs.<sup>5</sup>

**As economic complexity is a relative concept, there will always be cities and large towns which are more complex than others, and other places which are less complex.** This is because the choices facing workers and firms are also relative – they face trade-offs between different locations which offer varying combinations of costs and benefits, and they ultimately make a relative choice between these available options.

### **What is complex economic activity?**

The economic complexity concept, by comparing activities across geographies, can identify how complex one activity is by simultaneously analysing its individual ubiquity (number of places that are able to make a product) but also how common the remaining activities in that economy are.

**Rare activity is not necessarily complex.** For instance, a product or activity that is rare only because of its geography (e.g. diamonds and oil) is likely to be located in a place that produces several non-rare (high ubiquity) goods (e.g. agricultural products). At the opposite end of the spectrum, a rare and complex activity is usually bundled next to other rare (low ubiquity) activities, suggesting that its production requires a certain level of accumulated knowledge in the economy. Complex activities such as software development are likely to be located next to other high-knowledge (complex) activities like pharmaceuticals or marketing.

**A complex economy is generally characterised by having competitive advantages in several high complexity activities.** Such a combination reflects

both economic diversity and the existence of the accumulated knowledge which the complex activity requires.

**The productivity of an economy is also linked to the size of its most complex activity.** If two economies have comparative advantages in the same sectors, the one with a higher employment share in the most complex jobs tends to be more productive as it has achieved greater specialisation.

### **Applying economic complexity at the urban level**

In recent years, economic complexity has been applied at the urban level in several countries including the UK and US.<sup>6</sup> Unlike cross-country comparisons, revealed comparative advantages are measured using employment data, instead of international trade data. A city or town has an RCA in a particular sector if employment in that activity is more prevalent than the overall average. For example, if mining represents 2 per cent of total employment in one country/region, all cities and large towns with more than 2 per cent of their workers working in mining will have a competitive advantage in that specific sector.

**For the purpose of this paper,** economic complexity for Britain as a whole considers all local authorities separately; while urban economic complexity solely covers the 62 Primary Urban Areas. A place will be considered complex if its respective Economic Complexity Indicator (ECI) is above zero. Moreover, Product Complex Indicator (PCI) is based on employment data by occupation. This approach assumes an equal PCI score for the same occupation in different cities and large towns, and so is conservative in its estimates.<sup>7</sup>

**In terms of economic sectors, economic complexity is only based on exporting activities.** Because they are not tied to a local market, these exporters could, in theory, locate anywhere but in reality cluster in certain places, and so it is these activities that are of particular interest.<sup>8</sup>

### **What are exporting businesses?**

Exporting businesses (also known as business to business (B2B) or tradable businesses) sell to regional, national or international markets (including manufacturing, software, advertising etc.). They form the export base of the local economy and bring money into it to be spent on local services (such as shops, cafes and barbers). The market these businesses sell to does not tie them to a specific location, and they are free to set up wherever they want so long as they can access their target market and access what they need to remain internationally competitive. Such exporting economic activities choose their location based on the respective competitive advantages. Given their different needs, high-value-added exporting activities and low-cost production activities are likely to be in different locations. For this research exporters and local services firms are defined using Standard Industrial Classification (SIC) codes.

## Some economic activity is more complex than others

Understanding the complexity of local economies first requires a measure of the complexity of the type of activity located within each place. By measuring the rarity of exporting occupations, and whether they are located alongside other rare activities, it is possible to rank all kinds of exporting activity and assign each a score, or Product Complex Indicator (PCI). The top and bottom ten occupations by complexity are shown in Table 1.

**Table 1: Exporting occupations by complexity, 2019**

Top 10 occupations	Bottom 10 occupations
Reinsurance	Mining of hard coal
Fund management activities	Manufacture of refractory products
Trusts, funds and similar financial entities	Manufacture of basic iron and steel and of ferro alloys
Advertising	Processing and preserving of meat and production of meat products
Manufacture of magnetic and optical media	Manufacture of tanks, reservoirs and containers of metal
Computer programming, consultancy and related activities	Manufacture of basic chemicals, fertilisers and nitrogen compounds, plastics and synthetic rubber in primary forms
Market research and public opinion polling	Manufacture of basic precious and other non-ferrous metals
Passenger air transport	Manufacture of other products of first processing of steel
Television programming and broadcasting activities	Casting of metals
Data processing, hosting and related activities; web portals	Manufacture of other fabricated metal products

Source: ONS, Centre for Cities' calculations.

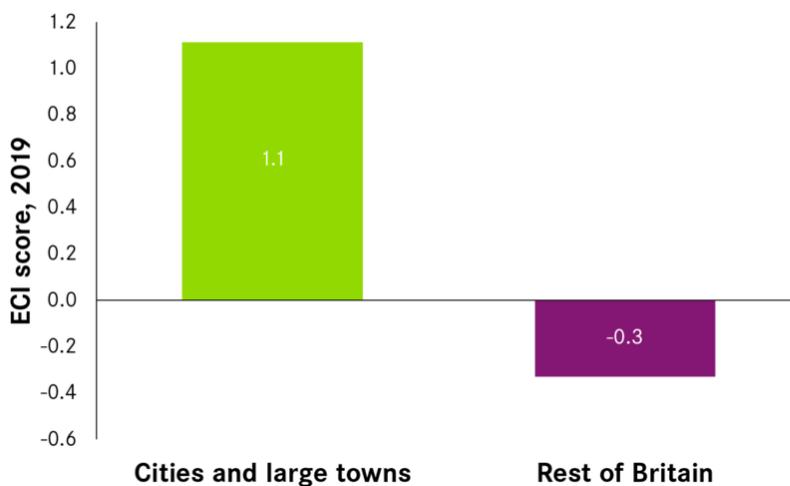
The most complex activities – typically rare activities that cluster next to other rare activities – such as finance, advertising and programming are services that are mostly located in city centres as they need pools of highly-skilled workers.<sup>9</sup> On the opposite side, activities with low complexity are more likely to be found in non-urban areas, suburbs, and poorer cities and large towns.

## Urban economies are more complex

The concentration of complex activity in sectors which value the benefits of cities can be seen in the geography of economic complexity across the UK. As Figure 1 shows, in 2019, urban areas were, on aggregate, substantially more complex than non-urban areas.

**Figure 1: Urban areas are more likely to be complex than non-urban areas**

National ECI at Local Authority level, 2019



Source: ONS; Centre for Cities' calculations.

Note: Weighted-average of economic complexity scores at the Local Authority level; the higher the score, the more complex the economy is. The most complex Local Authority is the City of London, followed by Tower Hamlets, while Dumfries and Galloway ranks last. Note that complexity scores are relative to other local authorities, meaning that there will always be local authorities with negative scores. As ECIs are a relative measure, values will differ depending on the set being used – a city which has a positive ECI when compared to all other urban and rural areas may have a negative one when compared just to other urban areas, or cities in foreign countries.

