**Economic Complexity and Levelling up**

1. **Executive Summary**

Cities offer a number of inherent benefits to more knowledge-based forms of economic activity. The most successful ones offer access to large numbers of high-skilled workers, and they provide greater opportunity to create and share knowledge face-to-face.

Economic complexity is an analytical approach that attempts to measure how sophisticated an economy is. It 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 shows that because of the inherent advantages that cities have, they are more complex. The UK’s most knowledge-based activities tend to cluster within its urban areas.

Cities’ size plays a role in its complexity levels. Larger cities tend to be more complex than its smaller peers. That said, high complexity in large cities outside the South of England still does not reflect into higher productivity levels. This suggests those cities are the ones with the largest ‘productivity gap’, as shown in previous Centre for Cities’ briefing on levelling up. Moreover, UK’s largest cities – with the exception of London – currently lag its’ French and German competitors, which highlights the need of continuing improving its economic structure.

This static picture hides what has been an improving picture for the big cities over the last 40 years. Applying the economic complexity approach for the first time to historical data in the UK, this briefing shows that the big cities have started to close the gap between their actual and potential performance. In 1981, the largest cities outside the South of England had complexity levels below average. But since then, some of these places were able to break out of its ‘low knowledge’ trap to attract in more knowledge-based activities.

Some argue that this turnaround has been policy driven, with a bias shown towards big cities at the cost to other parts of the UK. Looking back at the whole range of policy interventions since then, it is difficult to see any favouring through policy. Instead, as the UK economy has specialised in more knowledge-based activities over this period as a result of increasing globalisation, big cities have been best placed to take advantage of this change as such activities looked for particular things from their location of choice.

But clearly there is work to be done. Despite their improvement, the continued underperformance of the UK’s large cities creates a cost to the UK economy that the Centre for Cities estimates is at least £47 billion per year. In order for the UK economy to get the most out of what is has, there needs to be greater focus on the performance of large cities, particularly if the Government wants to level up the economy.

This research also offers a note of caution for those who urge areas to ‘play to their strengths’ when attempting to improve their economies. Those cities that have continued to specialise in similar types of activities such as Blackpool in aero spatial activities, are the ones that have become less complex in recent years. This suggests that in many struggling places, it is not what a place has that should be the only question asked, but rather what a place doesn’t have. Many places in North and Midlands won’t see a turnaround in the coming years if they continue to focus on what they already have, particularly in manufacturing. They need to focus on addressing the barriers that stop more complex activities from investing in their areas.

1. **Introduction**

This autumn the Government will publish its Levelling Up White Paper, which will set out how it intends to deliver on a slogan 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 strategy for delivering and a well-defined purpose has meant that policy so far has been boiled down to ad-hoc pots of money and symbolic prizes for some areas, such as the Levelling Up Fund and freeports. These actions have not matched up the Government’s stated ambition in its recent Plan for Growth to have one internationally competitive city per region.

The Centre for Cities recently defined what levelling up should aim and highlighted the role of boosting productivity levels in urban areas to achieve this policy objective. [[1]](#footnote-1) The UK’s poor productivity in the last decades presents a clear geography, with large cities located outside the South East lagging the most.[[2]](#footnote-2)

This briefing shows why some cities and large towns have been more successful than others in the last four decades; and how different urban areas have evolved over time, by analysing historical data on cities’ competitive advantages. Finally, it highlights which places are in a better position to become an internationally competitive city and provides guidance on how Government should act and what to expect from different places.

**Box 1: Methodology**

**Definition of a city**

Centre for Cities research focuses on the UK’s 63 largest towns and cities. Unless otherwise stated, here cities refer to Primary Urban Areas (PUAs), using a measure of the built-up area of a large city or town, rather than administrative boundaries like local authorities or combined authority geographies. Due to data availability, Belfast is not included in the report

**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) and employment numbers from BRES.

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

1. **What is economic complexity and how it looks today in UK urban areas**

**What is economic complexity?**

Places have different characteristics – such as infrastructure, land availability or labour force’s knowledge – which will determine its economic structure and respective productivity. In order to understand these differences, the economic complexity theory infers the economic capabilities of a place, based on its’ comparative advantages and accumulated knowledge levels. Such approach considers the mix of economic activities a place holds a competitive advantage (Box 2 for further details and methodology).[[3]](#footnote-3)

According to the theory, as individuals are limited in what they can know and produce, new industries emerge as result of the accumulated knowledge in an economy. For example, it is easier to move from computer software development to smartphone app development, say, than it is to go from shirt production to app development, as consequence of the inherent knowledge of those activities.