Cities provide deeper labour markets for firms, which allow them to achieve greater levels of specialisation and complexity. This is linked to firms' desires to access knowledge. As tacit (as opposed to codified) knowledge is best transmitted face-to-face, cities in principle have an inherent advantage in attracting more complex activities as they make it easier for people to exchange ideas and information ('knowledge spillovers').<sup>10 11</sup> These features are known as 'agglomeration effects' and put cities in a better position to attract complex businesses.<sup>12</sup> In 2015, city centres in Britain collectively accounted for 0.1 per cent of all land, but they accounted for 14 per cent of all jobs and 25 per cent of all jobs in more productive services businesses.<sup>13</sup>

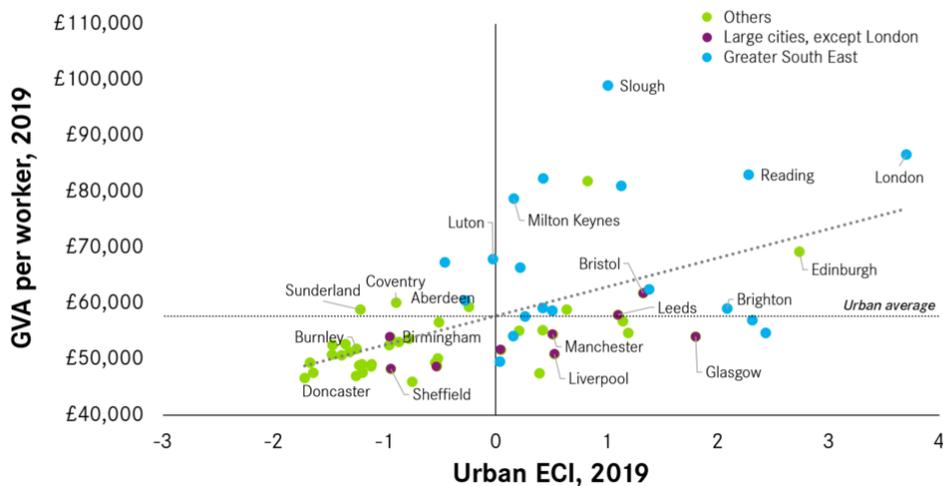
## Economic complexity is linked to productivity

The geography of economic complexity does not just differ across urban and non-urban areas. It also varies between cities and large towns, as different urban economies offer different benefits to exporting firms. If complexity is associated with economic performance as a reflection of the type of exporters present within a local economy, then we would expect to see more prosperous places to be more complex.

As Figure 2 shows, more complex economies tend to be more productive. Those cities and large towns in the top right quadrant have high complexity and high output per worker, while those in the bottom left quadrant have low complexity and low output per worker. Places are considered complex in this report if their respective Economic Complexity Indicator (ECI) is above zero.

**Figure 2: Highly complex economies are more productive**

Productivity and urban ECI at PUA level, 2019

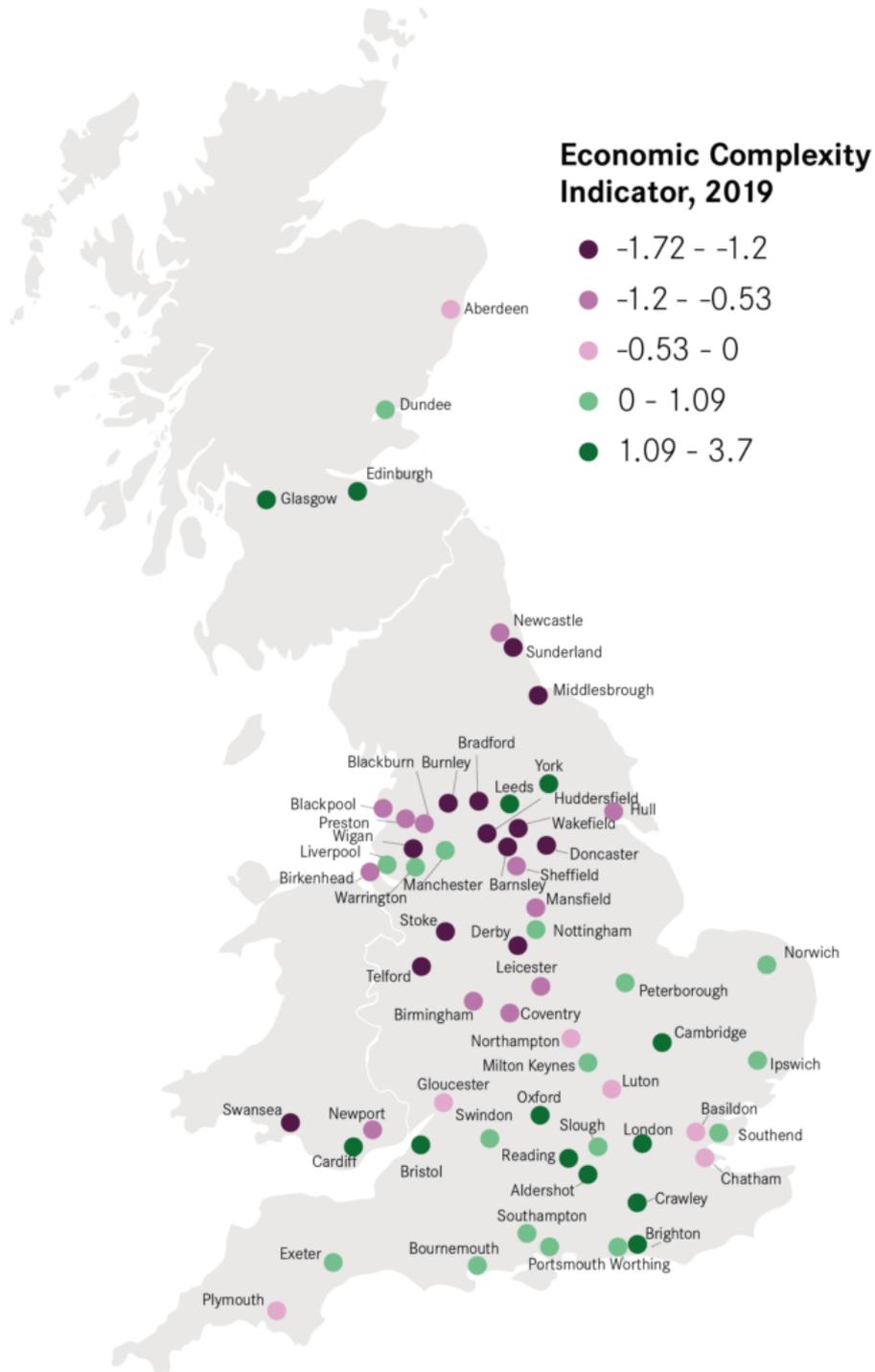


Source: ONS. Centre for Cities' calculations.

## Cities in the South are more complex than cities in the North

**Most cities and large towns that have both high complexity and productivity are located in the Greater South East.** As Figure 3 indicates, cities and large towns with lower levels of complexity are generally located in the North and Midlands, where their competitive advantages, such as distribution, warehousing and storage, usually require access to a different set of benefits – namely low-cost land and pools of lower-skilled workers and lower wages.

Figure 3: Cities in the South and big cities elsewhere are complex



Source: ONS. Centre for Cities' calculations.

As previous Centre for Cities research has shown, highly skilled exporters – which tend to be more productive – are predominant in the Greater South East because cities have been able to offer both access to lots of skilled workers and networks of other highly-skilled

businesses. Crucially for ongoing policy discussions around whether subsidies should be used to level up the economy, in order to access those advantages and the accumulated knowledge associated with them, these highly productive firms are willing to pay a premium in the form of more expensive commercial space and higher wages to locate in these parts of the country.<sup>12</sup>

## Big cities outside London are complex

Yet there is an exception to this North–South divide. A number of Britain’s biggest cities outside of London, such as Glasgow, Manchester, and Liverpool, are as complex as smaller cities in the South, as the map in Figure 3 shows, and as the scatter chart in Figure 2 does, highlighted in purple. This indicates that these cities do have qualities that appeal to firms and workers engaged in complex economic activity.