The most productive economies tend to have large levels of accumulated knowledge, which allow them to benefit substantially from the transmission of tacit knowledge and innovate in the future. Meanwhile, places with comparatively low levels of complexity often specialise in activities that do not require a strong base of knowledge. Consequently, those places are less likely to generate vast webs of knowledge within their economies, which would drive new innovations and growth.

**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 in a product is higher than the product’s weight in overall world trade. **[[4]](#footnote-4)**

**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 as how diverse (how many products it has a specialisation) they are; and how ubiquitous (number of places that are able to make a product) are their areas of specialisation.[[5]](#footnote-5) As result – by interacting diversity and ubiquity – it is possible to assign an Economic Complexity Indicator (ECI) for each geography and Product Complex Indicator (PCI) for each economic activity.

**A rare activity is not necessarily a complex one**

The economic complexity concept, by comparing activities across geographies, is able to identify complex and non-complex activities within equally rare activities. For instance, a product that is rare only because of its’ geography (like diamonds and oil) is likely to be located in a place that produces several non-rare (high ubiquity) goods. On the opposite spectrum, a rare and complex activities is usually bundled next to other rare (low ubiquity) products, suggesting the product requires a certain level of accumulated knowledge to be produced.

**Economic complexity at the urban level**

Over the last years, economic complexity has been applied at the urban level in several countries like the UK (Mealy and Coyle, 2019) and US (Fritz and Manduca, 2019).[[6]](#footnote-6)Unlike cross-country comparisons, revealed comparative advantages are measured using employment data, instead of international trade data.A city or town has a RCA in an economic sector if its’ employment share is above the overall average.

**For the purpose of this paper, we measure economic complexity based on exporting activities** because they are not tied to a local market, these exporters could, in theory, locate anywhere in Britain based on its competitive advantages.**[[7]](#footnote-7)** Moreover, economic complexity for Britain as a whole considers all local authorities separately; while urban economic complexity solely covers the 62 urban areas defined by the Centre for Cities as cities or large towns.[[8]](#footnote-8)[[9]](#footnote-9)

**What are exporting businesses?**

Exporting businesses (also known as business to business (B2B) or tradable businesses) sell to regional, national or international markets. They form the export base of the local economy. The markets these businesses sell to do not tie them to a specific location, and so long as they can easily access their target market, they are free to set up wherever they want. But given the different requirements of goods (e.g. car manufacturers) and services (e.g. computer programming) exporters, their location decisions are likely to look very different. For this research we have defined exporters and local services firms using Standard Industrial Classification (SIC) codes.

Different places have distinct inherent benefits and costs for businesses, which impacts where businesses decide to locate. Broadly, cities and large towns – through densification – provide access to workers, access to customers and access to knowledge through the face-to-face interactions that city centres in particular encourage.

Such underlying features are especially attractive for knowledge-based service activities, promoting knowledge spillovers, which increase accumulated knowledge of a place and its’ respective complexity. This idea is supported by the economic complexity indicator (ECI) for British local authorities. Urban local authorities are, on aggregate, substantially more complex than non-urban areas in 2019, as Figure 1 illustrates. By being places with higher accumulated knowledge, cities are Britain’s engine of growth: 62 largest cities and towns in Britain account for 9 per cent of land, but 59 per cent of jobs and 71 per cent of knowledge-based services jobs.

**Figure 1: Urban areas are more likely to be complex than non-urban areas, result of their inherent advantages**

Source: BRES, 2019. Centre for Cities’ own calculations.[[10]](#footnote-10)

**Box 3: How agglomeration affects the location of businesses within cities**

Agglomeration is the process by which concentrating economic activity in one place increases the productivity of that activity. Benefits are characterised into three types: learning, which reflects the ability to share ideas and information; sharing, the sharing of inputs such as roads and broadband; and matching, the matching of workers to jobs and jobs to workers.[[11]](#footnote-11)

These benefits of agglomeration play out over very different geographies.

- 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]](#footnote-12)

- The ability to exchange ideas and information, known as ‘knowledge spillovers’ tends to operate over very small geographies. 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.[[13]](#footnote-13)

On the latter, this is why we see much activity – and high-skilled activity in particular – locate within city centres. 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.[[14]](#footnote-14)