## But these large cities are not very productive

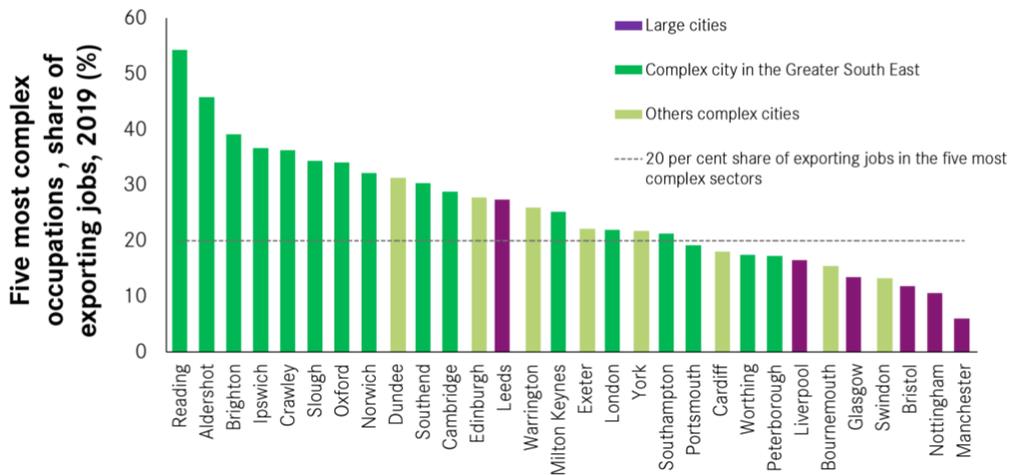
**However, big cities have productivity levels below the urban average, despite being relatively complex economies.** The scatter chart in Figure 3 demonstrates that Bristol exceeds the urban average, whereas Manchester, Glasgow, Leeds, and Liverpool despite being highly complex are not especially productive. The observed mismatch – productivity underperforming relative to complexity – suggests that these cities have not been able to make the most of their most complex economic activities.<sup>15</sup>

**The underperformance of most big cities is partly explained by the relatively small size of their most complex activities** – it is possible for a city to have a competitive advantage in an industry but for that industry to only play a small role in the economy.<sup>16</sup>

Currently, most large cities have competitive advantages in some complex activities. However, those sectors employ a comparatively low share of workers when compared with the most successful economies in the Greater South East. Figure 4 demonstrates that these complex Southern cities tend to have more than 20 per cent of their exporting jobs in their five most complex activities, while the big cities are less specialised. As a consequence, big cities’ most complex activities – and therefore most productive – are not large enough to drive up overall productivity.

**Figure 4: Unlike the most successful economies in the Greater South East, complex sectors in the UK’s biggest cities tend to employ less than 20 per cent of the total number of exporting workers**

Complex cities: size of most complex sectors in the economy, 2019



Source: ONS; Centre for Cities’ calculations. Complex cities defined by places with ECI above zero.

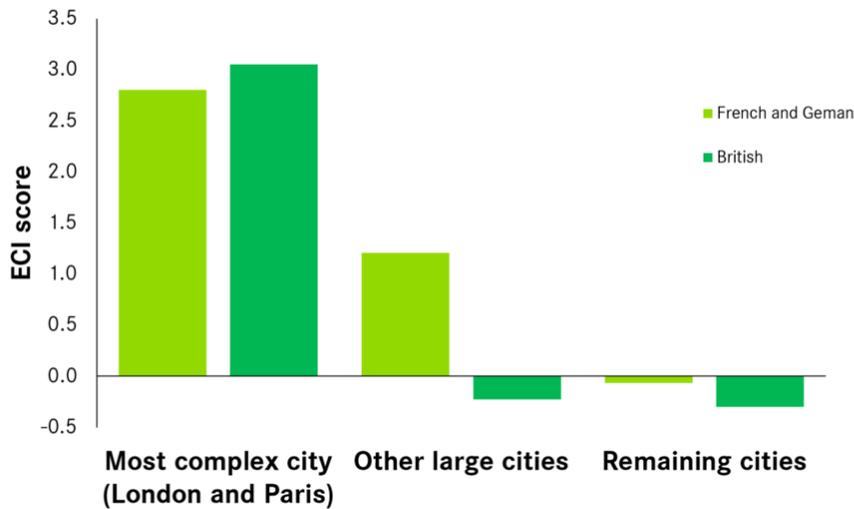
For example, Glasgow and Brighton are similarly complex but their productivity differs substantially. Brighton, a city that is highly productive, has 54 per cent of its exporting jobs in its most complex activities. In Glasgow – where productivity is below the national average – only 13 per cent of its exporting jobs are in its most complex occupations.<sup>17</sup>

## Despite being relatively complex in the British context, big cities are less complex than their French and German equivalents

The picture is the same when comparing UK cities to their European peers. In line with their low productivity, the largest British cities lag their French and German peers in terms of economic complexity, as can be seen in Figure 5.<sup>18</sup>

**Figure 5: Big cities significantly lag their German and French counterparts**

Urban ECI: British, German and French cities



Source: ONS, INSEE and Destatis.

Of the eighteen largest French and German cities identified, all of them have high complexity.<sup>19</sup> In contrast, only three out of nine British cities (Bristol, Leeds and Manchester) had complexity levels above this average.<sup>20</sup> Smaller cities and towns in Britain also lag their French counterparts, but the gap is much smaller than for large cities.

Complex activities have increasingly shown a preference to locate in Britain’s big cities, and the evidence shows that as complex local economies, big cities are places of knowledge creation and diffusion. While this has not yet been observed in high levels productivity, the experience of French and German cities provides grounds for optimism. Their big cities are yet more complex than those in the UK, suggesting that there is still room for the UK’s big cities to progress further.

# 03

## The past four decades of economic complexity (1981-2019)

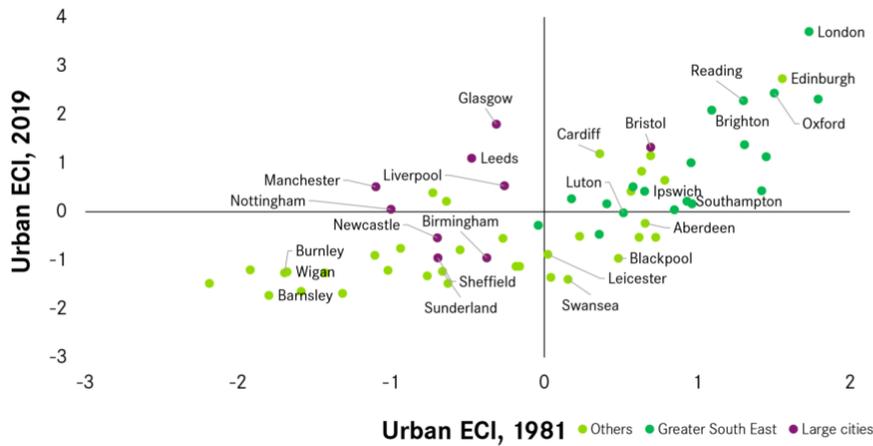
The puzzle of why big cities are complex but not especially productive can be answered by looking back through history. Using data from the Census in 1981 to compare economic complexity in the same cities across an almost forty-year period provides insights into how their economies and the national economy have or have not changed.

### Cities that are complex today were usually complex in 1981 too

**The majority of cities that were the most complex in 1981 are also the most complex today.** As Figure 6 shows, cities and large towns in the Greater South East had a higher likelihood of attracting knowledge-intensive workers and businesses. Box 3 looks in more detail at London's development over this period which goes well beyond the general characterisation of the impact of the 'Big Bang'.

**Figure 6: Most Greater South East cities remained complex between 1981 and 2019, while big cities became more complex**

Economic complexity, 1981 and 2019



Source: ONS; Census, 1981. Centre for Cities' calculations.

**At the opposite end of the spectrum, most cities and large towns in the North and Midlands remained 'trapped' in low complexity economies.** With comparatively little knowledge in 1981, these cities have since struggled to attract new innovative businesses, which would have consequently increased their productivity.

### Box 3: London’s growth and the role of the financial sector

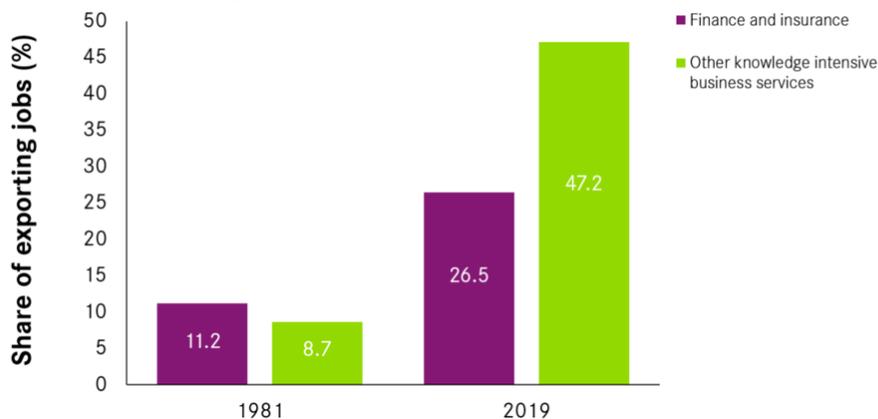
The rise of London over the past 40 years is generally associated with the ‘Big Bang’, a set of financial deregulations in the mid-80s that led to the expansion of the financial sector. However, London’s success cannot be entirely explained by the rise of finance. London did not just simply replicate its existing strengths in finance. The capital was also able to attract talent, innovate and diversify its economic base across a number of sectors.

These changes are in line with how the economic complexity theory describes development, as complex places are not just highly specialised – they also find it easier to successfully transition into new high-value activity and industries.

The growth of finance happened within the context of specific changes in the industry itself, combined with globalisation and an overall economic shift towards the service sector. When compared with other knowledge-based services, London’s growth of finance-related jobs was dwarfed by sectors like programming, design, advertising, and research. Figure 7 shows that in 2019, other knowledge-based services (e.g. design, computer programming, advertising) accounted for 47.2 per cent of all exporting jobs, above the 26.5 per cent from Finance and Insurance related activities.

**Figure 7: Finance-related employment rose but not as much as knowledge intensive services**

Finance and knowledge intensive business services, 1981 and 2019



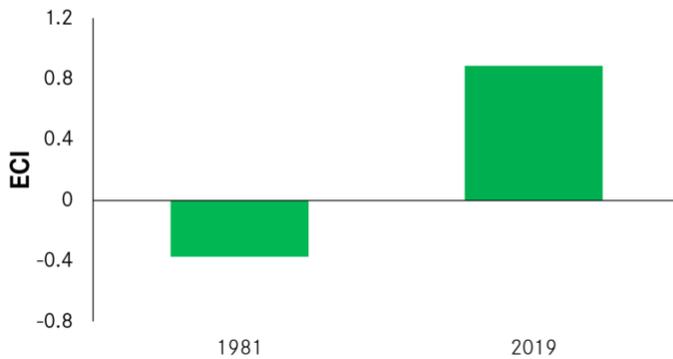
Source: ONS; Census, 1981.

## Big cities are an exception, and have become more complex over time

**Most big cities were able to break out of the ‘low complexity’ trap and substantially increase their complexity.** The relatively complex nature of the economies of large cities today is the result of four decades of improvement. This has meant that as a group, Britain’s large cities (excluding London) have shifted from having below-average levels of complexity in 1981 to being substantially more complex than the urban average today, as shown in Figure 8.

**Figure 8: Most of the largest cities have become substantially more complex in the last four decades**

Complexity of the largest cities, 1981 and 2019



Source: ONS; Census, 1981. Centre for Cities’ calculations. Urban ECI computed at the Local Authority level including all local authorities. City’s ECI computed at the PUA level, including urban areas only. Largest cities measured by total employment and ECI scores are a weighted average considering each PUA’s size.

Note: The cities considered as largest are the following: Birmingham; Bristol; Glasgow; Liverpool; Leeds; Manchester; Newcastle; Nottingham; Sheffield.

From the 63 cities under analysis, **Manchester is the city that improved its economic complexity the most, in relative terms, followed by Glasgow.**<sup>21</sup> Manchester was the 52<sup>nd</sup> most complex economy in Britain in 1981 – today it is 18<sup>th</sup>. Likewise, Glasgow was the 38<sup>th</sup> most complex city, and today it is 7<sup>th</sup>. Leeds went from being the 40<sup>th</sup> to the 13<sup>th</sup> most complex economy, and Liverpool moved from 36<sup>th</sup> to 17<sup>th</sup>.

The re-emergence of the largest cities is not a phenomenon specific to the UK, but is a part of a global shift that larger cities have been able to benefit from the most.<sup>22</sup> But across the largest cities, Birmingham and Sheffield are the two exceptions: they had comparatively low complexity economies in 1981 and saw their complexity decline in relative terms.

As Box 4 discusses, big cities were unusual in that they were to attract complex businesses without having a large share of jobs in related activities by 1981. Big cities have begun to prosper because of this change.

#### **Box 4: Cities can develop industries without previous knowledge in similar areas - especially large cities**

In recent years, some of Britain's largest cities were able to become relatively more complex by specialising in new high-knowledge activities. Data at the occupational level suggests that in some cases – often in Britain's biggest cities – the observed improvements were unlikely to be a result of the existing economic structure in 1981.

##### **Computer-related activities**

In 2019, economies with a strong IT-related sector were generally specialised in electronics-related occupations in 1981 with both sectors being considered complex in 2019 and 1981 respectively.<sup>23</sup> Half of the cities with a competitive advantage in the IT sector – such as Reading, Slough, London or Brighton – were specialised in electronics activities in 1981, as shown in Figure 9.

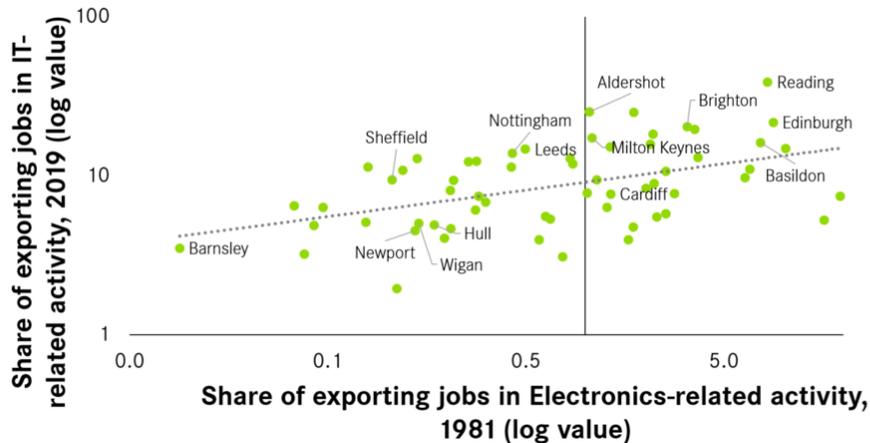
Nevertheless, Leeds and Nottingham were able to specialise in IT-related activities by 2019, without having an electronics' legacy from 1981; Nottingham ranked 37<sup>th</sup> out of 62 cities in terms of being specialised in electronics and is now 14<sup>th</sup> in the country for IT.

A similar trend can be found in a number of other activities. Liverpool was able to build a competitive advantage in research-related activities, one of the most complex sectors the city has today, despite being ranked 49<sup>th</sup> out of 63 cities in Research and Development activities in 1981.<sup>24</sup> Additionally, cities like Manchester and Nottingham were some of the least specialised economies in telecommunications in 1981; but had developed a competitive advantage in wireless telecommunications activities by 2019.

Economic complexity theory suggests that places develop specialisms based on previous specialisms. At the city level, this analysis suggests that having a previous specialism may not be a necessary condition to develop one today. If cities can attract talent, therefore increase their accumulated knowledge, complex economic activities are likely to emerge.