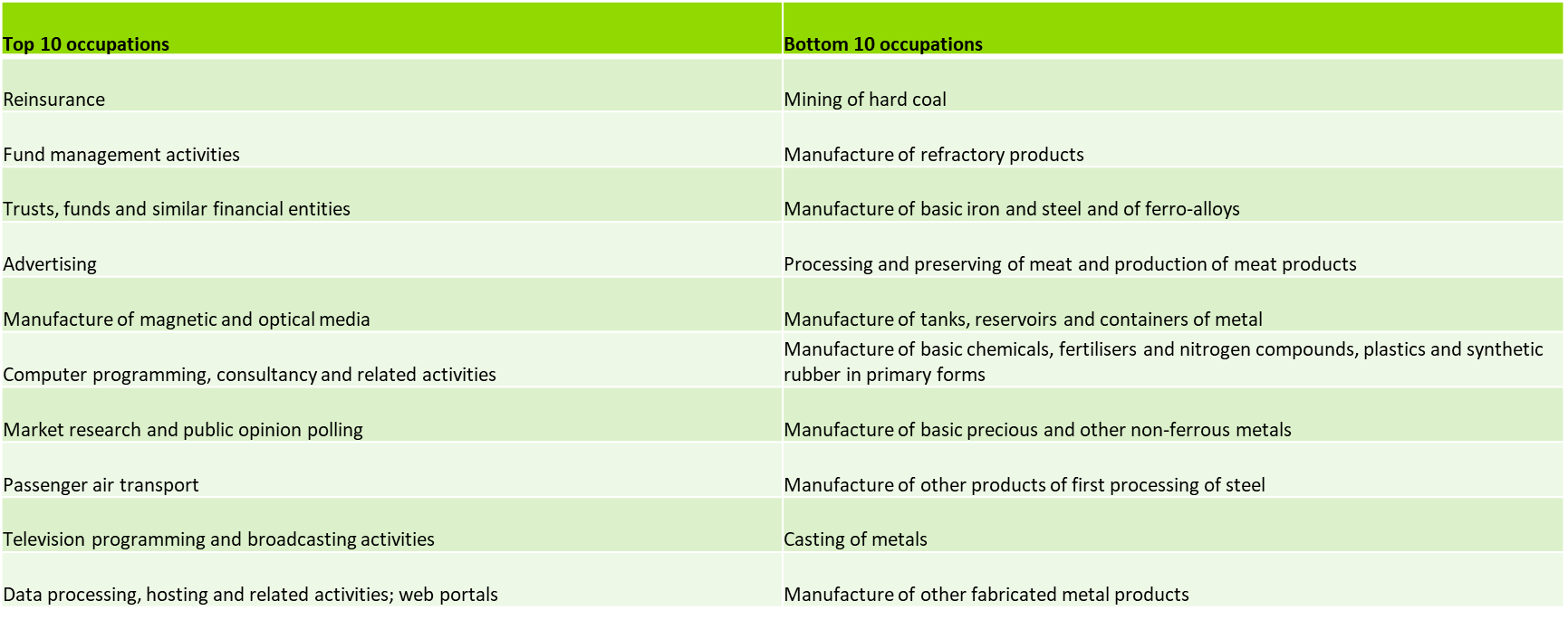
The firms most influenced by agglomeration are ‘exporting’ businesses – those that sell to regional, national and international markets. Because they sell to so many markets, they are more likely to choose their location based on the benefits and costs set out above.

The location of local services businesses, on the other hand (such as hairdressers and restaurants), is instead governed by where their customer base is located. Their location decisions are much less likely to be directly influenced by agglomeration, and more by centres of population.

It is exporter businesses, and high-skilled ones in particular, that are crucial for determining productivity because of their ability to absorb new innovations. That means that its ability to attract or grow its exporting base determines the overall productivity performance of a city.

Today, the most complex occupations (defined solely by exporting sectors, see Box 2 for further details) are typically associated with knowledge-based services, such as finance-related, advertising and programming occupations. Meanwhile, manufacturing and mining jobs rank among the least complex activities in Britain (Table 1). This reinforces the idea that the ability of accumulating knowledge, mostly prevalent in urban areas, drives economic growth. Additionally, it supports previous research from the Centre for Cities that shows service exporters (more likely to be complex) frequently locate in cities, particularly in city centres, where they can benefit from agglomeration. While exporters of goods, which Table 1 shows they tend to be less complex, are more likely to be in suburbs or non-urban areas because land and premises are cheaper. [[15]](#footnote-15)

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



Source: BRES, 2019. Centre for Cities’ own calculations.

**Urban areas are not equally complex**

Even though cities and large towns are Britain’s engine of growth, they have diverse levels of complexity; with some urban local authorities perform below the non-urban average.[[16]](#footnote-16) Productivity differences across Britain’s urban areas are mainly result of their economic structure, rather than underperformance of existing businesses, or lack of exporting jobs in struggling cities. [[17]](#footnote-17) Figure 2 illustrates this relation: the least productive cities and large towns have competitive advantages in low complexity sectors (e.g. mining, warehousing, etc.), which intrinsically are low productivity, when compared with knowledge-based services.

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

**Urban average**

Source: ONS 2021; BRES, 2019. Centre for Cities’ own calculations.