**Figure 9: Economies focused on electronics were more likely to move towards IT-related occupations but there are some notable exceptions**

Electronics-related occupations (1981) and IT-related occupations (2019)



Source: ONS; Census, 1981.

The big picture is that the geography of knowledge in 2019 is less Southern than it was in 1981, because big cities outside London in the Midlands, North of England, and Scotland have become much more important places of knowledge creation.

## Big cities have benefitted from how the economy has changed, not from policy bias

The turnaround of most of Britain's large cities goes somewhat against economic complexity theory, which says that the evolution of an economy is related to its past specialisms.

One explanation in the public debate is that large cities have been explicitly favoured by policy in recent decades. This has sucked jobs into cities, so the argument goes, at the cost of their surrounding areas.

But finding evidence for this view is difficult. First, there is no consistent pattern of pro-urban policy over this period. For instance, the Local Government Act 1986 abolished the Greater London Council and the metropolitan county councils, and these were not reversed until 2000 and the 2010s respectively.

Second, there have been city-specific policies, such as Michael Heseltine's City Challenge or City Deals under the Cameron-led government.<sup>25</sup> But as Box 5 illustrates, in the wide gamut of local growth policies that have been put in place in the last 40 years, very few have been city focussed.

Furthermore, all local growth policies tend to be relatively marginal compared to other policies or spending decisions by national government. This affects how the nationally economy adapts and changes, with consequences for local economies too.

### **Box 5: A timeline of sub-national policies**

While not exhaustive, the below sets out a long list of local growth initiatives that have been put in place since the 1980s. Only three have had an explicit city focus – City Challenge, City Deals and Mayoral Devolution Deals. Meanwhile, there have been a number of initiatives that have been more explicit in not having a city focus, such as the creation of the Coalfield Regeneration Trust, Coastal Communities Fund and the recently announced Towns Fund. The dates below are the year the policy was introduced.

**1981** – Enterprise Zones

**1991** – City Challenge

**1999** – Coalfield Regeneration Trust

**1997** – Single Regeneration Budget

**1998** – Regional Development Agencies

**2001** – Neighbourhood Management Pathfinder Programme

**2001** – New Deal for Communities

**2006** – Local Enterprise Growth Initiative

**2011** – Local Enterprise Partnerships

**2011** – City Deals

**2012** – Coastal Communities Fund

**2012** – Enterprise Zones

**2014** – Local Growth Fund

**2014** – Mayoral Devolution Deals

**2019** – Towns Fund

**2019** – Future High Streets Fund

**2021** – Levelling Up Fund

Another explanation for why large cities have improved over the past forty years is that the national and global economy has moved from manufacturing towards knowledge-based services. The inherent benefits that large cities offer has meant they have been well-positioned to make the most of this change.

And, cities have benefitted from non-spatial policies that were introduced by successive governments over the past 40 years. For instance, the expansion of higher education has seen the growth of universities that are largely city-based and immigration policy has also benefited London in particular. But this has not been the result of an explicit policy focus towards cities, but rather one that implicitly benefits cities due to their role in driving economic growth.

In other words, the big cities are stepping into a new role that the global economy has demanded of them. As their relationship to knowledge has changed and improved so much since 1981, their current productivity underperformance suggests this process is unfinished. Further improvements to their economic performance are possible.

### **‘Building on your strengths’ is unlikely to turn around struggling economies**

Yet not every urban area has seen its relative economic complexity improve. When looking at the cities and large towns that have struggled in Figure 6, the data suggests policymakers should be cautious about economic strategies that encourage struggling places to ‘build on their strengths’ and ‘smart specialisation’. These cities have either failed to transition from activities that were complex in 1981 to new industries that are complex in 2019, or they have replaced one set of low-knowledge activities with another set of low-knowledge activities. They fall broadly into three groups:

### **Complex cities that did not develop new specialisms are less complex today**

In contrast to the improving complexity of many large cities, there is a group of cities and large towns where the opposite is the case, and which have become less complex. Cities and large towns found in the bottom right of Figure 6 – such as Aberdeen, Blackpool and Swansea – have taken a backward step in the last 40 years. They had above-average levels of complexity in 1981 but have below-average levels in 2019.

A common characteristic of these places is that they continued to specialise in the same activities as they did in 1981 while the global economy has shifted towards knowledge-based services, as Table 2 shows. Aberdeen has not moved beyond oil. Blackpool continues to specialise in aerospace manufacture. And steel still dominates in Swansea.

**Table 2: Those places that continued to specialise in the same industries became less complex**

PUA	1981	2019	Complexity (1981-2019)
Edinburgh	Radio/electronic capital goods (8.2%)	Computer programming, consultancy and related activities (19.0%)	Remained high
London	Banking/bill-discounting (8.4%)	Computer programming, consultancy and related activities (16.8%)	Remained high
Reading	Electronic data processing equipment (4.8%)	Computer programming, consultancy and related activities (37.4%)	Remained high
Aberdeen	Extraction: mineral oil/natural gas (24.5%)	Extraction: mineral oil/natural gas (28.3%)	Deteriorated
Blackpool	Aerospace manufacture/repairing (20.6%)	Aerospace manufacture/repairing (26.7%)	Deteriorated
Swansea	Iron and Steel industry (12.1%)	Manufacture of basic iron and steel and of ferro-alloys (13.6%)	Deteriorated

Source: ONS; Census, 1981.

This is in contrast to those cities and large towns that remained complex throughout the period, such as Reading and Edinburgh. These cities changed their main specialisation patterns from electronics to IT-related activities, allowing them to maintain their comparatively high productivity levels.

### Cities dominated by a single industry

Cities with low complexity today tended to be more specialised in a single activity in 1981, having on average 18.8 per cent of their exporting jobs in a single occupation, compared to the urban average of 11.1 per cent. From the 15 cities that were dominated by a single industry (20 per cent or more of their exporting jobs) in 1981, only three are complex today.<sup>26</sup>

This is likely to be because overreliance on a small number of activities has limited the ability of cities to innovate and move to new economic activities.<sup>27</sup> The observed dynamic has similarities with the economic concept of the 'resource curse', which argues that high reliance on few economic activities, associated with natural resources hinders long-term growth.<sup>28</sup>

## Cities that moved from one low complexity activity to another

The final set of cities are those that have been ‘trapped’ in low complexity activities of different types over the past four decades, shown in the bottom left of Figure 6.

These cities offer a counterexample to the experience of most large cities. Like the large cities, their development also appears to have been guided by the inherent benefits that they offer to businesses, rather than their past industrial structure. The problem is that the benefits they have offered, such as large pools of labour and cheap land or geographic location, have appealed to lower productivity and lower wage activities (e.g. warehousing, distribution or food manufacturing).

Of the 22 cities and large towns that are ‘trapped’ in low complex activities, six of them specialised in coal mining in 1981. Today, these urban areas have moved away from coal, and are specialised in other activities, as Table 3 shows. None of these sectors are related to coal mining, suggesting their earlier specialism driven by the location of coal seams had no direct impact on the subsequent specialisms they developed.

**Table 3: Most prevalent exporting occupation as share of exporting jobs, 1981-2019**

PUA	1981	2019
Barnsley	Deep coal mines (40.8%)	Warehousing and storage (18.8%)
Doncaster	Deep coal mines (34.9%)	Warehousing and storage (20.7%)
Mansfield	Deep coal mines (26.6%)	Manufacturing of plastic products (12.3%)
Sunderland	Deep coal mines (10.8%)	Manufacturing of motor vehicles (17.7%)
Wakefield	Deep coal mines (29.1%)	Warehousing and storage (29.5%)
Wigan	Deep coal mines (8.1%)	Manufacturing of food products (15.8%)

Source: ONS; Census, 1981.

But all are lower skilled activities, suggesting that it is the inherent benefits – often driven by indirect legacy of previous activities (e.g. contamination affecting land values) – that these places offer to businesses that has driven their development, rather than the specific accumulated knowledge from past industrial structure. Box 6 gives an example of how policy that aims to increase economic growth can sometimes inadvertently reinforce these qualities, and how replicating the existing geography of knowledge does not always mean retaining the same industrial structure.

### **Box 6: Industrial structure did not attract Nissan to Sunderland**

In 1984, the British government and Nissan reached an agreement to open a car plant in Sunderland.<sup>29</sup> Before the car plant, Sunderland's economy was mostly dominated by coal mining and shipbuilding.<sup>30</sup> There is little evidence that the accumulated knowledge derived from such activities was the reason why Nissan located in Sunderland.

If Nissan had located in Sunderland mainly as a result of the specific capabilities built from previous industries, we should expect to see a strong relationship between coal mining and shipbuilding with car manufacturing in other British cities.

Figure 10 shows that there is no relation between Sunderland's previous advantages and the likelihood of making vehicles. Cities that mined lots of coal and built lots of ships are now unlikely to build lots of cars. Likewise, cities that today are centres of automobile production are very unlikely to have been centres of coal and ship production in the past.

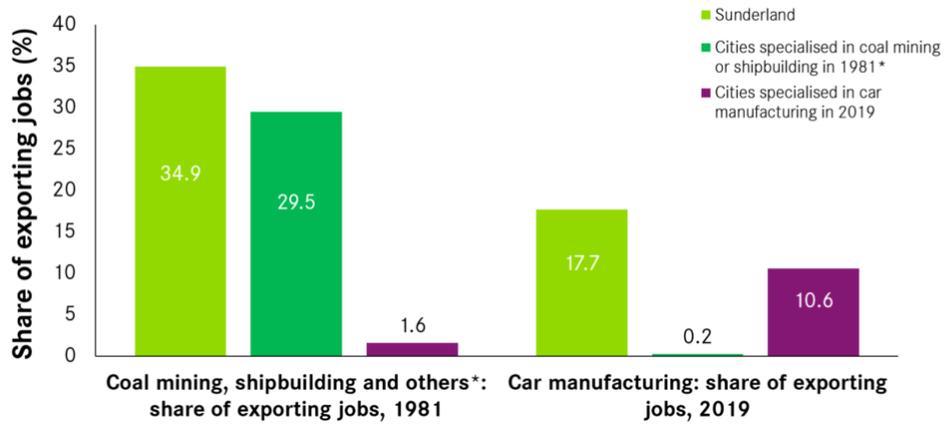
Urban economies with some degree of specialisation in car manufacturing today did not share Sunderland's economic features in 1981. Unlike Sunderland, Coventry and Birmingham transitioned from cycle to car manufacturing in the previous century.<sup>31</sup>

At the same time, places focused on mining and shipbuilding like Barnsley or Doncaster did not move their economic structure towards car manufacturing. Sunderland was able to attract Nissan due to other benefits, such as public subsidies, that were not directly related to the accumulated knowledge and capabilities from its previous industrial structure.

Instead, it was the characteristics of Sunderland's labour and real estate markets – cheap labour and land – that indirectly supported Nissan's choice of Sunderland. These were associated with Sunderland's economy as a centre of shipbuilding and coal mining, but could also be found in other cities across the country in the 1980s.

**Figure 10: Cities and large towns with car manufacturing plants today were not similar to Sunderland in the early 80s**

Share of car manufacturing (2019), coal mining and shipbuilding(1981)



Source: ONS; Census, 1981.

Methodology: Top five car manufacturing cities in 2019 include Oxford, Coventry, Luton, Liverpool and Birmingham.

\*The most similar cities to Sunderland in 1981 are Barnsley, Plymouth, Doncaster, Mansfield, Portsmouth and Newcastle, based on their percentage of 1981 jobs in the following sectors: deep coal mining; Shipbuilding and repairing; Other glass products; Mechanical lifting/handling equipment; and active components/sub-assemblies.

# 04

## Implications for levelling up

Looking at economic complexity in Britain and how it has changed over the past 40 years offers three main policy messages for levelling up.

### **1. Levelling up the economy must focus on the geography of knowledge**

Levelling up has a clear economic component. Numerous schemes and proposals have been argued to meet the definition of levelling up on this basis.

Yet this report shows that for levelling up to truly occur, it must continue to alter the geography of knowledge in Britain. Over the past four decades this has already begun to change, as the renaissance of Britain's large cities outside of the capital has been driven by them becoming places of knowledge creation and diffusion.

More specifically, levelling up requires policymakers to be aware of two distinct ideas. First, levelling up will only be achieved if it increases the amount of highly skilled exporting work in the private sector outside of the Greater South East. The existing variation in economic performance across the country is caused by the behaviour of firms in the private sector that bring money into their local economies, and improving their ability to access and use knowledge in other parts of the country is how that variation can be changed.

Second, any attempts to change the geography of high-skilled, private sector exporting work must have a strategic focus on the specific places across the country where it can flourish. Knowledge is created and shared by people exchanging ideas, and this kind of communication is more likely to occur in locations with more conversations, more activity, and more people.

In contrast, more public sector jobs, more local services work such as in shops and cafes, and more low-skilled exporting jobs will do little to level up the economy. While there are good arguments for boosting state capacity in local government, or ending austerity to

improve public services in “left behind” parts of the country, these alone will not have a direct impact on improving economic performance and living standards within local areas.

## **2. Big cities are the most promising places for levelling up**

The mismatch of the big cities, between their growing role as places of knowledge creation and their current economic underperformance, is why we see such stark differences in economic performance across the country. Especially when compared to other countries, big cities in the UK stand out as places of unfulfilled potential. If this potential could be realised, Centre for Cities has calculated it would generate £48 billion per year in the national economy, which would be in reach of city residents and of people living in towns and rural areas nearby.<sup>32</sup>

The conditions are there in big cities to make real progress in closing this gap, due to the growing complexity of their economies in recent years. As a result, the Government’s aspiration to have an internationally competitive city in each region is achievable and is the most plausible process by which levelling up can be realised in the foreseeable future. In particular, the Government will not level up the economy if it ignores the potential of Birmingham, Glasgow and Manchester.

This focus need not come at the cost of ignoring smaller places. But policy must recognise that its ability to bring about economic change in these places is more limited, and the outcomes of success (should it be achieved) for the national economy are smaller.

## **3. Calls for places to ‘build on their strengths’ should be received with caution**

Recent calls by some northern Conservative MPs for levelling up to focus on manufacturing in the North is the latest in the long line of rallying calls over the years for struggling places to build on their strengths.<sup>33</sup> The analysis above shows that the challenge is what these places are missing, rather than what they have. The aim of policymakers, especially local leaders, should therefore be to change the nature of these inherent benefits where they have the ability to do so, such as improving the skills of workers, to help them to reinvent their economies rather than further replicating what they already have.

There are two further implications of the economic complexity analysis for these places. First, levelling up will take decades to be successful. The experience of the big cities since 1981 shows that it takes time to change the geography of knowledge.

Second, we should not expect every part of the UK to be equally economically complex. Trying to make everywhere the same will simply “decapitate the tall poppies”<sup>34</sup> and damage prosperous places because there will always be some places that possess a competitive advantage in low-cost production. While local government should always be trying to make their local economies more complex and should have the resources they

need to do so, the priority for national government in the places that are low complexity should be supporting their living standards and wages.