There is a clear geography in Britain’s economic complexity. Most of cities and large towns that have simultaneously high complexity and productivity are located in the Greater South East. As previous Centre for Cities’ research has shown, highly-skilled exporters – which tend to be more productive– are predominant in that region because cities have been able to offer both a large number of skilled labour force and networks of other highly–skilled businesses. In order to access those advantages and the accumulated knowledge associated with them, highly productive firms are willing to pay a premium, in the form of more expensive commercial space. [[18]](#footnote-18)

Most of the Britain’s urban areas with complexity below average, also have comparatively low productivity. These cities and large towns are generally located in the North and Midlands, where their competitive advantages, such as distribution, warehousing and storage, usually require cheap pools of labour and low-cost land. Due to their underlying features, those economic activities are unlikely to promote knowledge spillovers and therefore increase the accumulated knowledge of these areas.

**Most big cities are punching below their weight**

As cities are places that offer access to large pools of workers and networks of businesses, a link between cities’ size (a proxy of the agglomeration benefits they are able to offer) and its’ complexity should be expected. This broadly holds in Britain’s urban context, as Figure 3 illustrates: larger cities are more likely to have a complex economy than its smaller peers.

**Figure 3:** Big cities promote higher benefits from agglomeration, promoting complex sectors

Source: ONS, Business Register and Employment Survey (BRES); ONS, Census 2011. Centre for Cities’ own calculations.

Nevertheless, most of Britain’s largest cities – the ones like Glasgow, Manchester, Liverpool and Leeds – **have productivity below average, despite being comparatively complex economies,** as Figure 2 suggests.The mismatch between overall productivity and respective complexity highlights that **big cities in Britain are the ones with the largest ’productivity gap’ to be closed**. These cities hold competitive advantages in sectors associated with high levels of knowledge and productivity; However, they have not been able to fully benefit from them.

The recent Centre for Cities’ levelling up briefing shows that the existing ‘productivity gap’ in UK’s economy is mostly driven by its biggest cities outside London. It is conservatively estimated at £47 billion per year. [[19]](#footnote-19)

**The ‘productivity gap’ is result of a small complex base: making the biggest cities lagging their international competitors**

The observed underperformance of Britain’s largest cities is partially explained by the relatively small size of the sectors that make those cities complex. Currently, most large cities have competitive advantages in some complex activities. However, those sectors employ a comparatively low level of workers, when compared with other complex economies (Figure 4). As consequence, large cities’ most complex activities – and therefore most productive – are not large enough to drive productivity upwards.

For example, Glasgow and Brighton are similarly complex but their productivity substantially differs, which is partially driven by the size of its’ complex activities. Brighton, a city which is highly productive, have 54 per cent of its exporting jobs in its’ most complex activities. Meanwhile, in Glasgow – which has productivity below national average – only 13 per cent of its exporting jobs come from its most complex activities.[[20]](#footnote-20)

**Figure 4:** Complex places with low productivity, generally big cities, lack a large complex export base

Source: ONS, Business Register and Employment Survey (BRES). Centre for Cities’ own calculations.

That said, the comparatively high levels of complexity of most big cities do not hold at the international level. Previous Centre for Cities’ research shows that the main difference between urban Britain and cities in France, Germany and the US is that as a group, productivity in larger cities in Britain lags the national average, rather than leading it. [[21]](#footnote-21) This is supported by economic complexity at the cross-country level.

When compared with French and German urban areas, Britain’s biggest cities (excluding London), substantially underperform cities with a similar size, as Figure 5 illustrates. From the eighteen large cities analysed in both France and Germany, all had complexity above average, compared with three (Bristol, Leeds and Manchester) out of nine British cities under analysis.[[22]](#footnote-22) Smaller cities and towns in Britain have, on average, lower complexity scores than its’ French peers but the existing gap is comparatively small when compared with larger urban areas.

**Figure 5:** Big cities significantly lag their German and French competitors[[23]](#footnote-23)

Source: ONS (BRES) 2019, INSEE (2018) and Destatis (2019).

In terms of levelling up productivity, the aim of policy should be to help places to achieve their productivity potential, which will differ from place to place, rather than trying to get every place to achieve the same level of productivity. The underperformance of UK’s biggest cities must be dealt in order to level up the country and European counterparts suggest that closing the ‘productivity gap’ is feasible.

1. **The last four decades of economic complexity (1981-2019)**

**Urban areas and large cities in particular have been diverging**

Analysing the last four decades helps understand the reasons behind the current “productivity gap” in several British cities. As the economy has been moving from manufacturing towards knowledge-intensive services, urban areas in general and the largest cities in particular, are in a better position to prosper. Urban areas – specially the larger ones – offer benefits that promote innovation, knowledge spillovers and consequently become complex and productive in today’s economy.