Historically, this has often been done through redistribution and the welfare state, but sustaining demand for cities' exports in other parts of the country and world is just as important. Planning reforms to increase disposable incomes by reducing housing costs in affluent parts of the country are one mechanism that will help achieve this, even if their primary objective is to address the housing shortage.<sup>35</sup>

In addition, Centre for Cities' recent briefing *So You Want to Level Up* sets out the six areas policy should focus on to achieve levelling up: skills, devolution, public services, local transport, city centres and R&D spending. Detailed proposals on each are set out in the publication.<sup>36</sup>

# 05

## Appendices

### Appendix 1: Economic complexity indicators

Table 4: ECI at urban level (PUA) 1981 and 2019. Large cities highlighted

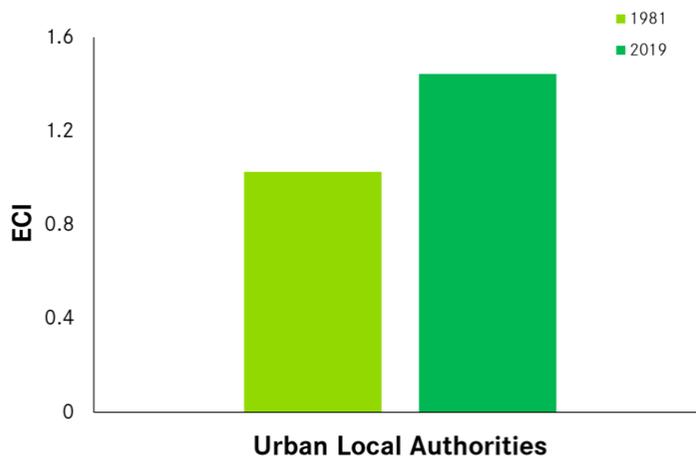
PUA	ECI (2019)	Rank (2019)	ECI (1981)	Rank (1981)	Rank change: 1981-2019
London	3.7	1	1.7	2	1
Edinburgh	2.7	2	1.6	3	1
Oxford	2.4	3	1.5	4	1
Cambridge	2.3	4	1.8	1	-3
Reading	2.3	5	1.3	8	3
Brighton	2.1	6	1.1	9	3
<b>Glasgow</b>	<b>1.8</b>	<b>7</b>	<b>-0.3</b>	<b>38</b>	<b>31</b>
Crawley	1.4	8	1.3	7	-1
<b>Bristol</b>	<b>1.3</b>	<b>9</b>	<b>0.7</b>	<b>17</b>	<b>8</b>
Cardiff	1.2	10	0.4	27	17
York	1.1	11	0.7	16	5
Aldershot	1.1	12	1.5	5	-7
<b>Leeds</b>	<b>1.1</b>	<b>13</b>	<b>-0.5</b>	<b>40</b>	<b>27</b>
Slough	1.0	14	1.0	11	-3

Swindon	0.8	15	0.6	20	5
Exeter	0.6	16	0.8	14	-2
<b>Liverpool</b>	<b>0.5</b>	<b>17</b>	<b>-0.3</b>	<b>36</b>	<b>19</b>
<b>Manchester</b>	<b>0.5</b>	<b>18</b>	<b>-1.1</b>	<b>52</b>	<b>34</b>
Peterborough	0.5	19	0.6	22	3
Worthing	0.4	20	1.4	6	-14
Ipswich	0.4	21	0.7	19	-2
Bournemouth	0.4	22	0.6	23	1
Dundee	0.4	23	-0.7	47	24
Portsmouth	0.3	24	0.2	30	6
Southampton	0.2	25	0.9	12	-13
Warrington	0.2	26	-0.6	43	17
Milton Keynes	0.2	27	0.4	26	-1
Norwich	0.2	28	1.0	10	-18
<b>Nottingham</b>	<b>0.0</b>	<b>29</b>	<b>-1.0</b>	<b>50</b>	<b>21</b>
Southend	0.0	30	0.9	13	-17
Luton	0.0	31	0.5	24	-7
Aberdeen	-0.2	32	0.7	18	-14
Basildon	-0.5	33	0.4	28	-5
Northampton	-0.5	34	0.2	29	-5
Plymouth	-0.5	35	0.6	21	-14
Gloucester	-0.5	36	0.7	15	-21
<b>Newcastle</b>	<b>-0.5</b>	<b>37</b>	<b>-0.7</b>	<b>46</b>	<b>9</b>
Birkenhead	-0.5	38	-0.3	37	-1
Blackburn	-0.8	39	-0.9	49	10
Preston	-0.8	40	-0.6	41	1
Leicester	-0.9	41	0.0	33	-8
Coventry	-0.9	42	-1.1	53	11
<b>Sheffield</b>	<b>-0.9</b>	<b>43</b>	<b>-0.7</b>	<b>45</b>	<b>2</b>
<b>Birmingham</b>	<b>-1.0</b>	<b>44</b>	<b>-0.4</b>	<b>39</b>	<b>-5</b>
Blackpool	-1.0	45	0.5	25	-20
Hull	-1.1	46	-0.2	35	-11

Newport	-1.1	47	-0.2	34	-13
Mansfield	-1.2	48	-1.9	60	12
Bradford	-1.2	49	-1.0	51	2
Sunderland	-1.2	50	-0.7	44	-6
Wigan	-1.2	51	-1.7	57	6
Burnley	-1.3	52	-1.7	58	6
Doncaster	-1.3	53	-1.4	55	2
Derby	-1.3	54	-0.8	48	-6
Telford	-1.4	55	0.0	32	-23
Swansea	-1.4	56	0.2	31	-25
Middlesbrough	-1.5	57	-0.6	42	-15
Wakefield	-1.5	58	-2.2	61	3
Huddersfield	-1.6	59	-1.6	56	-3
Stoke	-1.7	60	-1.3	54	-6
Barnsley	-1.7	61	-1.8	59	-2

**Figure 11: As referenced in Section 2, economic complexity in urban areas increased in the last four decades**

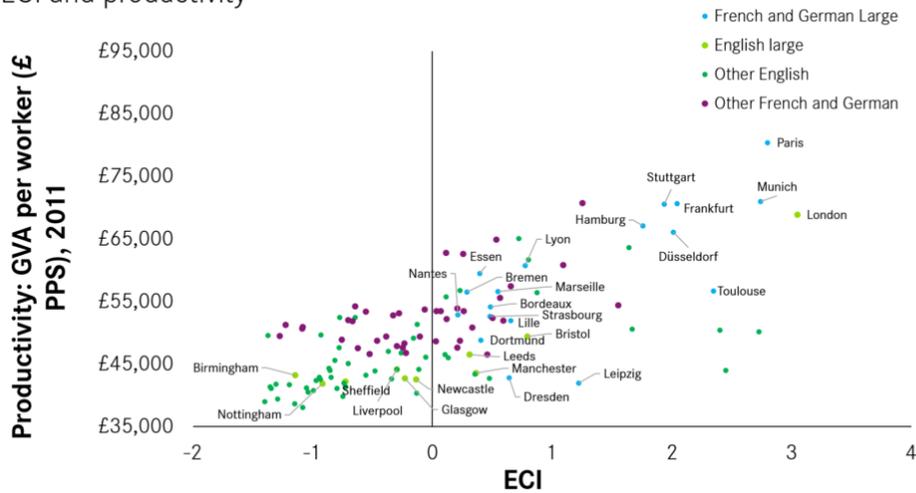
Complexity at urban level and largest cities, 1981 and 2019



## Appendix 2: Economic complexity indicators in comparison with German and French counterparts

Figure 12: Urban ECI from British, French and German cities is highly correlated with their productivity levels.

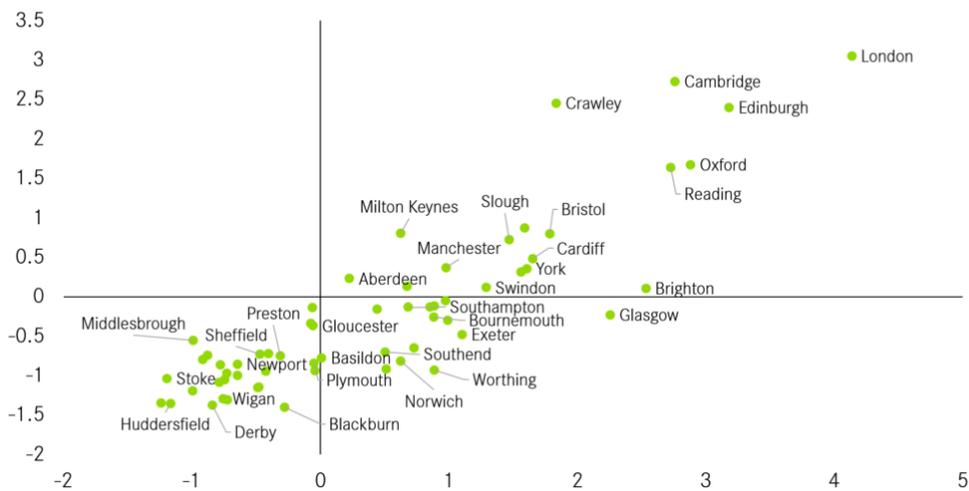
ECI and productivity



Source: EUROSTAT, ONS, INSEE and Destatis.

Figure 13: As referenced in Section 2, the European analysis is consistent with the British urban scores

ECI scores: British cities



Source: ONS, INSEE and Destatis.

## Endnotes

- 1 Her Majesty's Treasury, (2021) Build Back Better: Our Plan for Growth
- 2 Hausmann R, Hidalgo CA, Bustos S, Coscia M, Chung S, Jimines J, Simoes A, Yildirim MA (2013) The Atlas of Economic Complexity: Mapping Paths to Prosperity, Cambridge: MIT Press.
- 3 Hausmann R and Hidalgo CA (2009) "The Building Blocks of Economic Complexity, Proceedings of the National Academy of Sciences.
- 4 Our economic complexity calculations are based on the 'Method of Reflections' in line with Hausmann R, and Hidalgo CA (2009) "The Building Blocks of Economic Complexity", Proceedings of the National Academy of Sciences.
- 5 Jacobs J (1963) The Economy of Cities, New York: Vintage Press.
- 6 Mealy, P and Coyle, D (2019) "Economic complexity analysis": A technical report for the research on Innovation & Global Competitiveness, Manchester: Greater Manchester Independent Prosperity Reviet; Benedikt, S F and Manduce, R (2019) "The Economic Complexity of US Metropolitan Areas".
- 7 This methodology is not able to make distinctions in complexity between jobs under the same occupational code. The alternative, where we instead assume that the complexity of the same type of work could vary between places would likely show greater relative differences in complexity between cities (consider the difference between QCs in Magic Circle firms in London and local solicitors in towns).
- 8 Both Mealy and Coyle (2019); and Fritz and Manduca (2019) consider both exporters and local services in their Economic Complexity Indicators. That said, as Fritz and Manduca (2019) mention, there are several economists who identified the specific importance of exporters to urban economies.
- 9 Defined solely by exporting sectors, see Box 2 for further details.
- 10 For example, for the advertising industry in Manhattan it has been estimated that these knowledge spillovers operate over a distance of just over 750 metres, while other research finds that these agglomeration effects are strongest over a distance of one mile. Further details: Arzaghi M & Henderson J (2008) Networking Off Madison Avenue, Review of Economic Studies (October 2008), pp. 1011-1038; Rosenthal S & Strange W (2003) Geography, Industrial Organization, and Agglomeration, Review of Economics and Statistics (May 2003), pp. 377-393.
- 11 The labour pool that businesses have access to stretches well beyond its boundaries. Although this is likely to vary depending on geography, previous research suggests that this effect extends up to a drive time of 80 minutes from a British city, with the effect becoming weaker as distance from a city increases.
- 12 Swinney P (2018), The wrong tail? London: Centre for Cities; Clayton N and Serwicka I (2017), Trading Places 2: The role of cities in delivering the industrial strategy, London: Centre for Cities

- 13 Swinney P and Serwicka I (2016), *Trading Places: Why firms locate where they do*, London: Centre for Cities
- 14 Swinney P (2018), *The wrong tail?* London: Centre for Cities; Clayton N and Serwicka I (2017), *Trading Places 2: The role of cities in delivering the industrial strategy*, London: Centre for Cities
- 15 Swinney, P (2021), *So you want to level up?* London: Centre for Cities
- 16 Complexity looks at employment within an industry relative to other parts of the country. It does not take account of that industry's size relative to other industries within the same economy.
- 17 Most complex activities are defined as the five occupations with the highest Product Complexity Index (PCI) for each city.
- 18 As economic complexity exists as a concept relative to other economies, the large cities in UK now have negative complexity values in this sample.
- 19 High complexity defined by a ECI score above zero. As complexity is a relative concept, cities that have positive complexity in the UK context may have complexity below average when compared with other geographies.
- 20 Nine largest cities excluding London: Birmingham, Bristol, Glasgow, Leeds, Liverpool, London, Manchester, Newcastle, Nottingham, Sheffield.
- 21 See Figure 12 (Appendix 1) for further details.
- 22 An economic trend described by Moretti as 'the Great Divergence' where the geographical clustering of the most productive companies disproportionately benefits a small number of cities.
- 23 IT-related occupations include "Computer programming, consultancy and related activities" and "Data processing, hosting and related activities; web portals"; and Electronics-related occupations include "Electronic data processing equipment" and "Radio/electronic capital goods".
- 24 Cities ranked by sector's job prevalence, as a share of all exporting jobs.
- 25 Despite its name, 'City Challenge' also covered local authorities that the Centre for Cities does not consider urban areas such as Sefton and Hartlepool. In other cases, the policy targeted peripheral urban local authorities (e.g. Sandwell and Walsall).
- 26 Those cities are Oxford with 24.9 per cent of exporting jobs in Motor vehicle bodies; Crawley with 23.8 per cent of exporting jobs in Air transport; and Peterborough with 25.1 per cent of exporting jobs in Internal combustion engines. The activities they specialized in do not seem to be reason why these cities were able to remain complex as some low complexity cities had competitive advantages in the same sectors (e.g. Luton).
- 27 This is echoed in existing research. Moretti's 'The New Geography of Jobs' (2012) explains the problems caused by the heavily dependence on manufacturing in cities

like Detroit (page 75), and shows how the most sophisticated technologies become more common and less value with time (page 82).

- 28** Commander S (2018), One-company towns: Scale and consequences, IZA World of Labour; The term resource curse was first used by Richard Auty in 1993 to describe how resource-rich countries tended to be relatively poor. Today, the IMF considers a nation 'resource-rich' if at least 20 per cent of exports or fiscal revenue is derived from 'non-renewable natural resources'. Aunty R (1993), Economic and Political Reform in Developing Countries: Economic Development and the Resource Curse Thesis (page 58 to 80).
- 29** See Centre for Cities' blog 'Does Nissan provide a model for levelling up?' at <https://www.centreforcities.org/blog/does-nissan-provide-a-model-for-levelling-up/>
- 30** Followed by manufacturing activities like other glass products; mechanical lifting/handling equipment and active components/sub-assemblies.
- 31** Clayton N & Mandair R, (2014) Cities Outlook 1901, London: Centre for Cities
- 32** Swinney, P (2021), So you want to level up? London: Centre for Cities.
- 33** Northern Research Group of Tory MPs call on Boris Johnson to 'show the North some love' and help create a 'science and engineering corridor', Yorkshire Post, 13th July 2021
- 34** The Prime Minister's Levelling Up speech: 15 July 2021  
<https://www.gov.uk/government/speeches/the-prime-ministers-levelling-up-speech-15-july-2021>
- 35** Breach, A (2021), Why levelling up requires planning reform, Centre for Cities  
<https://www.centreforcities.org/blog/why-levelling-up-requires-planning-reform/>
- 36** Swinney, P (2021), So you want to level up?, London: Centre for Cities.

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