**Figure 6:** Cities, in particular the largest ones, have become more relevant in the last four decades

Source: ONS 2018; Census, 1981; BRES, 2019. Centre for Cities’ own 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.

**Largest cities include:** Birmingham; Manchester; Glasgow; Liverpool; Sheffield; Newcastle; Leeds; Nottingham; Bristol.

**Past complexity is a good predictor of today’s complexity and productivity**

* The strong relationship between 1981 and 2019 complexity levels support the ideas that the past knowledge/capabilities of a city help explain its future performance. The cities that had high complexity levels in 1981 were more likely to have the necessary collective knowledge to keep innovating and remain complex and highly productive, as Figure 7 illustrates.

**Figure 7:** Complexity changes 1981-2019, at the PUA level

Source: ONS 2018; Census, 1981; BRES, 2019. Centre for Cities’ own calculations. Note that complexity scores are relative to other cities, meaning that there will always be cities with negative scores. Scores are normalised.

* + Box 4 with a bit of data and methodology for 1981
* That said, complex economies remained productive not by replicating the existing advantages they had in 1981. Evidence shows that cities, which have been historically creators of knowledge, tend to have greater transferable skills.[[24]](#footnote-24) Those urban economies kept reinventing themselves, adapting to the changes in the economy and developed advantages in new economic sectors like IT (more details, see Box 5).

Box 5: London’s growth and the role of the financial sector

The rise of London in the last decades is generally associated with the “Big Bang”, a set of financial deregulation reforms by the mid-80s that lead to the expansion of the financial sector. However, London’s economic turnaround has been much more than finance.

• The rise in finance happened in a context of an overall economic shift towards the service sector. When compared with other knowledge and business services, London’s rise of finance-related jobs was dwarfed by sectors like programming, design, advisement or research.[[25]](#footnote-25)

**Figure 8**: Finance-related employment rose but not as much as other services.

Source: Census, 1981; BRES, 2019

• Moreover, national accounts from the last two decades also support the idea that finance and insurance sector has not been the main driver of London’s growth. The sector, as a percentage of London’s economy, remained mostly unchanged. While Information and Communication; combined with Professional, scientific and technical activities have risen significantly, partially being the driver of London’s growth in the last decades. In 2019, those sectors presented 25.1 per cent of London’s economy, a 8.9 percentage points increase when compared with 1998. Moreover, their weights are substantially above the finance and insurance sector, that stood at 13.7 per cent in 2019.

**Some places, mainly large cities, were able to become more complex and attract new innovative sectors**

* The few places that were able to **break out of the ‘low complexity’ trap and attract in more complex activities are large cities**, with the exception of Dundee and Warrington. As Box 6 suggests, those cities were able to attract new knowledge activities, without necessarily having previous knowledge on that specific sector.
* These findings highlight that large cities, with their agglomeration benefits, are in the best position to attract knowledge-related sectors.

**Box 6:** Cities can develop sectors without previous knowledge in relatable areas

Some British cities were able to become relatively more complex recently, specialized in new activities in the last decades. Data at the occupational level suggests that in some circumstances, the observed improvements did not depend on the previous industrial features of a place.

**Computer-related sectors**

Today, economies with a strong IT sector generally had a comparative advantage in electronics-related occupations in 1981 (Figure 10); both sectors are seen as complex in 2019 and 1981, respectively. Half of the cities with a comparative advantage in the IT sector – like Reading, Slough, London or Brighton – were specialised in the electronics sector in 1981. Nevertheless, Leeds and Nottingham were able to become some of the few cities with a comparative advantage in IT, without having electronics’ legacy from 1981: Nottingham ranked 37th out of 62 cities in terms of being specialised in electronics.

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

Source: ONS 2018; Census, 1981; BRES, 2019. 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”.

A similar trend is found in Research-related activities, one of the most complex sectors today. Liverpool was able to build a comparative advantage in that sector, without presenting a strong legacy, as it ranked 49th out of 63 cities in Research and Development activities in 1983.[[26]](#footnote-26) Moreover, Manchester, Nottingham and Slough were some of the least specialised economies in the ‘Telecommunications’ in 1981 and today they present a comparative advantage in ‘Wireless telecommunications activities’.

* Despite the improvements in the last decades, UK’s large cities continue underperforming relative to its size, both in national and international terms. As highlighted in previous Centre for Cities’ levelling-up briefing those places should be in centre of governments’ levelling-up agenda, in order to unleash UK’s productivity potential.[[27]](#footnote-27)

**The emergence of larger cities is not result of direct policy towards cities but structural changes in the global economy**

* There is also a strand of thought that cities have ‘had it too good’, and have been explicitly favoured by policy in recent decades. This has sucked jobs into cities, so the argument goes. Finding evidence of this is difficult. There have been city specific policies, such as Michael Heseltine’s City Challenge or City Deals under the Cameron-led government. But as *Box 3* illustrates, in the wide gamut of local growth policies that have been put in place in the last 30 years, very few have been city focussed.
* **Box 3: 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.
* 1991 City Challenge
* 198x Enterprise Zones
* 1999 Coalfield Regeneration Trust
* 1997 Single Regeneration Budget
* 1998 Regional Development Agencies
* Xxxx Local Enterprise Growth Initiative
* Xxxx Pathfinders?
* 1998(?) New Deal for Communities
* Xxxx Coastal Communities Fund
* 2011 Local Enterprise Partnerships
* 2014 Local Growth Fund
* 2012 Enterprise zones
* 2011 City Deals
* 2009-18 Mayoral Devolution Deals
* 2019 Towns Fund
* 2019 Future High streets fund

* Other non-spatial policies have inadvertently helped cities. The expansion of higher education has seen the growth of universities that are largely city based. While immigration policy has also benefited London in particular.
* But the main driver has been global economic forces that have altered the geography of the UK economy. Skills-biased technological change and a shift to an ever more services-based economy has changed the nature of firms in the national economy. These businesses have different locational preferences to those of the past, looking for the benefits that density provides. And these benefits have seemingly become increasingly desirable despite advances in communications technologies.

**Promoting existing advantages in struggling cities is unlikely to turn things around**

* Places that experience a relative decline in economic complexity – unlike the ones that were able to remain complex – typically kept specialising in their 1981’s comparative advantages. As the economy evolved over the decades, those cities have struggled as their economic structure remained relatively unchanged and global economy kept innovating.
* Highly productivity cities like Reading and Edinburgh moved from being specialised in electronic-related activities in 1981 to IT-related jobs in 2019, innovation allowed them to remain productive over the decades. Meanwhile, Blackpool and Swansea continued replicating the exact same activities they were in 1981 (Aerospace; Iron and Steel, respectively), reflecting in a relative decline of its economic position (see Table 2).

**Table 2:** Reinventors vs. Replicators, most prevalent occupation % of exporting jobs in 1981.

|  |  |  |  |
| --- | --- | --- | --- |
| **PUA** | **1981** | **2019** | **Complexity** |
| 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: Census, 1981; BRES, 2019.

**Overspecialisation in existing competitive advantages limits the future performance of a city**

* Data on job concentration, which acts as a proxy of specialisation in a single sector, shows that specialising in a single sector (manufacturing and extraction in particular) hinders the economic over the long-term. Cities with low complexity today have, on average, high levels of concentration in a single (low sophistication) activity sector in 1981.[[28]](#footnote-28)Economies with low complexity today had, 18.8 per cent of its jobs in a single sector, on average; compared with 11.1 per cent for high complexity economies.

* There is also evidence that cities with the same specialisation in 1981 but different degrees of concentration moved in opposite directions in the decades ahead. Highly concentrated economies, specially in manufacturing and extraction activities, struggled to bring new knowledge-intensive activities, when compared with its peers as Table 3 illustrates.

**Table 3:** Divergence between cities with the same specialisation in 1981 but different degrees of specialisation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **PUA** | **Most prevalent sector (1981)** | **Sectorial concentration: % exporting jobs** | **KIBS % private jobs (1981)** | **KIBS % Private jobs(2019)** | **Most complex activity (2019)** | **Complexity (1981-2019)** |
| Liverpool | Motor vehicle bodies | 10.8 | 7.2 | 12.7 | Data processing, hosting and related activities; web portals | Improved |
| Luton | 16.7 | 4.1 | 10.3 | Passenger air transport | Deteriorated |
| Nottingham | Deep coal mines | 6.8 | 5.2 | 12.6 | Data processing, hosting and related activities; web portals | Improved |
| Mansfield | 26.6 | 3.1 | 6.3 | Photographic activities | Remained low |

Source: ONS 2018; Census, 1981; BRES, 2019. Centre for Cities’ own calculations. Note that complexity scores are relative to other cities, meaning that there will always be cities with negative scores. Scores are normalised.

**‘Playing its own strengths’ means moving from one low complexity activity to another**

* Urban economies ‘trapped’ in low complexity sectors in the last four decades, which are mostly located in the North and Midlands, typically present as competitive advantage large pools of low-cost labour, combined with the availability of cheap land. As consequence, those economies tend to attract low productivity activities that require those features such as warehousing and storage, or food manufacturing.
* If cities and large towns trapped in low complexity activities keep specialising in activities based on their existing strengths, they will continue attracting low productivity and low paid jobs in the years ahead. As illustrated in Box 7, most low of complexity economies simply shifted between different low knowledge-activities in the last four decades. Their inherent strengths will not attract knowledge-related activities. Consequently, they are unlikely to benefit from knowledge spillovers, which would help cities to innovate and reinvent themselves.[[29]](#footnote-29)

**Box 7:** Coal economies – evolution in the last decades

From the 22 cities and large towns that had they complexity level below average for both 1981 and 2019, six of them were highly reliant on coal in 1981. Today, their economies had moved away from coal and become specialised in several different sectors, which typically require cheap labour and land. However, those competitive advantages had no economic relationship with coal mining; which means these economies did not benefit from accumulated knowledge of their previous specialisation.

**Table 4:** Most prevalent exporting occupation, 1981-2019



Source: Census, 1981; BRES, 2019.

This highlight how low complexity activities are unlikely to drive places towards economic sophistication through the gradual development of its existing sector (e.g. moving from mining to mining tool manufacturing, etc.). Instead, cities are likely to continue using their existing competitive advantages to attract new types of low complexity sectors that are unlikely to promote innovation.

**Sunderland’s previous strengths did not attract Nissan**

In 1984, the British government and Nissan reached an agreement to open a car plant in Sunderland and Nissan has been able to benefit from further government support in recent years.[[30]](#footnote-30) Before the car plant, Sunderland’s economy was dominated by coal mining, shipbuilding and other manufacturing activities. However, there is little evidence that Sunderland’s economic structure was the reason why Nissan located there.

If Nissan has moved to Sunderland mainly because of its industrial and labour capabilities, we should expect to see a strong relationship between those sectors (mining, shipbuilding, etc) and car manufacturing in other British cities. Figure 9 suggests that there is no relation between Sunderland’s past capabilities and the likelihood of producing car-related goods.

**Figure 10:** Cities with car manufacturing plants were not similar to Sunderland in the early 80’s

**Source:** Census, 1981; BRES, 2019. **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 and Portsmouth, 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.

Urban economies with some degree of specialisation in car manufacturing today (Luton, Birmingham or Oxford) did not share Sunderland’s economic features in 1981. At the same time, places focused in mining and shipbuilding like Portsmouth or Doncaster did not shift their economy towards car manufacturing. Sunderland was able to attract Nissan due to other benefits that were not directly related to its industrial base like public subsidies; and availability of cheap land and labour.

**What does this mean for levelling up?**

**Recognise the central role of cities in levelling-up the economy**

* Cities are more complex than non-urban economies because the overall economy is moving towards knowledge-intensive services
* Urban economic complexity, like previous CfC research, supports the idea that levelling up is not making all places equally productive.
* Ad-hoc pots of money to towns can improve local wellbeing but not solve the productivity challenges.

**Within cities, different places present different challenges, depending on its economic base**

**Larger cities, with the highest ‘productivity gap’**

* Cities that improved their complexity substantially since 1981, typically large cities that offer agglomeration benefits to knowledge-intensive sectors, are still in a transition process. Unlocking its productivity potential is key to level up the country as whole. Central and local governments must support cities to expand on their emerging strengths.
  + **Central government rec:** End local government austerity, give further devolved power, etc.
  + **Local government rec:** use devolved powers to improve people’s skills; strengthen transport networks; improve conditions for business (office space quality); etc.

**Economies stuck in low complexity activities**

* Central government should not expect these places as a whole to improve their productivity levels rapidly: our research shows that cities that had complexity gains in the last four decades are still lagging in terms of productivity showing how gradual the process can be.

* That said, cities can reinvent themselves and turn things around but not by building on their existing strengths, which keeps cities in a cycle of replication. In order to achieve it, it will fundamental to diversify the existing economy by attracting other sectors. Strategies based on attracting large manufacturing plants or freeports will do little to change the strengths of an economy in the decades to come.
  + **Central government rec:** support incomes and wellbeing in the areas, guarantee health and education levels converge with the rest of the country.
  + **Local government:** make cities better places for businesses (office space improvements) and adult education, etc

1. Swiney, P (2021), So you want to level up?, London: Centre for Cities [↑](#footnote-ref-1)
2. Swiney, P and Breach, A (2017), The role of place in the UK’s productivity problem, London: Centre for Cities [↑](#footnote-ref-2)
3. 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. [↑](#footnote-ref-3)
4. Cesar A. Hidalgo, Ricardo Hausmann (2009) ["The Building Blocks of Economic Complexity](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2705545), Proceedings of the National Academy of Sciences. [↑](#footnote-ref-4)
5. Our economic complexity calculations are based on the ‘Method of Reflections‘ in line with Cesar A. Hidalgo, Ricardo Hausmann (2009) ["The Building Blocks of Economic Complexity](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2705545), Proceedings of the National Academy of Sciences. [↑](#footnote-ref-5)
6. Mealy, Penny and Coyle, Diane (2019) “Economic complexity analysis”: A technical report for the research on Innovation & Global Competitiveness, Manchester: Greater Manchester Independent Prosperity Review & Benedikt S. L. Fritz, Robert A. Manduca (2019) “The Economic Complexity of US Metropolitan Areas” [↑](#footnote-ref-6)
7. Both Mealy, Penny and Coyle, Diane (2019); and Fritz and Manduca (2019) consider both exporters and local services in their Economic Complexity Indicators. That said, as Fritz and Manduca mention, there are several economists who identified the specific importance of exporters to urban economies. [↑](#footnote-ref-7)
8. The decision to exclude non-urban local authorities in the urban ECI calculations results from the fact that non-urban local authorities are likely to include more than one non-urban economy within their boundaries, which may skew the analysis. [↑](#footnote-ref-8)
9. Note that complexity scores are a relative measure between geographies. This means that there will always be places with negative scores. [↑](#footnote-ref-9)
10. 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. [↑](#footnote-ref-10)
11. For example, see Rosenthal S and Strange W (2004), Chapter 49 – Evidence on the Nature and Sources of Agglomeration Economies, Handbook of Regional and Urban Economics, Volume 4, Pages 2119-2171 [↑](#footnote-ref-11)
12. Rice P, Venables AJ and Patacchini E (2006), Spatial Determinants of Productivity: Analysis for the Regions of Great Britain, Regional Science and Urban Economics 36 (6), 727-752. A study on the largest US cities suggests that agglomeration has an effect over a 60 minute drive time, with the majority of the gains concentrated in the first 20 minutes. See Melo P, Graham D, Levinson D and Aarabi S (2015) Agglomeration, accessibility and productivity: Evidence for large metropolitan areas in the US, Urban Studies [↑](#footnote-ref-12)
13. 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 [↑](#footnote-ref-13)
14. Swinney P and Serwicka I (2016), Trading Places: Why firms locate where they do, London: Centre for Cities [↑](#footnote-ref-14)
15. Swinney P and Serwicka I (2016), Trading Places: Why firms locate where they do, London: Centre for Cities [↑](#footnote-ref-15)
16. When analysing economic complexity at the local authority level, it can be found that urban local authorities such as Hull, Telford and Burnley perform below the non-urban weighted average complexity score. Furthermore, there are examples of non-urban local authorities (Bath and North Sommerset; or Windsor and Maidenhead) that perform significantly above the urban average. [↑](#footnote-ref-16)
17. Swinney P (2018): The wrong tail? London: Centre for Cities [↑](#footnote-ref-17)
18. 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. [↑](#footnote-ref-18)
19. Swinney P (2021): So you want to level up? London: Centre for Cities. [↑](#footnote-ref-19)
20. Most complex activities are defined as the five occupations with the highest Product Complexity Index (PCI) for each city. [↑](#footnote-ref-20)
21. Swinney P and Enenkel K (2020), Big cities and levelling up, London: Centre for Cities [↑](#footnote-ref-21)
22. Nine largest cities excluding London: Birmingham, Bristol, Glasgow, Leeds, Liverpool, London, Manchester, Newcastle, Nottingham, Sheffield. [↑](#footnote-ref-22)
23. The Economic Complexity scores are calculated using SIC-2 employment codes for 39 different exporting occupations. The sample include 122 cities and large towns: 63 from Britain, 48 from France and 11 from Germany. Due to data availability, only large German cities are included. [↑](#footnote-ref-23)
24. Add footnote: A century of cities CfC [↑](#footnote-ref-24)
25. **Other knowledge-related services include (2019):** Activities of head offices; Management consultancy activities; Research and experimental development on natural sciences and engineering; Research and experimental development on social sciences and humanities; Advertising; Market research and public opinion polling; Specialised design activities; Photographic activities; Translation and interpretation activities; Other professional, scientific and technical activities n.e.c.; Computer programming, consultancy and related activities; Data processing, hosting and related activities; web portals; Other information service activities.

    **Other knowledge-related services include (1981):** Business services (Other); Advertising; Professional/technical services (Other); Research/development [↑](#footnote-ref-25)
26. Ranked by sector’s jobs as percentage of all exporting jobs [↑](#footnote-ref-26)
27. Paul’s briefing here [↑](#footnote-ref-27)
28. Moretti mentions something similar to this in the New Geography of Jobs when he speaks about Detroit and the Valley. The sophisticated sectors of the present will be lower sophistication in the future, so invest in them is not the best strategy. [↑](#footnote-ref-28)
29. Graham D (2007) Agglomeration Economies and Transport Investment, Journal of Transport Economics and Policy 41 (3) [↑](#footnote-ref-29)
30. Is your blog enough as reference about the subsidies? [↑](#footnote-ref-30)